ENERGY AUDIT REPORT

ANJUMAN KAIRUL ISLAM'S

1970-2020

POONA COLLEGE OF ARTS, SCIENCE AND COMMERCE, PUNE

HIDAYATULLA RD, KATAD KHANA,

PUNE, MAHARASHTRA 411002

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Conducted and Submitted by

ENERFUTURE

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CERTIFICATE

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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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ACKNOWLEDGEMENT

Enerfuture thanks the management of Poona college of arts, science and commerce, Pune for assigning this important work of Energy Audit of Poona college of arts, science and commerce, Pune

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 Poona college of arts, science and commerce, Pune for their kind cooperation, furnishing required data, analysis report and support offered during our visit.

Name	Designation
Prof. (Dr.) Aftab Anwar Shaikh	Principal
Prof. Mr. Iqbal N. Shaikh	Vice-Principal (Science) & Head Department of Chemistry
Prof Dr. Mohammed Banekhan Pathan	Head Department of Statistics
Prof Dr. Jahir Abbas Ahmed	Assistant Professor
Prof Mr. Mohammed Umer	Assistant Professor

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

STUDY TEAM

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4	Mr Prasad Kalal	B.E Electrical, BE (Electrical), Electrical Supervisor(51242), Electrical Contractor(37364)
5	Mr Prashant Shinde	B.E Mechanical, IGBC Accredited Professional, Certified Energy Auditor

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

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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 other	Lightning recommendations	Replace existing old conventional 1x36W with new energy efficient 1x18W LED tube light battens	Existing lighting consumption= 1755.00kWh Expected energy consumption= 877.5kWh Total energy saved per month=877.5kWh	877.5	13162.5	81,250	6.27
2	College building and other	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= 1779.38kWh Expected energy consumption= 766.50kWh Total energy saved per month=1012.88kWh	1012.88	15193.2	6,13,200	40.36
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 =INR10000	-	10000	50,000	5

		Contract demand-Computer science building	Reduced the contract demand from 35KVA to 22KVA	Average demand charges saved =INR2387.2	-	2387.2	10,000	4.19
4	Main college building	Solar PV system	Can be installed 35 kWp system	Average monthly saving=3375kWh	3375	50625	19,50,000	38.5
5	Computer science building	Solar PV system	Can be installed 12 kWp system	Average monthly saving=1350kWh	1350	20250	7,80,000	38.5
		Total			**6615.38**	**111617.9**	**3484450**	**31**

COLLEGE INTRODUCTION

INTRODUCTION

The Poona College of Arts, Science & Commerce was established in the year 1970 by 'Anjuman Khairul Islam', Mumbai, a Philanthropic Charitable Trust dedicated to the noble cause of the orphans and the deprived. Situated prominently in the heart of Pune Camp, it has brought about a revolutionary change in the region's educational scenario, diversified in leaps and bounds and has carved a niche for itself as a celebrated seat of learning. This was humbly acknowledged by the National Assessment and Accreditation Council (NAAC) Bangalore in the year 2004 which awarded it by the Prestigious 'A' grade. On the path of continued excellence, the college once again obtained endorsement by NAAC when it got reaccredited in September 2015. The College is also having ISO 9001:2015 Certification.
The College is a recognized Research Centre of the Savitribai Phule Pune University in Chemistry, Commerce, and Economics and with full-fledged degree courses and Postgraduate Centres in Computer Science, Electronics, Organic Chemistry, Zoology, Economics, English, Urdu and Commerce. Apart from this, it also offers professional courses of B.B.A, B.C.A, B.Sc.(Computer Science) and M.Sc. (Computer Science). Poona College is also having four Bachelor of Vocation (B.Voc.) courses recognized by University Grants Commission in Software Development, Medical Laboratory Technology, Banking Finance and Insurance, Travel, Tourism and Hospitality Management. Gradually it has expanded on a national as well as global scale with student enrolment exceeding 6000 every year, and has become a favoured destination for education seekers from all Indian States particularly the North-East and from over 15 countries abroad.

The College prides itself by possessing a rare distinction of having a highly qualified, dedicated and enthusiastic staff with doctorates constituting a half while a quarter as M.Phil. Qualified. In addition to conventional teaching, more stress is laid on imbibing moral and ethical characters, career planning and guidance, sports and co-curricular activities such as NCC, NSS and Sports

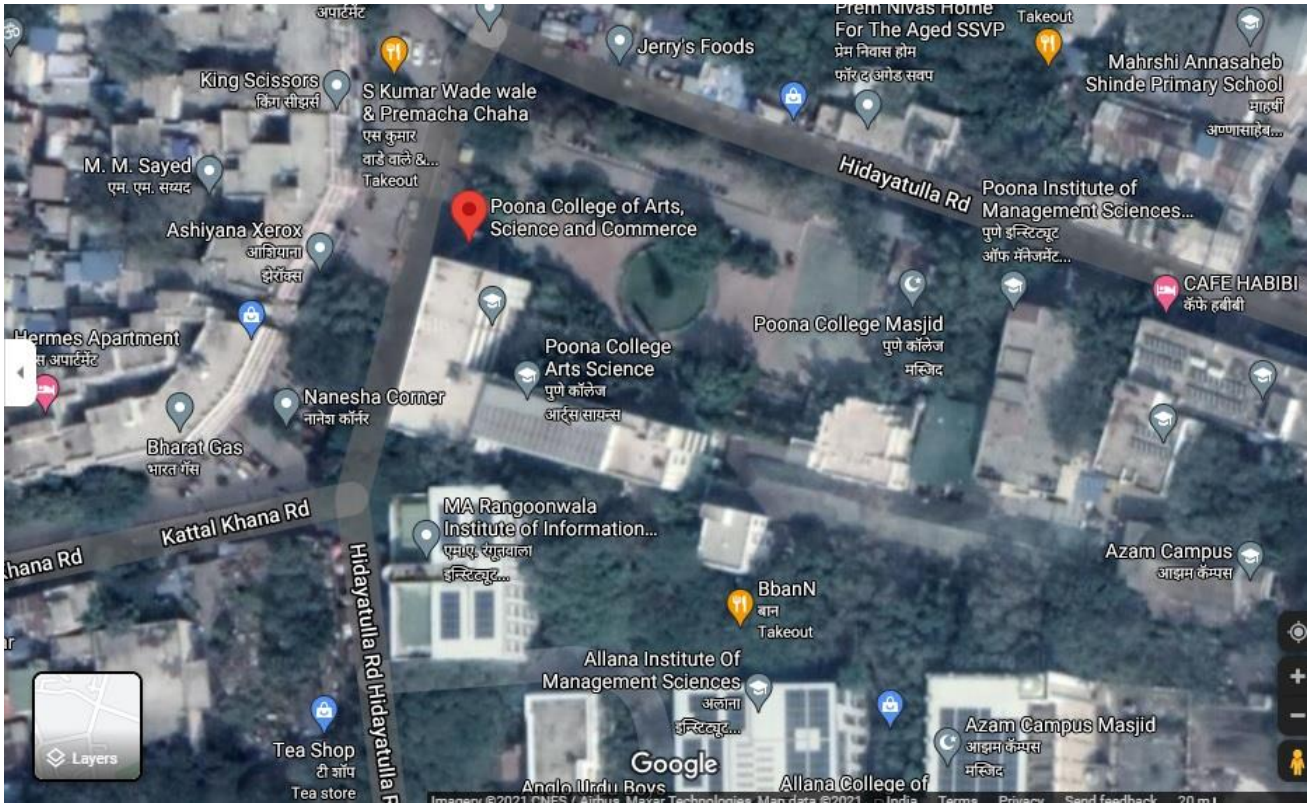
VISSION

Pursuit of Knowledge in the Service of Humanity.

MISSION

- To serve as a light house amidst all shortcomings and setbacks by defying complacency, we endeavour.
- To impart education to students belonging to all strata of society irrespective of caste, gender, colour, creed & religion.
- To uplift the deprived and academically weak students by empowering them with knowledge.
- To develop moral, ethical, social and aesthetic values amongst the students.
- To help equip and develop essential qualities to face the challenges posed by the turbulent currents of change.
- To inculcate respect for humanity and to fortify the ideals of perseverance, dedication, quality consciousness and excellence.
- To prepare citizens who could grow to be competent and significant contributors for the betterment of mankind through their profession

LOCATION



ELECTRICITY BILL SUMMARY

The Poona College of Arts, Science & Commerce, Pune have two number of MSEDCL three phase LT electricity connections in the Main college building and Computer Science building.

The major electricity consumption in college building is lighting, fans as well as water pumping to various buildings during college hours.

ELECTRICITY BILL SUMMARY

1. MAIN COLLEGE BUILDING

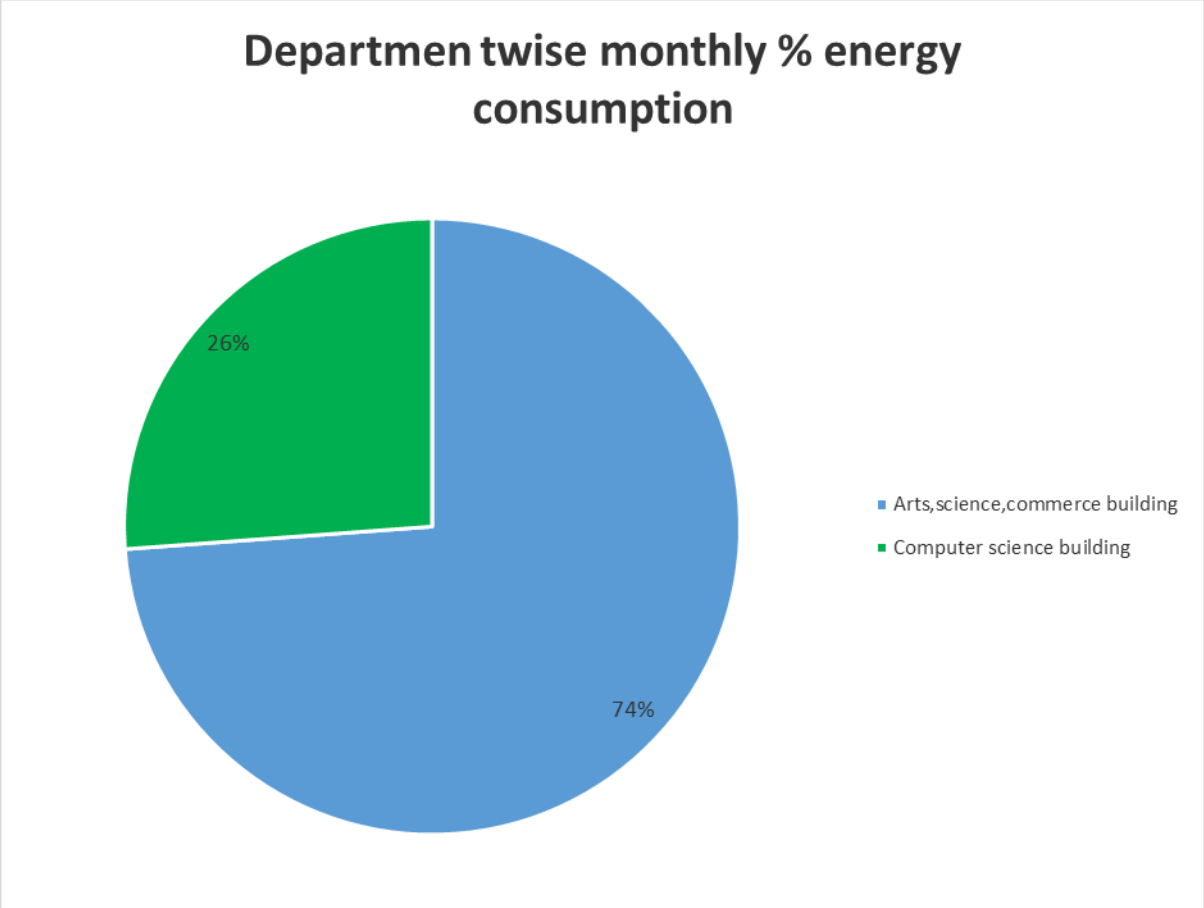
Meter No		160256413997					
BU		6410					
Connected load		30					kW
Contract demand		38					KVA
Meter		LT-VII-B-I, >20kW Public Services					
	Actual Demand	Total units	Demand Charges	Electricity duty	PF	Total Bill	Average Unit Rate
	KVA	kWh	INR/month	INR/month		INR/month	INR/kWh
Aug-20	7	3609	5430	7953.71	0.9	46515.67	12.89
Sep-20	15	4006	5430	8680.8	1	49333.88	12.31
Oct-20	16	1136	5430	3265.68	0.97	18877.12	16.62
Nov-20	13	1860	5430	4599.21	0.98	26525.83	14.26
Dec-20	12	1869	5430	4619.44	0.98	26642.65	14.26
Jan-21	14	2390	5430	5609.58	0.97	32270.82	13.50
Feb-21	16	2328	5430	5496.54	0.97	32104.32	13.79
Mar-21	17	2336	5430	5531.49	0.96	32185	13.78
Apr-21	16	2548	5430	5911.84	0.97	34267.08	13.45
May-21	16	1488	5595	3860.4	0.98	22250.86	14.95
Jun-21	9	1406	5596	3701.41	0.99	21154.23	15.05
Jul-21	16	2679	5595	6077.62	0.98	35094.62	13.10

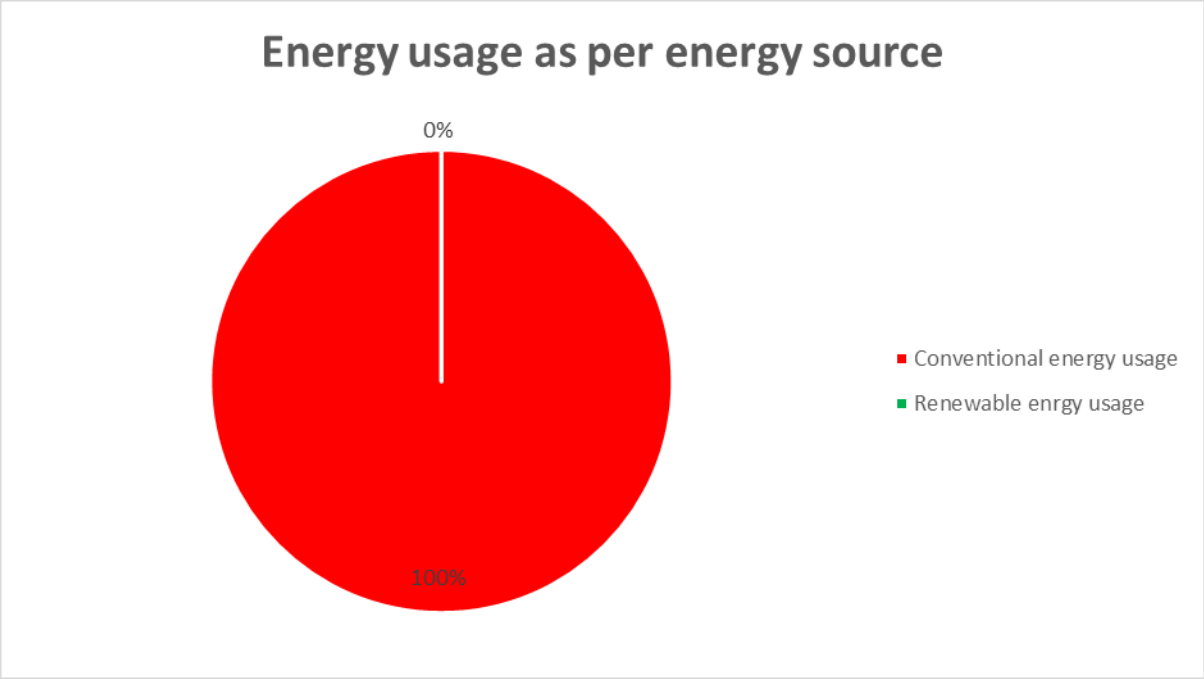
2. COMPUTER SCIENCE BUILDING

Meter No			160250084240				
BU			6410				
Connected load			30				kW
Contract demand			38				KVA
Meter			LT-VII-B-I, >20kW Public Services				
	Actual Demand	Demand Charges	Total units	Electricity duty	PF	Total Bill	Average Unit Rate
	KVA	INR/month	kWh	INR/month		INR/month	INR/kWh
Aug-20	2	5430	309	1697.54	0.78	10365.31	33.54
Sep-20	4	5430	653	2347.81	0.94	13652.21	20.91
Oct-20	5	5430	591	2240.09	0.85	13339.72	22.57
Nov-20	4	5430	525	2106	0.91	12235.72	23.31
Dec-20	3	5430	556	2162.42	0.91	12565.52	22.60
Jan-21	5	5430	820	2669.33	0.91	15454.56	18.85
Feb-21	9	5430	893	2808.6	0.91	16434.9	18.40
Mar-21	6	5430	811	2659	0.93	15475.3	19.08
Apr-21	6	5430	798	2634.85	0.95	15333.71	19.22
May-21	6	5595	441	1962.55	0.96	11345.25	25.73
Jun-21	3	5595	345	1782.59	0.93	10336.78	29.96
Jul-21	7	5595	944	2894.84	0.95	16859.52	17.86

TOTAL DEPARTMENT WISE % ENERGY CONSUMPTION

Facility	Total units	Solar units generation	% of energy consumption
	kWh/month	kWh/month	%
Arts, science, commerce building	4230	0	73.83
Computer science building	1499	0	26.17
Total	**5729**	**0**	**100.00**





OBSERVATION

1. Total monthly average energy consumption of the college is more than 5500 units.
2. Total monthly billing is INR 50, 000 /-
3. Average unit rate of electricity for the college is 15 INR/kWh
4. No Solar Photovoltaic system is installed in the college for energy generation.

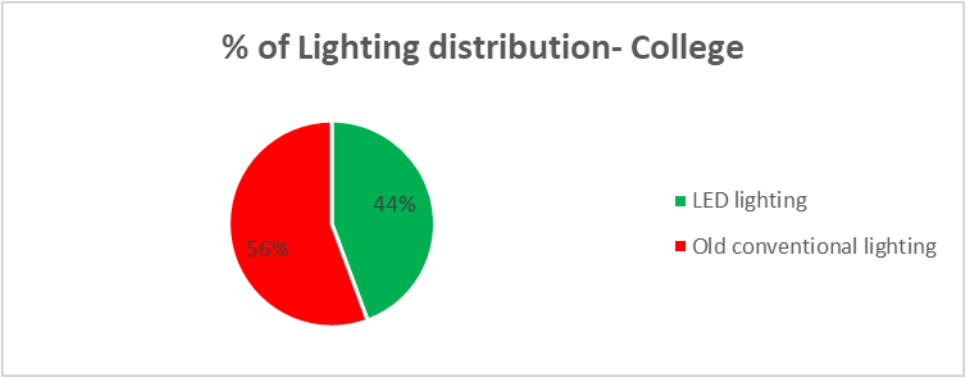
ENERGY PERFORMANCE ASSESSMENT OF LIGHTING

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	259	4.66	44.35
Old conventional lighting	325	11.70	55.65
Total	**584**	**16.36**	**100**



PERFORMANCE ASSESSMENT OF LIGHTING SYSTEM

Name/Location	Light Type	Type	Qty	Wattage	Hours of usage	No of Days in a month	Monthly consumption
			Nos	watt	hrs	days	kWh/day
11	FTL	1x36W	1	36	6	25	5.40
12	FTL	1x36W	1	36	6	25	5.40
14	FTL	1x36W	3	36	6	25	16.20
26	FTL	1x36W	1	36	6	25	5.40
27	CFL	1x36W	4	36	6	25	21.60
28	FTL	1x36W	2	36	6	25	10.80
31	FTL	1x36W	1	36	6	25	5.40
32	FTL	1x36W	1	36	6	25	5.40
33	FTL	1x36W	1	36	6	25	5.40
34	FTL	1x36W	1	36	6	25	5.40
36	FTL	1x36W	1	36	6	25	5.40
100	FTL	1x36W	2	36	6	25	10.80
101	LED	1x36W	2	36	6	25	10.80
102	FTL	1x36W	6	36	6	25	32.40
Language + Economics Dept.	FTL	1x36W	3	36	6	25	16.20
Placement Office	FTL	1x36W	1	36	6	25	5.40

Chemistry Dept.	FTL	1x36W	50	36	6	25	270.00
Office	FTL	1x36W	2	36	6	25	10.80
Principal Office	FTL	1x36W	4	36	6	25	21.60
Physics	FTL	1x36W	27	36	6	25	145.80
Library	CFL	1x36W	57	36	6	25	307.80
Zoology	LED	1x36W	13	36	6	25	70.20
Botany	LED	1x36W	10	36	6	25	54.00
Geology	LED	1x36W	6	36	6	25	32.40
Mathematics	LED	1x36W	3	36	6	25	16.20
Electronics	LED	1x36W	49	36	6	25	264.60
Computer Science	LED	1x36W	10	36	6	25	54.00
Gymkhana	LED	1x36W	14	36	6	25	75.60
History Dept.	LED	1x36W	2	36	6	25	10.80
Political Science Dept.	LED	1x36W	3	36	6	25	16.20
Examination Office	LED	1x36W	6	36	6	25	32.40
Junior College Office	LED	1x36W	2	36	6	25	10.80
Junior College VP office	LED	1x36W	3	36	6	25	16.20
Corridor 2nd Floor	LED	1x36W	1	36	6	25	5.40
Corridor 3rd Floor	LED	1x36W	5	36	6	25	27.00
Masjid	LED	1x36W	16	36	6	25	86.40
Security Room	LED	1x36W	1	36	6	25	5.40
Ground	LED	1x36W	3	36	6	25	16.20
Ladies Toilet	LED	1x36W	1	36	6	25	5.40
Gents Toilet	LED	1x36W	1	36	6	25	5.40
Stairs Main Building	LED	1x36W	1	36	6	25	5.40
Sensor Based Solar Light	LED	1x36W	4	36	6	25	21.60

ENERGY SAVING MEASURES

Name/Location	Change	New wattage	New used Qty	New monthly consumption	Monthly saving	Monthly saving	Investment	Total investment	Payback period
		watt	nos	kWh/month	kWh/month	INR/month	INR	INR	months
11	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
12	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
14	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
26	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
27	LED-1x18W	18	4	10.80	10.80	162.00	250	1000	6.17
28	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17
31	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
32	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
33	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
34	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
36	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
100	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17
101	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17
102	LED-1x18W	18	6	16.20	16.20	243.00	250	1500	6.17
Language + Economics Dept.	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
Placement Office	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Chemistry Dept.	LED-1x18W	18	50	135.00	135.00	2025.00	250	12500	6.17
Office	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17

Principal Office	LED-1x18W	18	4	10.80	10.80	162.00	250	1000	6.17
Physics	LED-1x18W	18	27	72.90	72.90	1093.50	250	6750	6.17
Library	LED-1x18W	18	57	153.90	153.90	2308.50	250	14250	6.17
Zoology	LED-1x18W	18	13	35.10	35.10	526.50	250	3250	6.17
Botany	LED-1x18W	18	10	27.00	27.00	405.00	250	2500	6.17
Geology	LED-1x18W	18	6	16.20	16.20	243.00	250	1500	6.17
Mathematics	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
Electronics	LED-1x18W	18	49	132.30	132.30	1984.50	250	12250	6.17
Computer Science	LED-1x18W	18	10	27.00	27.00	405.00	250	2500	6.17
Gymkhana	LED-1x18W	18	14	37.80	37.80	567.00	250	3500	6.17
History Dept.	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17
Political Science Dept.	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
Examination Office	LED-1x18W	18	6	16.20	16.20	243.00	250	1500	6.17
Junior College Office	LED-1x18W	18	2	5.40	5.40	81.00	250	500	6.17
Junior College VP office	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
Corridor 2nd Floor	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Corridor 3rd Floor	LED-1x18W	18	5	13.50	13.50	202.50	250	1250	6.17
Masjid	LED-1x18W	18	16	43.20	43.20	648.00	250	4000	6.17
Security Room	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Ground	LED-1x18W	18	3	8.10	8.10	121.50	250	750	6.17
Ladies Toilet	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Gents Toilet	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Stairs Main Building	LED-1x18W	18	1	2.70	2.70	40.50	250	250	6.17
Sensor Based Solar Light	LED-1x18W	18	4	10.80	10.80	162.00	250	1000	6.17
			325.00	877.50	877.50	13162.50		81250.00	6.17

Total lighting savings- College building and Other		
Monthly consumption	1755.00	kWh/month
New monthly consumption	877.5	kWh/month
New monthly saving	877.5	kWh/month
New monthly saving	13162.5	INR/month
Total Investment	81250	INR
Payback period	**6.17**	**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

Name/Location	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
11	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
12	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
13	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
14	1	65	5	25	8.13	28	3.50	4.63	2800	40.36
21	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
22	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
23	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
26	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
27	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
28	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
31	1	65	5	25	8.13	28	3.50	4.63	2800	40.36

32	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
33	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
34	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
36	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
37	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
38	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
39	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
40	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
41	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
42	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
43	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
44	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
100	1	65	5	25	8.13	28	3.50	4.63	2800	40.36
101	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
102	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
Language	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
Conference Hall	9	65	5	25	73.13	28	31.50	41.63	25200	40.36
Economics Dept.	1	65	5	25	8.13	28	3.50	4.63	2800	40.36
Chemistry Dept.	13	65	5	25	105.63	28	45.50	60.13	36400	40.36
Office	7	65	5	25	56.88	28	24.50	32.38	19600	40.36
Accounts	3	65	5	25	24.38	28	10.50	13.88	8400	40.36
VP (Arts) Office	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
Principal Office	7	65	5	25	56.88	28	24.50	32.38	19600	40.36
Commerce	4	65	5	25	32.50	28	14.00	18.50	11200	40.36
Physics	20	65	5	25	162.50	28	70.00	92.50	56000	40.36

Library	17	65	5	25	138.13	28	59.50	78.63	47600	40.36
Staff Room	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
Zoology	10	65	5	25	81.25	28	35.00	46.25	28000	40.36
Botany	10	65	5	25	81.25	28	35.00	46.25	28000	40.36
Geology	6	65	5	25	48.75	28	21.00	27.75	16800	40.36
Mathematics	2	65	5	25	16.25	28	7.00	9.25	5600	40.36
Statistics	3	65	5	25	24.38	28	10.50	13.88	8400	40.36
Electronics	16	65	5	25	130.00	28	56.00	74.00	44800	40.36
Computer Science	14	65	5	25	113.75	28	49.00	64.75	39200	40.36
Gymkhana	5	65	5	25	40.63	28	17.50	23.13	14000	40.36
Sociology	1	65	5	25	8.13	28	3.50	4.63	2800	40.36
Examination Office	3	65	5	25	24.38	28	10.50	13.88	8400	40.36
Junior College Office	1	65	5	25	8.13	28	3.50	4.63	2800	40.36
Junior College VP office	2	65	5	25	16.25	28	7.00	9.25	5600	40.36

Total fan savings- College building and other		
Monthly consumption	1779.38	kWh/month
New monthly consumption	766.5	kWh/month
New monthly saving	1012.88	kWh/month
New monthly saving	15193.2	INR/month
Total Investment	613200	INR
Payback period	**40.36**	**months**

ENERGY PERFORMANCE ASSESSMENT OF WATER PUMPING

OBSERVATION

1. There are five pumps operated in the college for gardening, drinking water and domestic purposes.

S. No	Type	Quantity	Pump HP	RPM
1	Water Pump	2	½ HP	2800
2	Water Pump	1	1 HP	2800
3	Water Pump Submersible	1	1 HP	2800
4	Water Pump	1	1.5 HP	2800
5	Water Pump Submersible	1	5 HP	2800

RECOMMENDATION

1. It is recommended that pump which is operated for maximum hours daily should run by automatic control panel with cyclic timer based.
2. 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.
3. This will save 20 to 30 % of energy in water pumping.

SAVING BY ELECTRICITY DUTY EXEMPTION

OBSERVATION

1. In electricity bill of hostel, college pays electricity duty. As per Maharashtra electricity duty act-1948 and revised-2016 it is exempted.

SAVINGS MEASURES

SAVINGS DUE TO ELECTRICITY DUTY

Saving by electricity duty exemption		
Average monthly electricity duty of the college	10000	INR/month
Investment	50000	INR
Simple payback period	**5**	**months**

SAVING BY REDUCING CONTRACT DEMAND

OBSERVATION

1. It is observed that contract demand of computer science building electricity bill is 38KVA.
2. But actual demand is 9 KVA maximum only.

RECOMMENDATION

1. It is recommended that to reduce the contract demand from 35 KVA to 22 KVA to save additional demand charges paid in electricity bill.

SAVINGS MEASURES

SAVINGS DUE TO CONTROLLING MAXIMUM DEMAND

Saving due to reducing contract demand		
Contract demand of the Arts, commerce college electricity bill	38	KVA
40% of contract demand	15	KVA
Actual average contract demand	9	KVA
Demand charges	373	INR/KVA
Fixed demand charges	5669.6	INR/month
New contract demand	22	KVA
40% new contract demand	9	INR/month
New demand charges	3282.4	INR/month
Saving in demand charges	2387.2	INR/month
Investment	10000	INR
Payback period	**4.19**	**months**

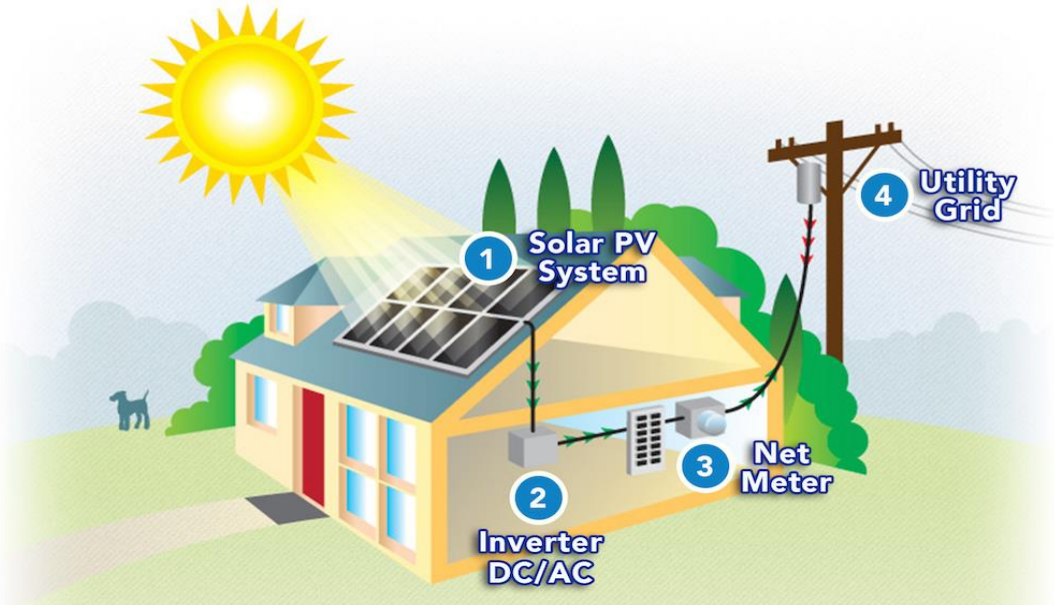
SOLAR PV SYSTEM WITH NET METER

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

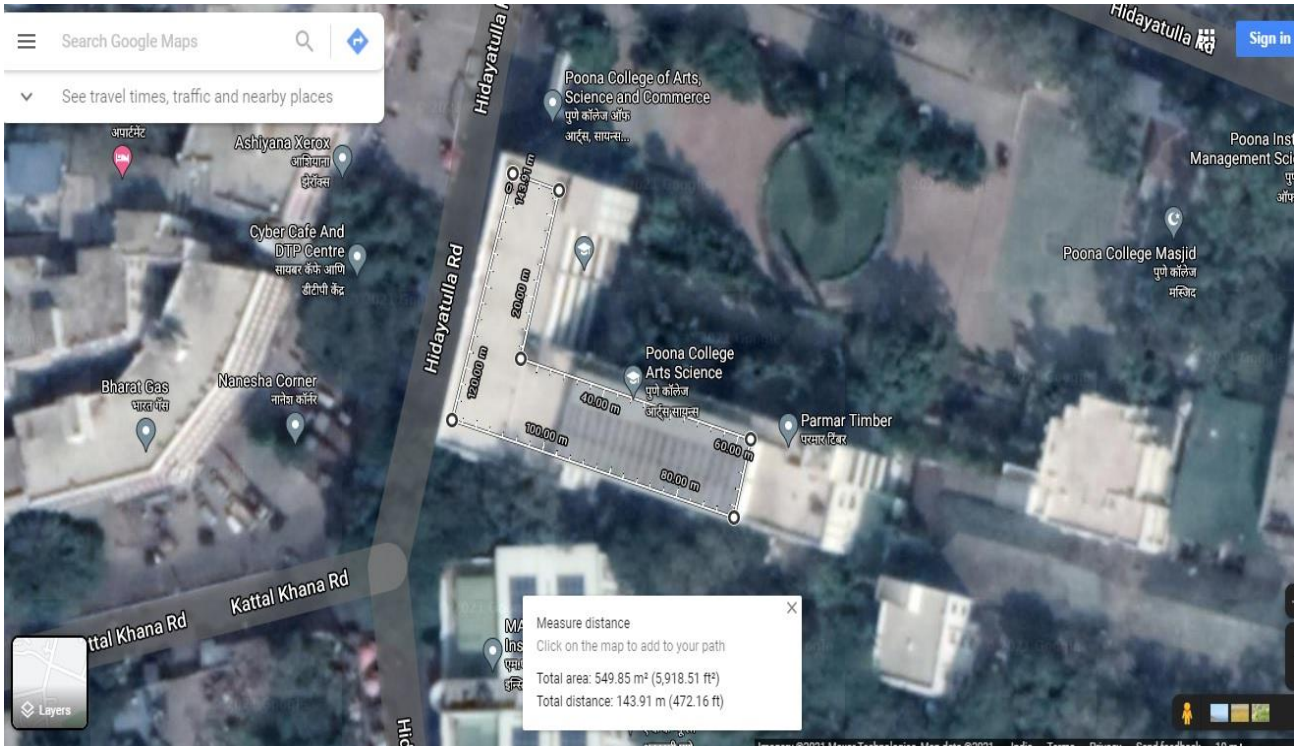
1. It is observed that in the college Solar PV system is not installed for solar energy generation.
2. Both the main building and computer science building of college has large amount of rooftop space available for Solar PV system installation.

RECOMMENDATION

1. College has two rooftops available on two building with two separate MSEDCL electricity connections.
2. College can installed two different sizes of Solar PV system on rooftops as per energy consumption and rooftop space available.

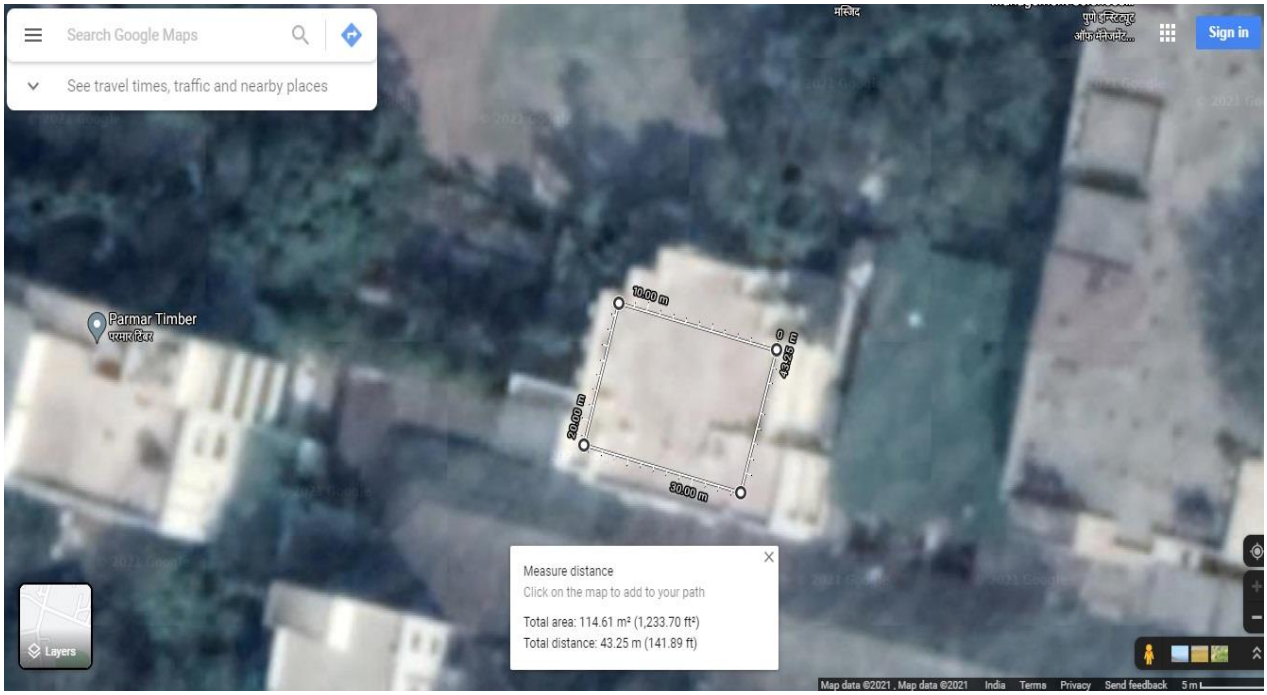
SAVINGS MEASURES

SAVINGS DUE TO SOLAR PV SYSTEM INSTALLATION- MAIN COLLEGE BUILDING



Savings due to Solar PV system installation-Main college building		
Rooftop space available on main college building	5900	sqfoot
Average energy consumption of main college building	4200	kWh/month
Total capacity of Solar PV system can be installed	30	kWp
Total solar unit generation	3375	kWh/month
Average electricity unit rate	15	INR/kWh
Total cost of Solar PV system	1950000	INR
Total saving	50625	INR/month
Payback period	38.52	months
Payback period	**3.21**	**year**

SAVINGS DUE TO SOLAR PV SYSTEM INSTALLATION- COMPUTER SCIENCE BUILDING



Savings due to Solar PV system installation-Computer science building		
Rooftop space available on Computer science building	1200	sqfoot
Average energy consumption of Computer science building	1500	kWh/month
Total capacity of Solar PV system can be installed	12	kWp
Total solar unit generation	1350	kWh/month
Average electricity unit rate	15	INR/kWh
Total cost of Solar PV system	780000	INR
Total saving	20250	INR/month
Payback period	38.52	months
Payback period	**3.21**	**year**

SAVING BY BO GAS PLANT

OBSERVATION

1. In the college canteen approximately 10kg kitchen waste is generated daily.
2. Currently there is no any bio gas plant for generation of bio gas in the college.

RECOMMENDATION

1. It is recommended that installed the small capacity of bio gas plant at college canteen for production of bio gas from kitchen waste generated daily.
2. Produced bio gas can be used for small purposes in the canteen instead of LPG which saves monthly approximate one cylinder of INR1,000/-

SAVINGS MEASURES

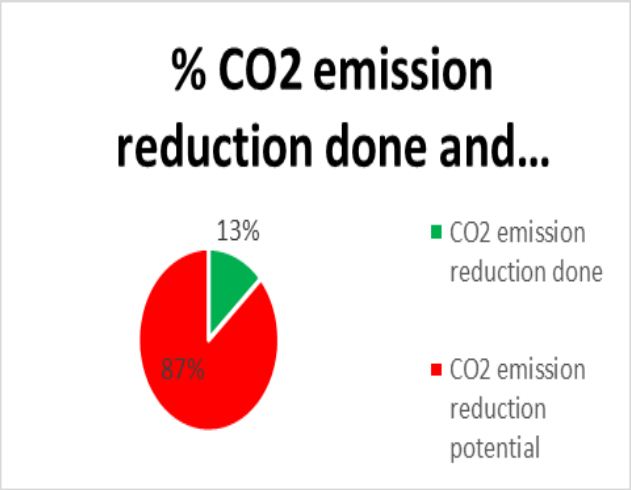
SAVINGS DUE TO BIO GAS PLANT

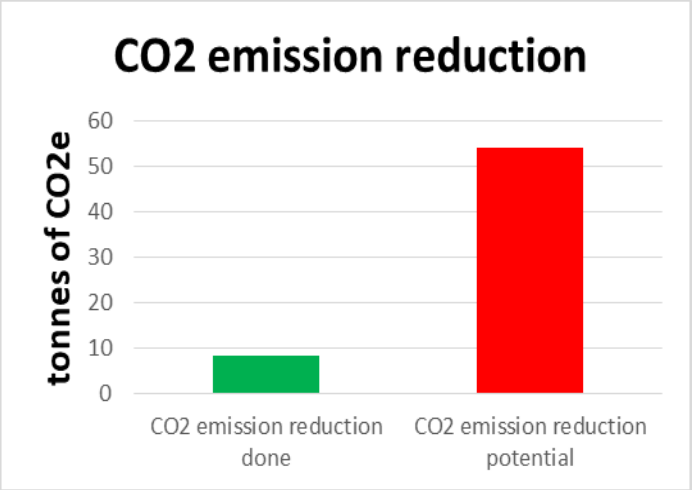
Saving due to Bio gas plant		
Capacity of bio gas plant	10	kg/day
Waste generated	10	kg/day
Approximate bio gas generation	1	m3/day
Approximate bio gas generation	30	m3/month
Equivalent LPG gas saved	12	kg/month
Approximate LPG cylinder saved	1.0	nos
Cost saved	**1000.00**	**INR/month**

CO_2 EMISSION REDUCTION

CO2 emission reduction done due to new energy efficient and renewable energy		
Energy saved by new energy efficient technology	815.5	kWh/month
Energy saved by energy efficient technology	9786	kWh/year
Energy saved by renewable energy- solar	0	kWh/month
Energy saved by renewable energy- solar	0	kWh/year
CO2 emission reduction done	**8.32**	**tonnes of CO2e**

CO2 emission reduction potential		
Energy saving potential by energy saving/conservation	1891.38	kWh/month
Energy saving potential by energy saving/conservation	22696.56	kWh/year
Energy saving potential by renewable energy-solar	5287.50	kWh/month
Energy saving potential by renewable energy-solar	63450	kWh/year
CO2 emission reduction potential	**53.93**	**tonnes of CO2e**





ENERGY CONSERVATION BY SAVING OF WATER

1. TAP WATER REDUCER

Conventional Tap water system	Tap water system with Reducer
	
College have installed tap water system at laboratories except other places like bathrooms, kitchen etc	**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**