ENERGY AUDIT REPORT

GODAVARI FOUNDATION'S

DR ULHAS PATIL MEDICAL COLLEGE AND HOSPITAL

NH-6, BHUSAWAL ROAD, JALGAON

MAHARASHTRA 425309

Phone No: 0257-2366678

E-mail Id: principal@poonacollege.edu.in

Website: https://www.dupmc.ac.in/

Conducted and Submitted by

ENERFUTURE TECHNOLOGY PRIVATE LIMITED

301, Above Ekbote Hospital,

Revenue Colony, J.M.Road,

Pune-411005

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ENERFUTURE

CERTIFICATE

ENERFUTURE TECHNOLOGY PRIVATE LIMITED

Verified and Certified that

GODAVARI FOUNDATION'S

DR ULHAS PATIL MEDICAL COLLEGE AND HOSPITAL

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has carried out

Energy Audit

as per guidelines laid down in the
Energy Conservation Act, 2001,
Ministry of Power, Government of India
in 2019-20.

ENERFUTURE TECHNOLOGY PRIVATE LIMITED ★ PUNE ★

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LLB, ADIS
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BEE, EA-22697

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ENERFUTURE

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ACKNOWLEDGEMENT

Enerfuture thanks the management of Dr Ulhas Patil Medical College and Hospital, Jalgaon for assigning this important work of Energy Audit of Dr Ulhas Patil Medical College and Hospital, Jalgaon

Energy Audit study is a joint venture exercise of consultant and college account and contain energy usage without sacrificing the purpose of energy use.

Contribution of college's team is equally important in this venture. Team of technical experts from Enrfuture Technology Pvt Ltd is grateful to all the following personnel of Dr Ulhas Patil Medical College and Hospital, Jalgaon for their kind cooperation, furnishing required data, analysis report and support offered during our visit.

Name	Designation
Dr. Ulhas V Patil	Chairman
Prof Dr. N. S. Arvikar	Dean
Mr. Pramod Bhirud	Registrar
Prof Dr. Bapurao M. Bite	Assistant Professor

We are also thankful to the other staff members who were actively involved while taking measurements and conducting field study.

STUDY TEAM

Sr No	Name	Qualification
1	Mr. Chetan Nemade	M.Tech (Energy Studies), Advance Diploma in Industrial Safety (ADIS), LLB, BEE Certified Energy Manager
2	Mr Vinay Mulay	M.Tech (Energy Studies), ISO 50001 Lead Auditor, BEE Accredited Energy Auditor
3	Mr Swapnil Gaikwad	M.Tech (Energy Studies), ISO 50001 Lead Auditor, BEE Certified Energy Auditor
4	Mr YogeshKuwar	M.Tech (Energy Studies), IGBC IGBC Accredited Professional, Post Graduate Diploma in Environmental law and Policy (PGDELP), BEE Certified Energy Manager
5	Mr Prasad Kalal	B.E Electrical, BE (Electrical), Electrical Supervisor(51242), Electrical Contractor(37364)

LIST OF INSTRUMENTS USED

1. Single Phase Power Analyzer
2. Ultrasonic Water Flow meter
3. Distance Meter (Bosch)
4. Lux meter (Meco)
5. TD meter
6. CO2 meter
7. Air quality measure meter
8. Sound meter

CONTENTS

EXCECUTIVE SUMMARY

Sr no	Location	Area	Proposed Action	Expected Result	Saving Potential	Monetary Saving	Investment	Simple Payback Period
				monthly	kWh	INR	INR	months
1	College building and others	Lightning recommendations	Replace existing old conventional 1x36W with new energy efficient 1x18W LED tube light battens	Existing lighting consumption= 13249.22kWh Expected energy consumption= 8809.31kWh Total energy saved per month=4439.91kWh	4439.91	58,162.82	2,57,690	4.43
2	College building and others	Fan recommendations	Replace existing old conventional fans which consumes 65W with new energy efficient fans which consumes 28W(18W & 8W for exhaust fan)	Existing fan consumption= 3434.2kWh Expected energy consumption= 1373.68kWh Total energy saved per month=2060.52kWh	2060.52	26,992.81	5,09,400	18.87
3	Electricity bills	Electricity duty	As per Maharashtra electricity duty act-1948 and revised-2016 electricity duty is exempted for colleges, its hostels etc	Average monthly electricity duty =INR 4,70,000	-	4,70,000	-	-

		Contract demand	Increase the contract demand from 518KVA to 600KVA	Average excess demand charges saved =INR 23,000	-	23,000	10,000	2.3
4	College building and others	Water pumping system	Replace all old less energy efficient (46.5%) pumps with new energy efficient pumps. Optimise the existing water pumping distribution system.	Existing fan consumption= 7505kWh Expected energy consumption= 5253.50kWh Total energy saved per month=2251.50kWh	2251.50	29,494.65	10,00,000	34
5	Hospital	VRV cooling system	Convert existing VRV system in to the Solar Thermal cooling system	Existing fan consumption= 23266.62kWh Expected energy consumption= 16286.63kWh Total energy saved per month=6979.99kWh	6979.99	91,437.82	20,00,000	21.87
6	Available rooftop on various buildings	Solar PV system	Can be installed 318 kWp system		35795	4,68,920.5	1,43,18,182	30.53

COLLEGE INTRODUCTION

INTRODUCTION

Dr. Ulhas Patil Medical College & Hospital (DUPMC) was started by Godavari Foundation in 2008 to impart quality education in the field of Medical Science. This is one of the flagship institutions of the Godavari Foundation. It started functioning from the academic year 2008-09. The College is recognized by Medical Council of India & is affiliated to Maharashtra University of Health Sciences (MUHS), Nashik. It is the first medical college to be located in Jalgaon District & is spread over an area of Over 33 acres. The Present Premise comprises of College Building, Teaching Hospital Building of 500 Bed Capacity, Staff Quarters, and Separate Hostels for Boys & Girls, Play Ground, Library, Canteen & other amenities.

Each Department consists of a well-qualified staff, well equipped Practical 7 Research Laboratories, well set up Museums with catalogues, Dissection Hall of Anatomy Department & Demonstration Room. College also has 4 Lecture Halls with required Audio-Visual facilities. A resourceful Central Library including E-Library too is open 24*7 for Staff & Students. The Various Special features of the institute make it a Quality Institute.

A Core team of experienced and qualified faculty bears the responsibility to impart knowledge to aspiring students in DUPMC. Interaction with eminent personalities of the Medical Field is a continuous activity at the DUPMC. In addition to giving them value-added skills, the DUPMC provides the students with a solid foundation to base their Medical practical knowledge on. It endows the students with Advanced & Updated Medical skills.

The Godavari Foundation has since its inception built a formidable name in the field of Medical, Para- Medical, Science, Engineering, Management, Agriculture, Primary-Secondary education, Law & other education. The Board of the Management of the Society consist of a group of selfless, dedicated and hardworking educationists whose endeavor in providing & establishing good professional education to the students has been a relentless effort on their part. The Management is headed by a person like Hon.Dr.Ulhas Patil whose missionary zeal in the spread of education has been acknowledged by the society.

Jalgaon is developing as a decent city with district headquarter, is famous all over India as the center of foremost banana growing area. It has recently acquired the fame as "GOLD CITY" for heavy gold trading.

VISSION

Our Vision is to produce quality health care professionals and to promote excellence in health care. Dr.Ulhas Patil Medical College & Hospital, Jalgaon will seek to be a center of excellence in Medical Education, Research and Healthcare Services at the National and International Level.

MISSION

Our Mission is to impart excellent education opportunities for the students of health care profession. The institute in pursuit of its vision will provide outstanding educational experience, in all the disciplines of Medicine and allied Health Sciences, in a supportive environment of scholarship, research, integrity, critical thinking and self-directed learning. It will provide comprehensive, culturally sensitive, community oriented Health care to individuals and families.

AFFILIATION

Dr.Ulhas Patil Medical College & Hospital, Jalgaon

Recognized by Medical Council of India, New Delhi.

Affiliated to Maharashtra University of Health Sciences, Nashik.

PARTICULARS OF AFFILIATED UNIVERSITY VICE CHANCELLOR & REGISTRAR :

Item	Vice Chancellor	Registrar
Name	Prof. Dr. Deelip Mhaisekar Hon'ble Vice-Chancellor	Dr. K.D. Chavan
University	Maharashtra University of Health Science	
State	Maharashtra	Maharashtra
Pin Code	422004	422004
Phone (Off) (Res) (Fax)	 0253- 2539114 0253- 2539113	 0253- 2539292 0253- 2539295
Mobile No.		
E.mail:	vc@muhsnashik.com	registrar@muhsnashik.com

INFRASTRUCTURE

Infrastructure			
Land & Building			
Sr.No.	**Particulars**	**Description**	**Qty**
1	Land Area		35 Acar
2	Build Up Area		59786.58 sq.mt
3	Play Ground/Sports/Games area		
Learning/Teaching			
Sr.No.	**Particulars**	**Description**	**Qty**
1	No. of Class rooms		5
2	No. of Laboratories		13
3	No. of Seminar Halls(Rooms)		2
4	No. of Conference rooms		1
5	No. of Committee Rooms		8

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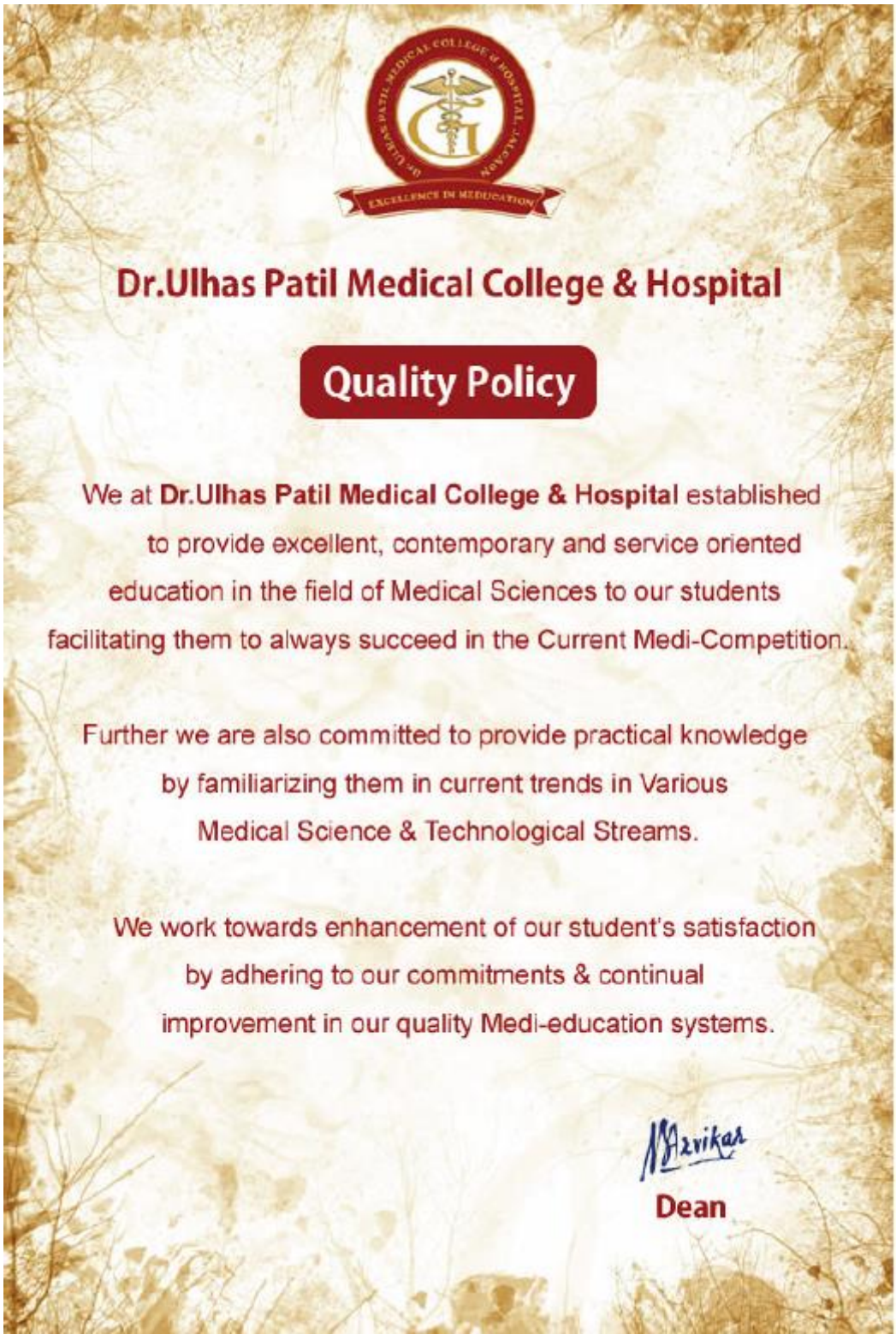
Teaching Tools, AIDS & Sports			
Sr.No.	**Particulars**	**Description**	**Qty**
1	No. of Televisions		30
2	No. of OHPs		15
3	No. of LCDs		60
4	No. of VCP/VCR		
5	Auditorium	Gallary	1
6	Gymnasium		1
7	Sports Play Ground	Green Lawn	1

QUALITY POLICY



Dr.Ulhas Patil Medical College & Hospital

Quality Policy

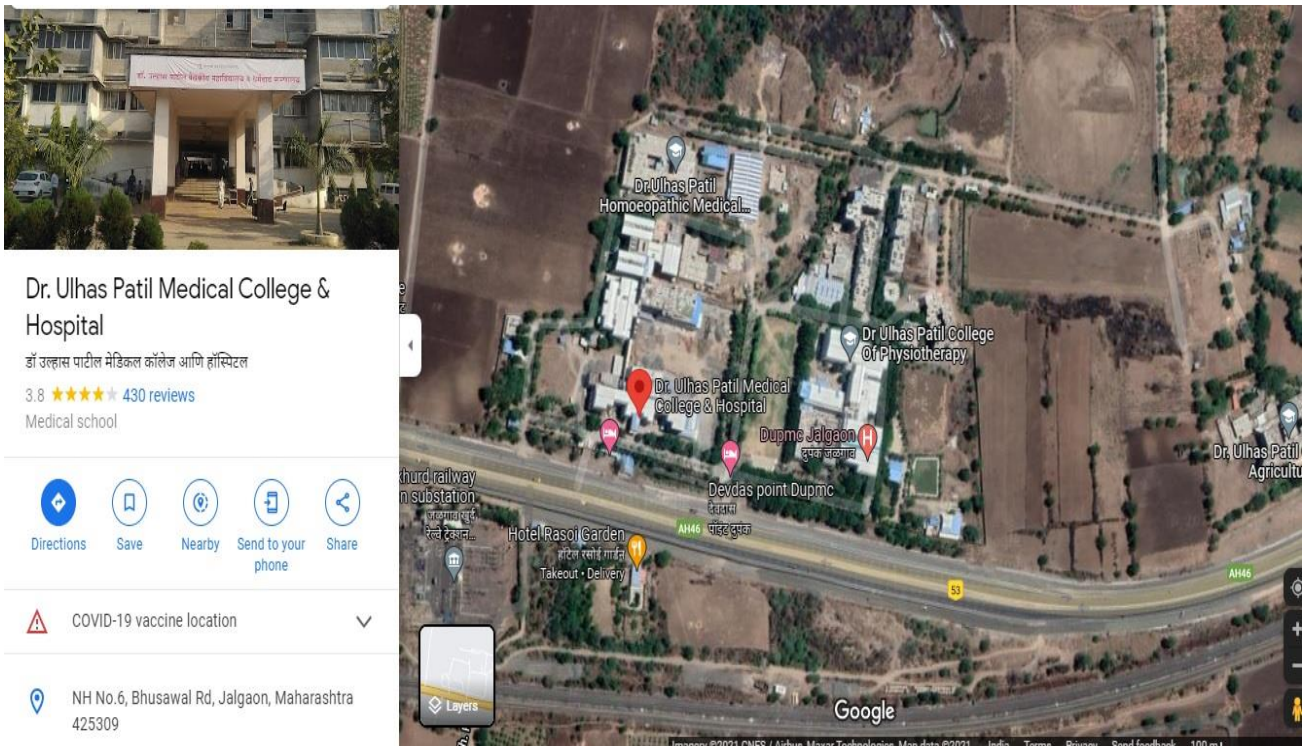
We at **Dr.Ulhas Patil Medical College & Hospital** established to provide excellent, contemporary and service oriented education in the field of Medical Sciences to our students facilitating them to always succeed in the Current Medi-Competition.

Further we are also committed to provide practical knowledge by familiarizing them in current trends in Various Medical Science & Technological Streams.

We work towards enhancement of our student's satisfaction by adhering to our commitments & continual improvement in our quality Medi-education systems.

Dean

LOCATION


Dr. Ulhas Patil Medical College & Hospital
डॉ उल्हास पाटील मेडिकल कॉलेज आणि हॉस्पिटल
3.8 430 reviews
Medical school
Directions
Save
Nearby
Send to your phone
Share
COVID-19 vaccine location
NH No.6, Bhusawal Rd, Jalgaon, Maharashtra 425309
Dr.Ulhas Patil Homoeopathic Medical...
Dr Ulhas Patil College Of Physiotherapy
Dr. Ulhas Patil Medical College & Hospital
Dupmc Jalgaon
Devdas point Dupmc
Hotel Rasoi Garden
Takeout · Delivery
AH46
53
Layers
Google

ELECTRICITY BILL SUMMARY

Dr Ulhas Patil Medical College and Hospital, Jalgaon has one MSEDCL three phase HT electricity connections for college building and hospital building.
The major electricity consumption in college building is lighting, fan, air coolers etc. In hospital lighting, fans, HVAC or VRV system for various laboratories are major energy consumptions.
Water pumping system is also have large energy consuming utility in the premises.
Hostels and staff quarters and other small buildings also lighting and fans are the major energy consumptions.

OBSERVATION

1. Total monthly average energy consumption of the college and hospital is more than 21,000 units.
2. Total average monthly billing is INR 27,29,000 /-
3. Average unit rate of electricity for the college is 13.10 INR/kWh
4. In summer season actual demand is more than contract demand due to which college has paid excess contract demand penalty.
5. No Solar Photovoltaic system is installed in the college for energy generation.
6. In summer season energy consumption of AC and air coolers is increased due to hot temperature in the region.

ELECTRICITY BILL SUMMARY

Month	Bill Demand	Actual Demand	Units	Units	Diff.	Demand Charges	Energy Charges	TOD Charges	Electricity duty	P.F	Excess demand charges	Total Bill	Average Unit Rate
	KVA	KVA	kWh	kVAh		INR	INR	INR	INR		INR	INR	INR/kWh
Sep-20	418	418	213438	214330	892	171798	2031848.40	-27893.20	482563.47	0.995	0	2794604.96	13.04
Oct-20	415	415	212743	213520	777	170565	2024169.60	-25425.20	481113.32	0.996	0	2786691.00	13.05
Nov-20	328	328	147208	150438	3230	134808	1426152.24	-13254.20	343025.70	0.978	0	2002964.44	13.31
Dec-20	326	317	154243	155593	1350	133986	1475021.64	-7189.20	355006.35	0.991	0	2087109.24	13.41
Jan-21	348	348	165253	166028	775	143028	1573945.44	-6826.50	379004.41	0.995	0	2215077.90	13.34
Feb-21	364	364	153643	155270	1627	149604	1471959.60	-6107.00	357831.68	0.989	0	2091093.38	13.47
Mar-21	436	436	226723	227815	1092	179196	2159686.20	-23255.60	513551.04	0.995	0	2967120.69	13.02
Apr-21	493	493	256705	257405	700	212976	2370700.05	-36380.60	565202.87	0.997	0	3246073.81	12.61
May-21	554	554	280078	281135	1057	239328	2589253.35	-45797.80	622344.90	0.996	23328	3563082.98	12.67
Jun-21	532	532	257800	259105	1305	229824	2386357.05	-35106.30	574401.57	0.994	9072	3301805.24	12.74
Jul-21	514	514	257380	258825	1445	222048	2383778.25	-30352.70	0.00	0.994	0	2709278.26	10.47
Aug-21	451	451	233620	235320	1700	194832	2167297.20	-25859.20	518290.33	0.992	0	2988760.44	12.70

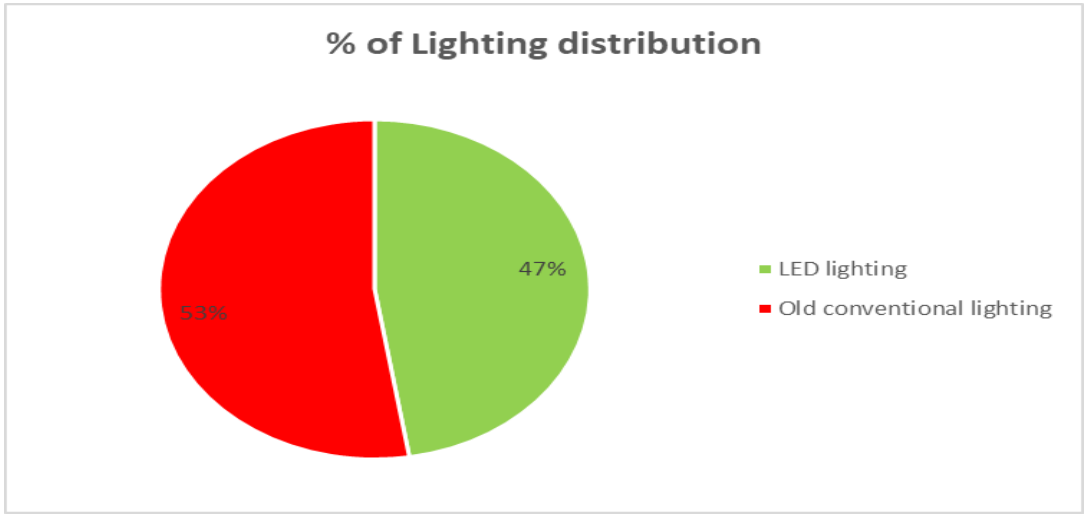
NERGY PERFORMANCE ASSESSMENT OF LIGHTING

1. COLLEGE BUILDING AND OTHERS

OBSERVATION

College has installed new energy efficient LED lighting in the college building. There are old conventional lightings are also in the college in use.

Type	Quantity	kW load	% of load
LED lighting	1372	24.70	47.42
Old conventional lighting	1521	54.76	52.58
Total	2893	79.45	100



PERFORMANCE ASSESSMENT OF LIGHTING SYSTEM

Building	Floor	Name	Light Type	Type	Qty	Wattage	Hours of usage	No of Days in a month	Monthly consumption
					Nos	watt	hrs	days	kWh/day
Main building	Ground floor	Passage	LED	1x18W	12	18	5	25	27.00
			FTL	1x36W	40	36	5	25	180.00
		All offices	LED	1x18W	28	18	5	25	63.00
			FTL	1x36W	3	36	5	25	13.50
		Reading hall	LED	1x18W	15	18	5	25	33.75
		Function hall	LED	1x18W	1	18	5	25	2.25
		Ketki hall	LED	1x18W	8	18	5	25	18.00
		Lecture theatre new	LED	1x18W	38	18	5	25	85.50
		Lecture theatre 1	LED	1x18W	3	18	5	25	6.75
		Lecture theatre 2	FTL	1x36W	61	36	5	25	274.50
		Bio-chemistry dept	LED	1x18W	22	18	5	25	49.50
			FTL	1x36W	16	36	5	25	72.00
		Pathology dept	LED	1x18W	38	18	5	25	85.50
			FTL	1x36W	4	36	5	25	18.00
			LED	1x9W	25	9	5	25	28.13
		Physiology dept	LED	1x18W	13	18	5	25	29.25
			FTL	1x36W	20	36	5	25	90.00
		Anatomy dept	FTL	1x18W	44	18	5	25	99.00
			FTL	1x36W	36	36	5	25	162.00
		Dissection hall	LED	1x50W	24	18	5	25	54.00

			FTL	1x36W	50	36	5	25	225.00
	First floor	Passage	FTL	1x36W	40	36	5	25	180.00
		Anatomy museum	FTL	1x36W	34	36	5	25	153.00
		Forensic medicine and Toxicology	FTL	1x36W	7	36	5	25	31.50
		Forensic medicine and Toxicology museum	FTL	1x36W	31	36	5	25	139.50
		Reading hall and library	FTL	1x36W	84	36	5	25	378.00
		Clinical and pharm clinical lab	FTL	1x36W	51	36	5	25	229.50
		Medical edu. Tech, dept	LED	1x18W	2	18	5	25	4.50
		Pharmacology dept	FTL	1x36W	32	36	5	25	144.00
		Microbiology dept	LED	1x18W	50	18	5	25	112.50
			FTL	1x36W	99	36	5	25	445.50
		Aniket hall	LED	1x18W	32	18	5	25	72.00
		Princess keiva hall	LED	1x18W	48	18	5	25	108.00
	Second floor	Passage	LED	1x18W	5	18	5	5	2.25
			FTL	1x36W	18	36	5	25	81.00
		Reading hall	FTL	1x36W	43	36	5	25	193.50
		E-library	FTL	1x36W	19	36	5	25	85.50
		Other offices and rooms	FTL	1x36W	25	36	5	25	112.50
		PSM community medicine dept	LED	1x18W	45	18	5	25	101.25
		Physiotherapy dept	LED	1x18W	86	18	5	25	193.50
			FTL	1x36W	9	36	5	25	40.50
		Auditorium hall	FTL	1x36W	20	36	5	25	90.00
	Third floor	Nursing	LED	1x18W	9	18	5	25	20.25
			FTL	1x36W	82	36	5	25	369.00
		Nursing hostel	LED	1x18W	88	18	5	25	198.00
Premises		Construction/workshop dept	LED	1x18W	15	18	5	25	33.75

			FTL	1x36W	7	36	5	25	31.50
		Main canteen	LED	1x18W	47	18	5	25	105.75
Hostels		Boy's hostel	LED	1x18W	150	18	5	25	337.50
			FTL	1x36W	72	36	5	25	324.00
		Girl's hostel-3 storey	LED	1x18W	114	18	5	25	256.50
			FTL	1x36W	114	36	5	25	513.00
		Girl's hostel-5 storey	LED	1x18W	95	18	5	25	213.75
			FTL	1x36W	95	36	5	25	427.50
		Printing press	LED	1x18W	11	18	5	25	24.75
			FTL	1x36W	4	36	5	25	18.00
			FTL	1x36W	2	36	5	25	9.00
Hospital		Admin office	LED	1x18W	3	18	10	30.5	16.47
			FTL	1x36W	2	36	10	30.5	21.96
		OT	LED	1x18W	20	18	10	30.5	109.80
			FTL	1x36W	20	36	10	30.5	219.60
		M/P	LED	1x18W	4	18	10	30.5	21.96
			FTL	1x36W	3	36	10	30.5	32.94
		Medicine OPD	LED	1x18W	15	18	10	30.5	82.35
			FTL	1x36W	18	36	10	30.5	197.64
		Orthopaedic	LED	1x18W	6	18	10	30.5	32.94
			FTL	1x36W	6	36	10	30.5	65.88
		Psychiatry	LED	1x18W	2	18	10	30.5	10.98
			FTL	1x36W	2	36	10	30.5	21.96
		Opthal	LED	1x18W	8	18	10	30.5	43.92
			FTL	1x36W	9	36	10	30.5	98.82
		Retina	LED	1x18W	2	18	10	30.5	10.98
			FTL	1x36W	2	36	10	30.5	21.96

		CT scan	LED	1x18W	1	18	10	30.5	5.49
		Male and female ortho	LED	1x18W	22	18	10	30.5	120.78
			FTL	1x36W	22	36	10	30.5	241.56
		Physiotherapy OPD	LED	1x18W	6	18	10	30.5	32.94
			FTL	1x36W	7	36	10	30.5	76.86
		Vaccination centre	FTL	1x36W	2	36	10	30.5	21.96
		Paediatrics OPD	LED	1x18W	3	18	10	30.5	16.47
			FTL	1x36W	3	36	10	30.5	32.94
		ENT OPD	LED	1x18W	5	18	10	30.5	27.45
			FTL	1x36W	4	36	10	30.5	43.92
		Examination room	LED	1x18W	4	18	10	30.5	21.96
			FTL	1x36W	4	36	10	30.5	43.92
		Central clinical lab	LED	1x18W	19	18	10	30.5	104.31
			FTL	1x36W	20	36	10	30.5	219.60
		Micro lab	LED	1x18W	4	18	10	30.5	21.96
			FTL	1x36W	4	36	10	30.5	43.92
		Dental	LED	1x18W	8	18	10	30.5	43.92
			FTL	1x36W	9	36	10	30.5	98.82
		ENT	LED	1x18W	2	18	10	30.5	10.98
			FTL	1x36W	2	36	10	30.5	21.96
		Muwe mycusis	LED	1x18W	3	18	10	30.5	16.47
			FTL	1x36W	4	36	10	30.5	43.92
		Skin dept	LED	1x18W	3	18	10	30.5	16.47
			FTL	1x36W	3	36	10	30.5	32.94
		CICU	LED	1x18W	12	18	10	30.5	65.88
			FTL	1x36W	13	36	10	30.5	142.74
		Medicine	LED	1x18W	29	18	10	30.5	159.21

			FTL	1x36W	29	36	10	30.5	318.42
		ISW	LED	1x18W	23	18	10	30.5	126.27
			FTL	1x36W	24	36	10	30.5	263.52
		MRD, Store	LED	1x18W	4	18	10	30.5	21.96
			FTL	1x36W	5	36	10	30.5	54.90
		MSW	LED	1x18W	27	18	10	30.5	148.23
			FTL	1x36W	28	36	10	30.5	307.44
		Paediatrics	LED	1x18W	24	18	10	30.5	131.76
			FTL	1x36W	24	36	10	30.5	263.52
		OBGY dept	LED	1x18W	26	18	10	30.5	142.74
			FTL	1x36W	26	36	10	30.5	285.48
		OBGY lab	LED	1x18W	15	18	10	30.5	82.35
			FTL	1x36W	15	36	10	30.5	164.70
		Surgery OPD	LED	1x18W	6	18	10	30.5	32.94
			FTL	1x36W	6	36	10	30.5	65.88
		ESIC, Matron office	LED	1x18W	4	18	10	30.5	21.96
			FTL	1x36W	4	36	10	30.5	43.92
		Casualty	LED	1x18W	21	18	10	30.5	115.29
			FTL	1x36W	21	36	10	30.5	230.58
		Sonography	LED	1x18W	7	18	10	30.5	38.43
			FTL	1x36W	7	36	10	30.5	76.86
		X-ray room	LED	1x18W	2	18	10	30.5	10.98
			FTL	1x36W	3	36	10	30.5	32.94
		Account office	LED	1x18W	3	18	10	30.5	16.47
			FTL	1x36W	3	36	10	30.5	32.94
		Registration counter	LED	1x18W	5	18	10	30.5	27.45
			FTL	1x36W	5	36	10	30.5	54.90

ENERGY SAVING MEASURES

Building	Floor	Name	Change	New wattage	New used Qty	New monthly consumption	Monthly saving	Total investment	Payback period
				watt	nos	kWh/month	kWh/month	INR	months
Main building	Ground floor	Passage	No change	18	12	27.00	0.00	0	#DIV/0!
			LED-1x18W	18	40	90.00	90.00	6800	5.77
		All offices	No change	18	28	63.00	0.00	0	#DIV/0!
			LED-1x18W	18	3	6.75	6.75	510	5.77
		Reading hall	No change	18	15	33.75	0.00	0	#DIV/0!
		Function hall	No change	18	1	2.25	0.00	0	#DIV/0!
		Ketki hall	No change	18	8	18.00	0.00	0	#DIV/0!
		Lecture teature new	No change	18	38	85.50	0.00	0	#DIV/0!
		Lecture theatre 1	No change	18	3	6.75	0.00	0	#DIV/0!
		Lecture theatre 2	LED-1x18W	18	61	137.25	137.25	10370	5.77
		Bio-chemistry dept	No change	18	22	49.50	0.00	0	#DIV/0!
			LED-1x18W	18	16	36.00	36.00	2720	5.77
		Pathology dept	No change	18	38	85.50	0.00	0	#DIV/0!
			LED-1x18W	18	4	9.00	9.00	680	5.77
			No change	9	25	28.13	0.00	0	#DIV/0!
		Physiology dept	No change	18	13	29.25	0.00	0	#DIV/0!
			LED-1x18W	18	20	45.00	45.00	3400	5.77
		Anatomy dept	LED-1x18W	9	44	49.50	49.50	6600	10.18
			LED-1x18W	18	36	81.00	81.00	6120	5.77
		Dissection hall	No change	50	24	150.00	-96.00	0	0.00

			LED-1x18W	18	50	112.50	112.50	8500	5.77
	First floor	Passage	LED-1x18W	18	40	90.00	90.00	6800	5.77
		Anatomy museum	LED-1x18W	18	34	76.50	76.50	5780	5.77
		Forensic medicine and Toxicology	LED-1x18W	18	7	15.75	15.75	1190	5.77
		Forensic medicine and Toxicology museum	LED-1x18W	18	31	69.75	69.75	5270	5.77
		Reading hall and library	LED-1x18W	18	84	189.00	189.00	14280	5.77
		Clinical and pharm clinical lab	LED-1x18W	18	51	114.75	114.75	8670	5.77
		Medical edu. Tech, dept	No change	18	2	4.50	0.00	0	#DIV/0!
		Pharmacology dept	LED-1x18W	18	32	72.00	72.00	5440	5.77
		Microbiology dept	No change	18	50	112.50	0.00	0	#DIV/0!
			LED-1x18W	18	99	222.75	222.75	16830	5.77
		Aniket hall	No change	18	32	72.00	0.00	0	#DIV/0!
		Princess keiva hall	No change	18	48	108.00	0.00	0	#DIV/0!
	Second floor	Passage	No change	18	5	2.25	0.00	0	#DIV/0!
			LED-1x18W	18	18	40.50	40.50	3060	5.77
		Reading hall	LED-1x18W	18	43	96.75	96.75	7310	5.77
		E-library	LED-1x18W	18	19	42.75	42.75	3230	5.77
		Other offices and rooms	LED-1x18W	18	25	56.25	56.25	4250	5.77
		PSM community medicine dept	No change	18	45	101.25	0.00	0	#DIV/0!
		Physiotherapy dept	No change	18	86	193.50	0.00	0	#DIV/0!
			LED-1x18W	18	9	20.25	20.25	1530	5.77
		Auditorium hall	LED-1x18W	18	20	45.00	45.00	3400	5.77
	Third floor	Nursing	No change	18	9	20.25	0.00	0	#DIV/0!
			LED-1x18W	18	82	184.50	184.50	13940	5.77
		Nursing hostel	No change	18	88	198.00	0.00	0	#DIV/0!
Premises		Construction/workshop dept	No change	18	15	33.75	0.00	0	#DIV/0!

			LED-1x18W	18	7	15.75	15.75	1190	5.77
		Main canteen	No change	18	47	105.75	0.00	0	#DIV/0!
Hostels		Boy's hostel	No change	18	150	337.50	0.00	0	#DIV/0!
			LED-1x18W	18	72	162.00	162.00	12240	5.77
		Girl's hostel-3 storey	No change	18	114	256.50	0.00	0	#DIV/0!
			LED-1x18W	18	114	256.50	256.50	19380	5.77
		Girl's hostel-5 storey	No change	18	95	213.75	0.00	0	#DIV/0!
			LED-1x18W	18	95	213.75	213.75	16150	5.77
		Printing press	No change	18	11	24.75	0.00	0	#DIV/0!
			LED-1x18W	18	4	9.00	9.00	680	5.77
			LED-1x18W	18	2	4.50	4.50	340	5.77
Hospital		Admin office	No change	18	3	16.47	0.00	0	#DIV/0!
			LED-1x18W	18	2	10.98	10.98	340	2.36
		OT	No change	18	20	109.80	0.00	0	#DIV/0!
			LED-1x18W	18	20	109.80	109.80	3400	2.36
		M/P	No change	18	4	21.96	0.00	0	#DIV/0!
			LED-1x18W	18	3	16.47	16.47	510	2.36
		Medicine OPD	No change	18	15	82.35	0.00	0	#DIV/0!
			LED-1x18W	18	18	98.82	98.82	3060	2.36
		Orthopaedic	No change	18	6	32.94	0.00	0	#DIV/0!
			LED-1x18W	18	6	32.94	32.94	1020	2.36
		Psychiatry	No change	18	2	10.98	0.00	0	#DIV/0!
			LED-1x18W	18	2	10.98	10.98	340	2.36
		Opthal	No change	18	8	43.92	0.00	0	#DIV/0!
			LED-1x18W	18	9	49.41	49.41	1530	2.36
		Retina	No change	18	2	10.98	0.00	0	#DIV/0!
			LED-1x18W	18	2	10.98	10.98	340	2.36

		CT scan	No change	18	1	5.49	0.00	0	#DIV/0!
		Male and female ortho	No change	18	22	120.78	0.00	0	#DIV/0!
			LED-1x18W	18	22	120.78	120.78	3740	2.36
		Physiotherapy OPD	No change	18	6	32.94	0.00	0	#DIV/0!
			LED-1x18W	18	7	38.43	38.43	1190	2.36
		Vaccination centre	LED-1x18W	18	2	10.98	10.98	340	2.36
		Paediatrics OPD	No change	18	3	16.47	0.00	0	#DIV/0!
			LED-1x18W	18	3	16.47	16.47	510	2.36
		ENT OPD	No change	18	5	27.45	0.00	0	#DIV/0!
			LED-1x18W	18	4	21.96	21.96	680	2.36
		Examination room	No change	18	4	21.96	0.00	0	#DIV/0!
			LED-1x18W	18	4	21.96	21.96	680	2.36
		Central clinical lab	No change	18	19	104.31	0.00	0	#DIV/0!
			LED-1x18W	18	20	109.80	109.80	3400	2.36
		Micro lab	No change	18	4	21.96	0.00	0	#DIV/0!
			LED-1x18W	18	4	21.96	21.96	680	2.36
		Dental	No change	18	8	43.92	0.00	0	#DIV/0!
			LED-1x18W	18	9	49.41	49.41	1530	2.36
		ENT	No change	18	2	10.98	0.00	0	#DIV/0!
			LED-1x18W	18	2	10.98	10.98	340	2.36
		Muwe mycusis	No change	18	3	16.47	0.00	0	#DIV/0!
			LED-1x18W	18	4	21.96	21.96	680	2.36
		Skin dept	No change	18	3	16.47	0.00	0	#DIV/0!
			LED-1x18W	18	3	16.47	16.47	510	2.36
		CICU	No change	18	12	65.88	0.00	0	#DIV/0!
			LED-1x18W	18	13	71.37	71.37	2210	2.36
		Medicine	No change	18	29	159.21	0.00	0	#DIV/0!

			LED-1x18W	18	29	159.21	159.21	4930	2.36
		ISW	No change	18	23	126.27	0.00	0	#DIV/0!
			LED-1x18W	18	24	131.76	131.76	4080	2.36
		MRD, Store	No change	18	4	21.96	0.00	0	#DIV/0!
			LED-1x18W	18	5	27.45	27.45	850	2.36
		MSW	No change	18	27	148.23	0.00	0	#DIV/0!
			LED-1x18W	18	28	153.72	153.72	4760	2.36
		Paediatrics	No change	18	24	131.76	0.00	0	#DIV/0!
			LED-1x18W	18	24	131.76	131.76	4080	2.36
		OBGY dept	No change	18	26	142.74	0.00	0	#DIV/0!
			LED-1x18W	18	26	142.74	142.74	4420	2.36
		OBGY lab	No change	18	15	82.35	0.00	0	#DIV/0!
			LED-1x18W	18	15	82.35	82.35	2550	2.36
		Surgery OPD	No change	18	6	32.94	0.00	0	#DIV/0!
			LED-1x18W	18	6	32.94	32.94	1020	2.36
		ESIC, Matron office	No change	18	4	21.96	0.00	0	#DIV/0!
			LED-1x18W	18	4	21.96	21.96	680	2.36
		Casualty	No change	18	21	115.29	0.00	0	#DIV/0!
			LED-1x18W	18	21	115.29	115.29	3570	2.36
		Sonography	No change	18	7	38.43	0.00	0	#DIV/0!
			LED-1x18W	18	7	38.43	38.43	1190	2.36
		X-ray room	No change	18	2	10.98	0.00	0	#DIV/0!
			LED-1x18W	18	3	16.47	16.47	510	2.36
		Account office	No change	18	3	16.47	0.00	0	#DIV/0!
			LED-1x18W	18	3	16.47	16.47	510	2.36
		Registration counter	No change	18	5	27.45	0.00	0	#DIV/0!
			LED-1x18W	18	5	27.45	27.45	850	2.36

Total lighting savings- College building and Other		
Monthly consumption	13249.22	kWh/month
New monthly consumption	8809.31	kWh/month
New monthly saving	4439.91	kWh/month
New monthly saving	**58162.82**	**INR/month**
Total Investment	257690	INR
Payback period	**4.43**	**months**

ENERGY SAVING MEASURES- OTHER RECOMMENDATIONS

College can installed motions sensor LED tube lights or bulbs where lighting is on for maximum period and occupancy or motion is less. This save additional energy by automatic switching of lighting.

ENERGY PERFORMANCE ASSESSMENT OF FAN

1. MAIN COLLEGE BUILDING, CIRCULAR BUILDING AND OTHERS

OBSERVATION

College has installed old conventional induction motor fan which consumes 70W at full speed. It is recommended that replace old fan which are operated maximum usage per day with new energy efficient fan which consumes 28W at full speed.

ENERGY SAVING MEASURES

Building	Floor	Name	Qty	Wattage	Hours of usage	No of Days in a month	Monthly consumption	New wattage	New monthly consumption	Monthly saving	Total investment	Payback period
			Nos	watt	hrs	days	kWh/day	watt	kWh/month	kWh/month	INR	months
Main building	Ground floor	Passage	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		All offices	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Reading hall	4	70	5	25	35.00	28	14.00	21.00	7200	26.17
		Function hall	4	70	5	25	35.00	28	14.00	21.00	7200	26.17
		Ketki hall	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Lecture theatre new	12	70	5	25	105.00	28	42.00	63.00	21600	26.17
		Lecture theatre 1	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
		Lecture theatre 2	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
		Bio-chemistry dept	6	70	5	25	52.50	28	21.00	31.50	10800	26.17
		Pathology dept	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		Physiology dept	10	70	5	25	87.50	28	35.00	52.50	18000	26.17
		Anatomy dept	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
		Dissection hall	4	70	5	25	35.00	28	14.00	21.00	7200	26.17
	First	Passage	1	70	5	25	8.75	28	3.50	5.25	1800	26.17

	floor											
		Anatomy museum	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		Forensic medicine and Toxicology	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Forensic medicine and Toxicology museum	7	70	5	25	61.25	28	24.50	36.75	12600	26.17
		Reading hall and library	14	70	5	25	122.50	28	49.00	73.50	25200	26.17
		Clinical and pharm clinical lab	5	70	5	25	43.75	28	17.50	26.25	9000	26.17
		Medical edu. Tech, dept	5	70	5	25	43.75	28	17.50	26.25	9000	26.17
		Pharmacology dept	9	70	5	25	78.75	28	31.50	47.25	16200	26.17
		Microbiology dept	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Aniket hall	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		Princess keiva hall	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
	Second floor	Passage	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
		Reading hall	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
		E-library	4	70	5	25	35.00	28	14.00	21.00	7200	26.17
		Other offices and rooms	4	70	5	25	35.00	28	14.00	21.00	7200	26.17
		PSM community medicine dept	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		Physiotherapy dept	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
		Auditorium hall	3	70	5	25	26.25	28	10.50	15.75	5400	26.17
	Third floor	Nursing	20	70	5	25	175.00	28	70.00	105.00	36000	26.17
		Nursing hostel	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
Premises		Construction/workshop dept	5	70	5	25	43.75	28	17.50	26.25	9000	26.17
		Main canteen	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
Hostels		Boy's hostel	10	70	5	25	87.50	28	35.00	52.50	18000	26.17

		Girl's hostel-3 storey	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Girl's hostel-5 storey	1	70	5	25	8.75	28	3.50	5.25	1800	26.17
		Printing press	2	70	5	25	17.50	28	7.00	10.50	3600	26.17
Hospital		Admin office	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		OT	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		M/P	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		Medicine OPD	4	70	8	30.5	68.32	28	27.33	40.99	7200	13.41
		Orthopaedic	5	70	8	30.5	85.40	28	34.16	51.24	9000	13.41
		Psychiatry	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Opthal	9	70	8	30.5	153.72	28	61.49	92.23	16200	13.41
		Retina	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		CT scan	6	70	8	30.5	102.48	28	40.99	61.49	10800	13.41
		Male and female ortho	13	70	8	30.5	222.04	28	88.82	133.22	23400	13.41
		Physiotherapy OPD	10	70	8	30.5	170.80	28	68.32	102.48	18000	13.41
		Vaccination centre	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Paediatrics OPD	4	70	8	30.5	68.32	28	27.33	40.99	7200	13.41
		ENT OPD	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		Examination room	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		Central clinical lab	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Micro lab	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Dental	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		ENT	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		Muwe mycusis	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		Skin dept	5	70	8	30.5	85.40	28	34.16	51.24	9000	13.41
		CICU	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		Medicine	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		ISW	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		MRD, Store	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		MSW	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		Paediatrics	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41

		OBGY dept	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		OBGY lab	2	70	8	30.5	34.16	28	13.66	20.50	3600	13.41
		Surgery OPD	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		ESIC, Matron office	1	70	8	30.5	17.08	28	6.83	10.25	1800	13.41
		Casualty	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Sonography	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		X-ray room	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Account office	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41
		Registration counter	3	70	8	30.5	51.24	28	20.50	30.74	5400	13.41

Total fan savings- College building and other		
Monthly consumption	3434.2	kWh/month
New monthly consumption	1373.68	kWh/month
New monthly saving	2060.52	kWh/month
New monthly saving	**26992.81**	**INR/month**
Total Investment	509400	INR
Payback period	**18.87**	**months**

ENERGY PERFORMANCE ASSESSMENT OF WATER PUMPING

OBSERVATION

1. There are more than eight pumps operated in the premises for gardening, drinking water and domestic purposes at college, hospital, staff quarter, girl's and boy's hostel etc
2. One centralized water sump tank is in the premises where water comes from bore well in the college and one pump outside the premises at water body.
3. There are two main water lines goes from water sump to college and hospital. After that again water distributed to various buildings like hostels, college building, staff quarter, hospital and its various buildings etc.
4. Main two water line is always pressurized at 4 kg.
5. Various pumps at different buildings are operated automatically with sensors.

Particulars	Rated			Actual			
	Power	Flow	Head	Voltage	Current	Power	PF
	kW	lps	m	V	A	kW	
Account pump	2.238	7	18	410	3.6	2.04	0.85
Anatomy pump	2.238	7	18	413	3.9	2.04	0.85
C-type pump	2.238	7	18	409	3.7	2.04	0.85
Boy's hostel	2.238	7	18	405	3.8	2.04	0.85
	2.238	7	18	413	3.6	2.04	0.85
New girl's hostel	2.238	7	18	410	3.9	2.04	0.85
Account bore well	NA	NA	NA	414	17.95	8.8655	0.788
Old bore well	NA	NA	NA	400	9.8	6.32	0.995
Sump pump no-2	NA	NA	NA	393	24	14.88	0.88
Total Power						**42.31**	

RECOMMENDATION

1. It is recommended that to replace the old less energy efficient (46.5%) with new energy efficient water pumps.
2. Optimises the existing water pumping system with new water pump system in which discard the various pumps at building locations. Fitted the ball valve at overhead tank inlets. Install only two pumps at centralised water sump in which one is stand by pump. Installed the pressurized water tank system to the new pump to regulate the water line pressure.
3. It is recommended that bore well pump should be run by automatic control panel with cyclic timer based to optimise the pump efficiency and to help the ground water recharge.
4. Also sensors or automatic pressure tank can be used for water pumping with precaution of there is no leakage in water line to avoid water as well as energy loss.
5. This will save 20 to 30 % of energy in water pumping.

SAVINGS MEASURES

SAVINGS DUE TO WATER PUMPING SYSTEM OPTIMISATION

Total water pump savings		
Total monthly consumption	300.2	kWh/day
Total monthly consumption	7505	kWh/month
New monthly consumption	5253.50	kWh/month
Total saving kWh	2251.50	kWh/month
Total saving INR	**29494.65**	**INR/month**
Total Investment	1000000	INR/month
Payback period	34	months
Payback period	**2.83**	**year**

SAVING IN VRV SYSTEM (SOALR THERMAL COOLING SYSTEM)

OBSERVATION

1. In hospital building, for laboratories cooling new energy efficient VRV systems of Diakin Company are installed.
2. Total 3 number of VRV system of total 42.38kW operating for 24 hrs/day.

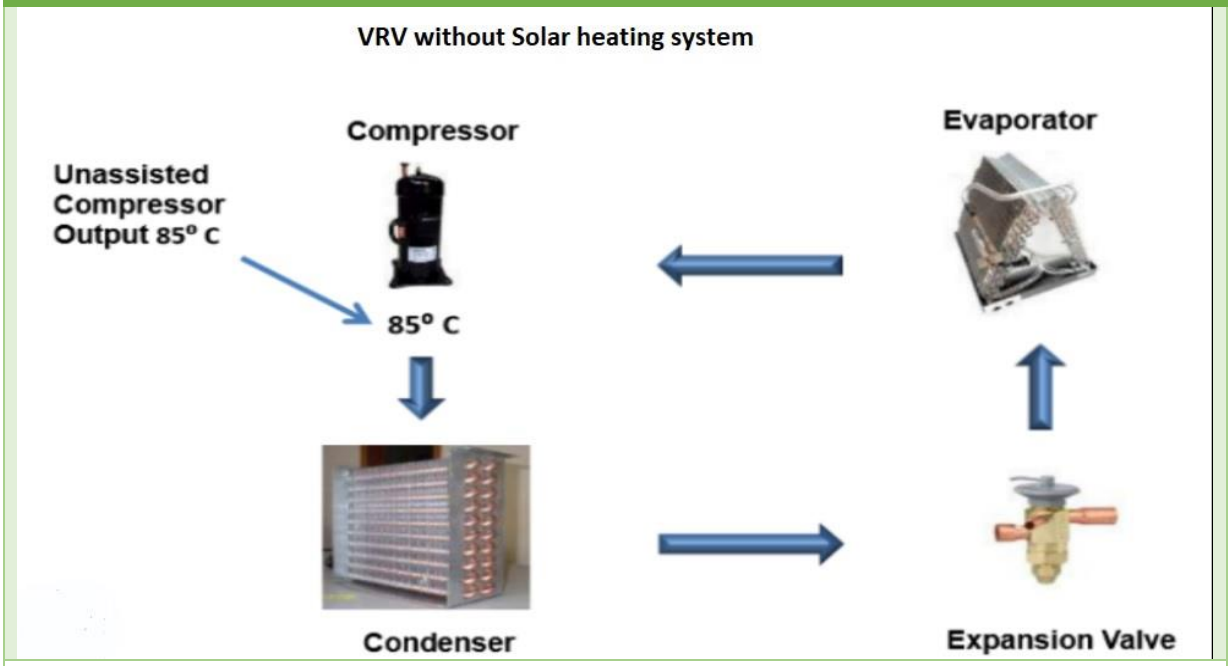
VRV system

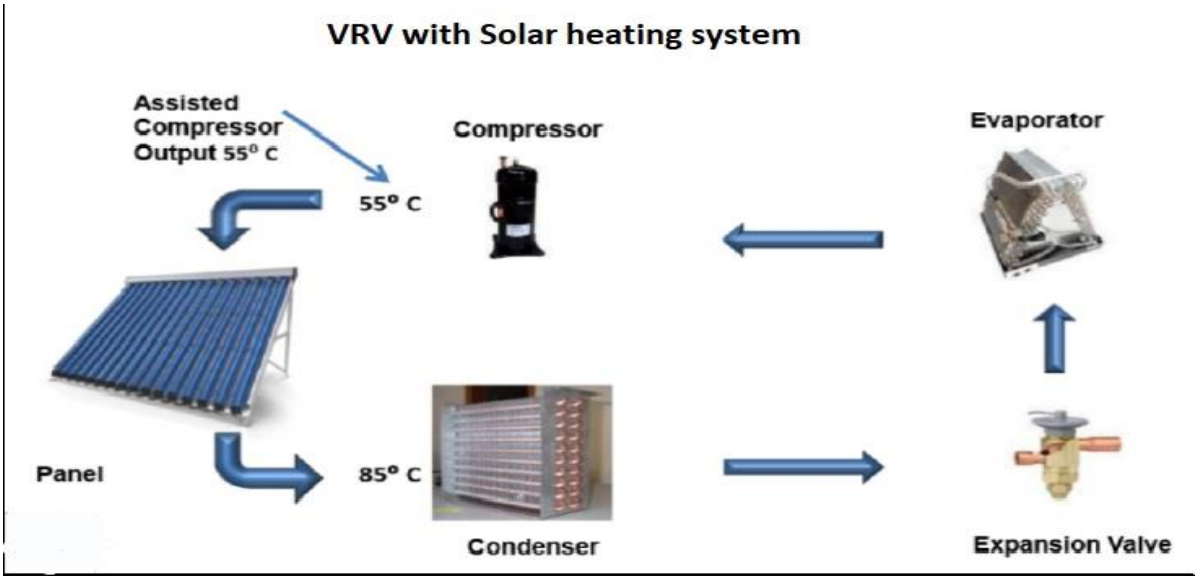
RECOMMENDATION

1. It is recommended that college/hospital can installed “Solar heating system” or “Solar thermal cooling system” for VRV to reduce the energy consumption by 30%.

VRV system with Solar heating or Solar thermal cooling system

VRV system with Solar heating or Solar thermal cooling system





SAVINGS MEASURES

SAVINGS DUE TO SOLAR HEATING SYSTEM FOR VRV

Particulars-Total savings in VRV		
Number of VRV system	3	nos
Total rated power	42.38	kWh/month
Operating hours	24	hrs/day
Total daily consumption	762.84	kWh/month
Total monthly consumption	23266.62	kWh/month
Saving potential	30	%
New monthly consumption	16286.63	kWh/month
Total saving kWh	6979.99	kWh/month
Total saving INR	**91437.82**	**INR/month**
Total Investment	2000000	INR/month
Payback period	21.87	months
Payback period	**1.82**	**year**

SAVING BY ELECTRICITY DUTY EXEMPTION

OBSERVATION

3. In electricity bill of hostel, college pays electricity duty of INR 4, 70,000/- average per month.
4. As per Maharashtra electricity duty act-1948 and revised in Maharashtra electricity duty act-2016, electricity duty it is exempted for colleges, hospital etc.

SAVINGS MEASURES

1. College can get exemption of electricity duty in the electricity bill as per act.
2. Also electricity duty paid from the date of connection can be recovered from MSEDCL.

SAVINGS DUE TO ELECTRICITY DUTY

Saving by electricity duty exemption		
Average monthly electricity duty of the college	4,70,000	INR/month

SAVING IN CONTRACT DEMAND

OBSERVATION

1. It is observed that contract demand of college electricity bill is 518KVA.
2. But in two months actual demand exceeds the contract demand up to 532 and 554 KVA.
3. Due to actual demand more than contract demand, college pays the excess demand charges of INR 23,000/- maximum.

RECOMMENDATION

1. It is recommended that to increase the contract demand from 518 KVA to 600 KVA to save additional demand charges paid in electricity bill.
2. Or install the Maximum Demand Controller (MD controller) to avoid excess demand in the electricity bill.

SAVINGS MEASURES

SAVINGS DUE TO CONTROLLING MAXIMUM DEMAND

Saving due to reducing contract demand		
Contract demand of the college electricity bill	518	KVA
New contract demand	600	KVA
Saving in excess demand charges	23,000	INR/month
Investment	10000	INR
Payback period	**2.3**	**months**

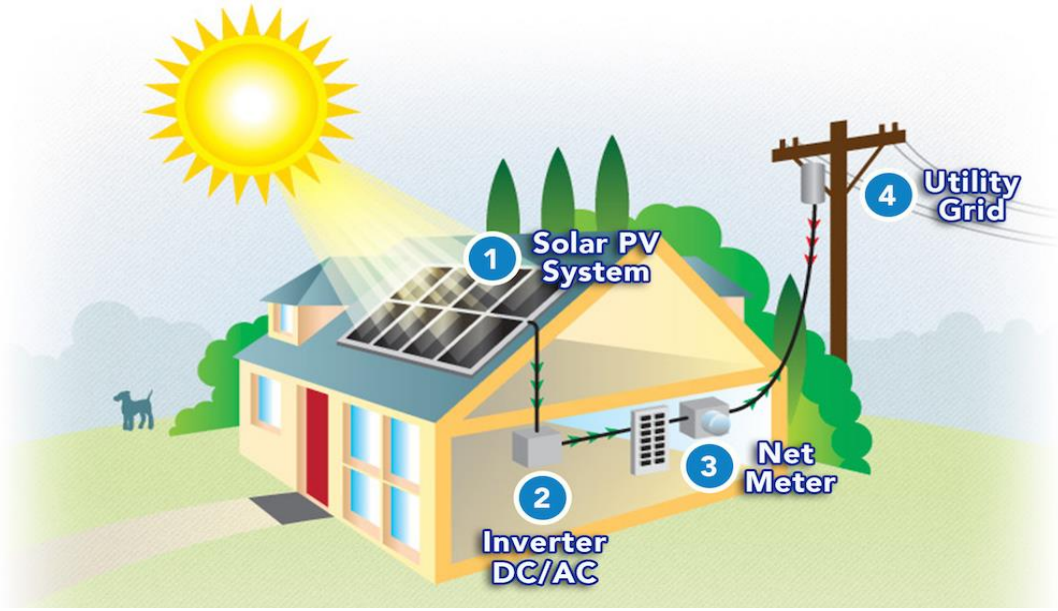
SOLAR PV SYSTEM WITH NET METER

INTRODUCATION

Solar photovoltaic system- with Net meter

Maharashtra Government has new solar energy policy name as “Rooftop Solar with Net Meter system”. Maharashtra government encourages to install rooftop solar PV system with net meters at available roof top of consumers. This helps to reduce the burden on existing conventional fuel fired power plants in the country.

Solar Rooftop Net meter system helps consumers to reduce the electricity consumption in the electricity bill due to net meter.



OBSERVATION

1. It is observed that in the college has not installed Solar PV system for solar energy generation.
2. In the college premises there are number of buildings.
3. Main college building, hospital, sports complex buildings have large amount of rooftop space available for Solar PV system installation.

RECOMMENDATION

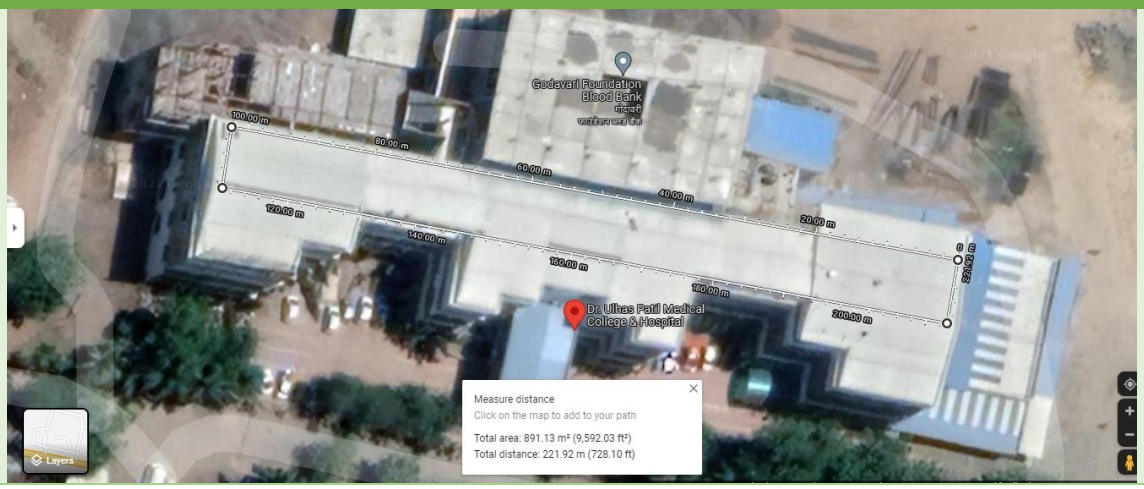
1. College can installed Solar PV system on rooftops as per energy consumption and rooftop space available on various available rooftop space of the buildings on CAPEX model.
2. Or College can installed Solar PV system on OPEX model i.e Built Operate Transfer (BoT) model where no need of investment by college.

SAVINGS MEASURES

SAVINGS DUE TO SOLAR PV SYSTEM INSTALLATION AND AVAILABLE ROOFTOP SPACE

College building

Hospital



Sports complex


Savings due to Solar PV system installation		
Total Rooftop space available- approximate	35000	sqfoot
Average energy consumption of main college building	210000	kWh/month
Total capacity of Solar PV system can be installed	318	kWp
Total solar unit generation	35795	kWh/month
Average electricity unit rate	13.1	INR/kWh
Total cost of Solar PV system	14318182	INR
Total saving	468920.5	INR/month
Payback period	30.53	months
Payback period	**2.54**	**year**

SAVING BY BO GAS PLANT

OBSERVATION

1. In the college canteen mainly bio gas is used which is produced at central Bio gas plant situated outside the college campus.
2. Separate bio gas line is connected to the college canteen.
3. During shortage of bio gas, then only LPG cylinders are used.

Bio gas plant

SAVINGS MEASURES

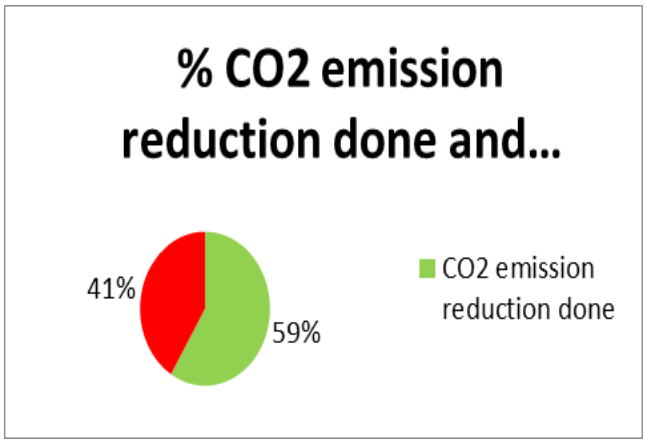
SAVINGS DUE TO BIO GAS PLANT

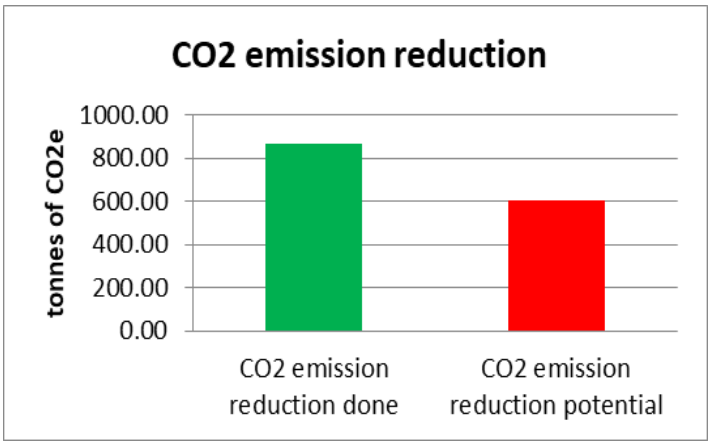
Saving due to Bio gas plant		
Capacity of bio gas plant	100000	kg/day
Approximate bio gas generation	100000	kg/day
Approximate bio gas generation	100	m3/day
Equivalent LPG gas saved	3050	m3/month
Approximate LPG saved	4575	kg/month
Approximate LPG cylinder saved	241	nos
Cost saved	**240789.47**	**INR/month**

CO_2 EMISSION REDUCTION

CO2 emission reduction done due to new energy efficient and renewable energy		
Energy saved by new energy efficient technology	6174	kWh/month
Energy saved by energy efficient technology	74088	kWh/year
Energy saved by renewable energy	55830	kWh/month
Energy saved by renewable energy	669960	kWh/year
CO2 emission reduction done	632.44	tonnes of CO2e

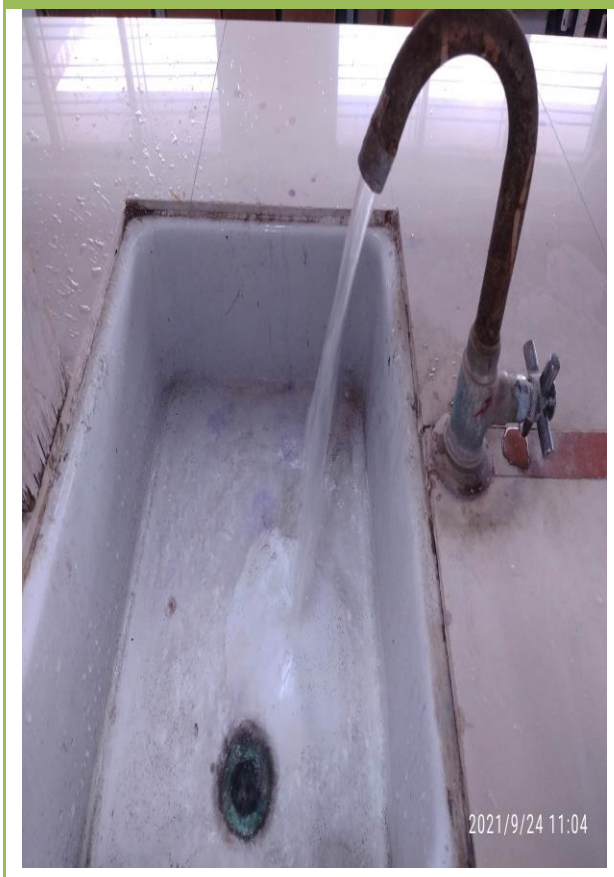
CO2 emission reduction potential		
CO2 emission reduction done	864.91	tonnes of CO2e
CO2 emission reduction potential	605.97	tonnes of CO2e
Total units saving potential-all		





ENERGY CONSERVATION BY SAVING OF WATER

1. TAP WATER REDUCER

Conventional Tap water system	Tap water system with Reducer
	
College have currently conventional tap water system at laboratories, bathrooms, kitchen, hostel etc Existing tap water system uses more water while during purpose of washing of utensils, hands etc in college.	**Used reducer to tap water for purpose of washing of utensils, hands etc which reduces flow of water and ultimately saves the water.**
⊘	√

RECOMMENDATION

It is recommended that increased the number of water reducers for water taping for save the water in other places like bathrooms, kitchen etc.

ANNEXTURE

ENERGY EFFICIENT FANS

ATOMBERG TECHNOLOGIES	
	**28 watts**
	**18watts or 8 watts as per size and load**

ENERGY EFFICIENT LIGHTING

LED Lightings	
	**18 watts, 9 watts, 5 watts** **Companies:**
	**1. Wipro** **2. Osram** **3. Syska** **4. Philips** **etc**
	**Motion sensor bulbs**