ENERGY AUDIT REPORT

AHMEDNAGAR DISTRICT MARATHA SAMAJ SEVA PRASARAK'S

NEW ARTS, COMMERCE AND SCIENCE COLLEGE, PARNER

TALUKA-PARNER, DISTRICT-AHMEDNAGAR

Maharashtra 414302

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Conducted and Submitted by

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ENERFUTURE

CERTIFICATE

ENERFUTURE TECHNOLOGY PRIVATE LIMITED

Verified and Certified that

NEW ARTS, COMMERCE AND SCIENCE COLLEGE,

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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 2021-22.

ENERFUTURE TECHNOLOGY PRIVATE LIMITED ★ PUNE ★

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ACKNOWLEDGEMENT

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

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

Name	Designation
Prof. Dr. R. K. Aher	Principal
Prof. Dr. D. R. Thube	Vice-Principal

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(pursuing), BEE Certified Energy Manager
2	Mr Vinay Mulay	M.Tech (Energy Studies), ISO 50001 Lead Auditor, BEE Accredited Energy Auditor
3	Mr YogeshKuwar	M.Tech (Energy Studies), IGBC IGBC Accredited Professional, Post Graduate Diploma in Environmental law and Policy (PGDELP), BEE Certified Energy Manager
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
6	Mr Anil Yeole	ISO Lead Auditor, M.Com, P.G.D.B.M., G.D.C&A.

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 other	Lightning recommendations	Replace existing old conventional 1x36W with new energy efficient 1x18W LED tube light battens	Existing lighting consumption= 816.80kWh Expected energy consumption= 428.4kWh Total energy saved per month=388.4kWh	388.4	4660.8	49,000	10.51
	Girl's and Boy's Hostel	Lightning recommendations	Replace existing old conventional 1x36W with new energy efficient 1x18W LED tube light battens	Existing lighting consumption= 270.90kWh Expected energy consumption= 135.40kWh Total energy saved per month=135.40kWh	135.4	1625.4	10,750	6.61
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= 1571.38kWh Expected energy consumption= 673.90kWh Total energy saved per month=897.48kWh	897.48	10769.76	5,93,600	55.12
	Girl's and Boy's	Fan recommendations	Replace existing old conventional fans which	Existing fan consumption= 978.25kWh	556.85	6682.2	2,40,800	36.04

	Hostel		consumes 65W with new energy efficient fans which consumes 28W(18W & 8W for exhaust fan)	Expected energy consumption= 421.40kWh Total energy saved per month=556.85kWh				
3	College	Water pumping system	Install the cyclic timer for water pump operating for 24 hours daily so that it will be operates 1 hours ON and half an hour OFF	Existing water pump consumption= 951.6kWh Expected energy consumption= 634.4kWh Total energy saved per month=317.20kWh	317.2	3806.4	10,000	3
4	College	Electricity bills-All	Change existing MSEDCL commercial tariff to Public services-others which is applicable	Total energy saved per month=INR6648	-	6648	75,000	11.28
		Electricity bills-All	As per Maharashtra electricity duty act-1948 and revised-2016 electricity duty is exempted for colleges, its hostels etc	Average monthly electricity duty =INR4000	-	4000	40,000	10
		Electricity bills-Arts and Commerce college building`	Reduced the contract demand from 35KVA to 22KVA	Average demand charges saved =INR1939.6	-	1939.6	10,000	5.16
5	Arts and Commerce college building1	Solar PV system	Rectify the existing Solar PV system for its civil foundation as well as DC cable string connections	Average monthly saving=INR1000	-	1000	5,000	5

6	Hostel1	Excess demand charges/penalty	Maintained the maximum demand at hostel to avoid excess demand penalty	Average monthly saving=840kWh	840	10080	75,000	0
		Total			**3135.33**	**51212.16**	**1109150**	**22**

COLLEGE INTRODUCTION

INTRODUCTION

New Arts, Commerce and Science College, Parner established in July 1977 is one of the leading colleges in the SPPU region. It is affiliated to Savitribai Phule Pune University, Pune and recognised under 2(f) and 12(B) of the UGC.

The college has figured in rank band of 101-150 in the NIRF rankings 2017 released on 3rd April 2017 by National Institutional Ranking Framework, Ministry of Human Resource Development and GoI.

The college is recipient of Best College Award 2014 given by SPPU. The College is recipient of fifteen state and university level awards during last five years for its excellence in academic, social activities, performance of NSS, NCC, and Students Welfare Board and for its college magazine Chetana.

More than 24 SPPU academic rankers in the last four years indicate the quality of teaching, learning imparted in the college. During the last four decades, the college has made a great contribution to the educational and social development of the Parner tahasil. Fortunately, Parner is blessed with the philosophy of social workers like Padmabhushan Anna Hazare and Popatrao Pawar.

The college has a clean and beautiful campus of 11.4 acres with adequate plantation despite meagre rainfall.

There has been continuous extension and up gradation of infrastructure in terms of classrooms, laboratories, library, gymnasium, hostels, seminar halls, auditorium, guesthouse, equipment, instruments, language laboratory, etc.
The college library is one of the best centres for reference and information in the region. It has more than 41843 books, 61 journals and 452 CD/DVDs.
The present student enrolment is 2416. The total number of programmes offered at present is 42 which include 15 UG, 11 PG, 02 research centres and 14 certificate courses.
The college has continuously upgraded its academic profile with new academic programmes as per the need of the time and to make available the new avenues of career options to students.
Most of the UG academic programmes have been subsequently extended to PG and further to research programmes to ensure progression to higher levels.
During the last five years 02 UG programmes, 07 PG programmes and 02 research centres and 12 certificate courses have been newly introduced.
The college has invested enormous amount to create required infrastructure to run them efficiently.
Over the years, the college has maintained its distinct position in introducing new academic programmes with immediate effect as and when designed and approved by the university.
A wide range of programmes has provided greater need based choices to the students.

VISSION

To make social development through quality education to poor and socioeconomically deprived masses and rural youth.

MISSION

To make all round personality development of students through disciplined teaching-learning process.

OBJECTIVES

- To encourage students in general and girls in particular for quality teaching-learning processes.
- To inculcate scientific temper and humanitarian approach among society in general and students in particular.
- To encourage students to learn modern techniques and methodologies.
- To inculcate values and social responsibilities among students.
- To address to the global and local needs to.

LOCATION


State Bank of India
Parner College Rd
New English School & Junior College
Bank Of Baroda
Cafe Creme
Takeout
New Arts, Commerce and Science College, Parner
Parner College Rd
Science Building
Church Rd
Vishnuharta Hospital
Hotel Gaurav
Layers
Google

ELECTRICITY BILL SUMMARY

New arts, commerce and science college, Parner have number of MSEDCL three phase and single LT electricity connections in the Admin building, Science building, Arts and commerce building, Girls's and Boy's hostel.

The major electricity consumption in college building is lighting, fans as well as water pumping to various buildings during college hours. In hostel lighting, fans are main electricity consuming utilities.

ELECTRICITY BILL SUMMARY

1. SCIENCE BUILDING-1

Meter No	150520095693			
BU	6718			
Connected load	1			kW
Meter	LT-II-B,0-20, Commercial			
	Total units	Electricity duty	Total Bill	Average Unit Rate
	kWh	INR/month	INR/month	INR/kWh
Jun-20	12	22.2	245.23	20.44
Jul-20	891	1740.94	10124.7	11.36
Aug-20	337	708.11	4297.65	12.75
Sep-20	760	1490.71	5243.4	6.90
Oct-20	640	1268.69	7461.9	11.66
Nov-20	643	1274.24	7461.37	11.60
Dec-20	554	1109.59	6493.13	11.72
Jan-21	564	1128.09	6601.49	11.70
Feb-21	587	1170.64	6850.77	11.67
Mar-21	587	1170.64	6850.77	11.67
Apr-21	2858	5362.22	31410.64	10.99
May-21	1141	2138.21	12525.55	10.98
Average	**798**	**1549**	**8797**	**11.98**

2. SCIENCE BUILDING-2

Meter No	150520095707			
BU	6718			
Connected load	9			kW
Meter	LT-II-B,0-20, Commercial			
	Total units	Electricity duty	Total Bill	Average Unit Rate
	kWh	INR/month	INR/month	INR/kWh
Jun-20	50	92.51	632.28	12.65
Jul-20	1616	2999.28	17712	10.96
Aug-20	404	832.07	4988.2	12.35
Sep-20	1032	1993.93	11808.95	11.44
Oct-20	452	920.88	5416.94	11.98
Nov-20	201	456.5	2673.15	13.30
Dec-20	184	425.05	2482.26	13.49
Jan-21	219	489.8	2861.63	13.07
Feb-21	201	456.5	2666.56	13.27
Mar-21	201	456.5	2666.49	13.27
Apr-21	1436	2736.58	13289.79	9.25
May-21	552	1079.43	6318.91	11.45
Average	**546**		**6126**	**12.21**

3. ARTS AND COMMERCE BUILDING

Meter No		150528020820			
BU		6718			
Connected load		30			kW
Meter		LT-VII-B-I, >20kW Services Public			
	Actual Demand	Total units	Electricity duty	Total Bill	Average Unit Rate
	KVA	kWh	INR/month	INR/month	INR/kWh
May-20	7	174	483.88	2980.7	17.13
Jun-20	7	67	186.71	1154.54	17.23
Jul-20	11	237	1809.46	10770.19	45.44
Aug-20	9	62	1357.6	8027.44	129.47
Sep-20	9	149	1584.1	9342.83	62.70
Oct-20	0	75	1393.82	8110.94	108.15
Nov-20	5	72	1385.46	7995.86	111.05
Dec-20	6	108	1485.78	8580.38	79.45
Jan-21	10	95	962.73	7147.31	75.23
Feb-21	6	70	922.77	6818.02	97.40
Mar-21	9	87	949.94	7437.07	85.48
Apr-21	8	73	949.52	6986.16	95.70
Average		**106**	**1123**	**7113**	**77.04**

4. GIRLS'S HOSTEL

Meter No	150520930193			
BU	6718			
Connected load	7.5			kW
Meter	LT-II-B,0-20, Commercial			
	Total units	Electricity duty	Total Bill	Average Unit Rate
	kWh	INR/month	INR/month	INR/kWh
May-20	30	55.5	325.51	#REF!
Jun-20	160	284.9	1045.25	6.53
Jul-20	0	0	954.05	#DIV/0!
Aug-20	0	0	954.05	#DIV/0!
Sep-20	0	0	954.05	#DIV/0!
Oct-20	0	0	403	#DIV/0!
Nov-20	0	0	403	#DIV/0!
Dec-20	0	0	403	#DIV/0!
Jan-21	0	0	403	#DIV/0!
Feb-21	0	0	403	#DIV/0!
Mar-21	0	0	403	#DIV/0!
Apr-21	139	337.02	1968.33	14.16
Average	**27**		**718**	**#REF!**

5. BOY'S HOSTEL

Meter No	150520936451			
BU	6718			
Connected load	1			kW
Meter	LT-II-B,0-20, Commercial			
	Total units	Electricity duty	Total Bill	Average Unit Rate
	kWh	INR/month	INR/month	INR/kWh
Jul-20	5	9.25	57.49	11.50
Aug-20	50	177.14	1033.86	20.68
Sep-20	50	177.14	1029.64	20.59
Oct-20	50	177.14	1029.64	20.59
Nov-20	50	177.14	1029.64	20.59
Dec-20	50	177.14	1029.64	20.59
Jan-21	50	177.14	1024.64	20.49
Feb-21	50	177.14	1029.64	20.59
Mar-21	50	177.14	1029.64	20.59
Apr-21	50	177.12	1029.57	20.59
May-21	50	177.03	1029.03	20.58
Jun-21	50	177.03	1029.03	20.58
Average	**46**	**163**	**948**	**19.83**

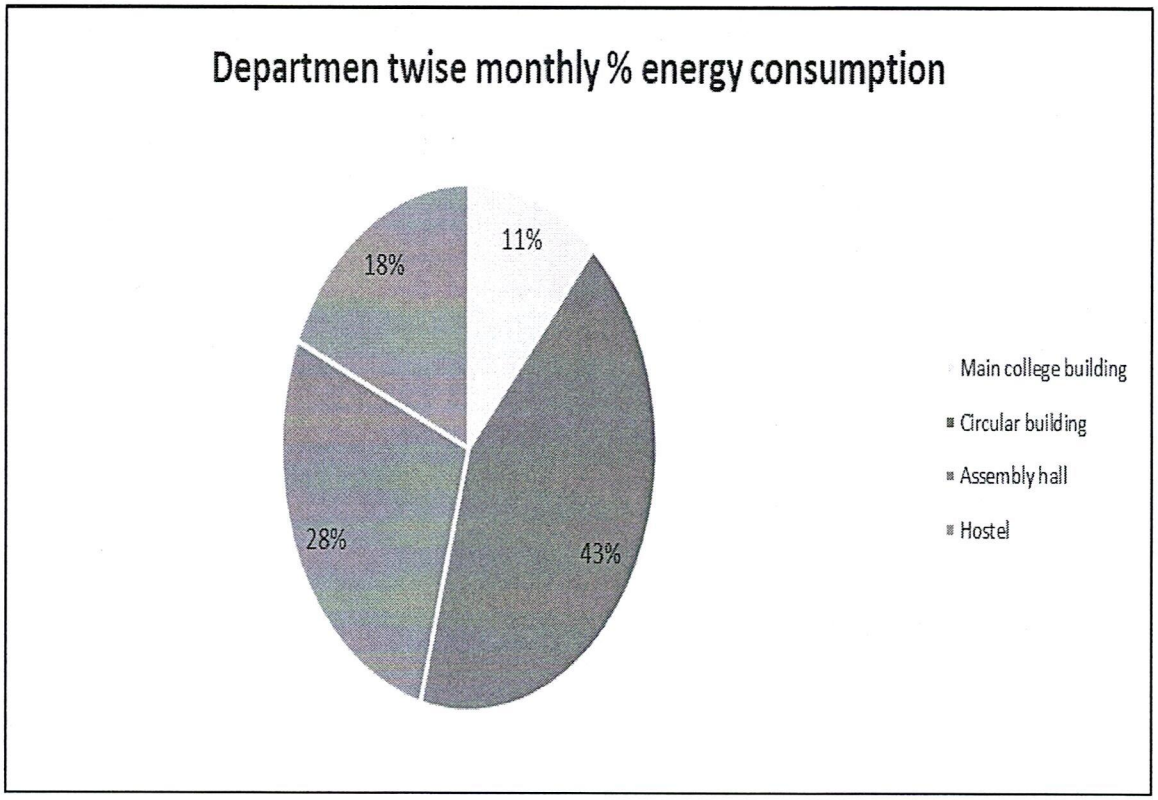
6. OTHER

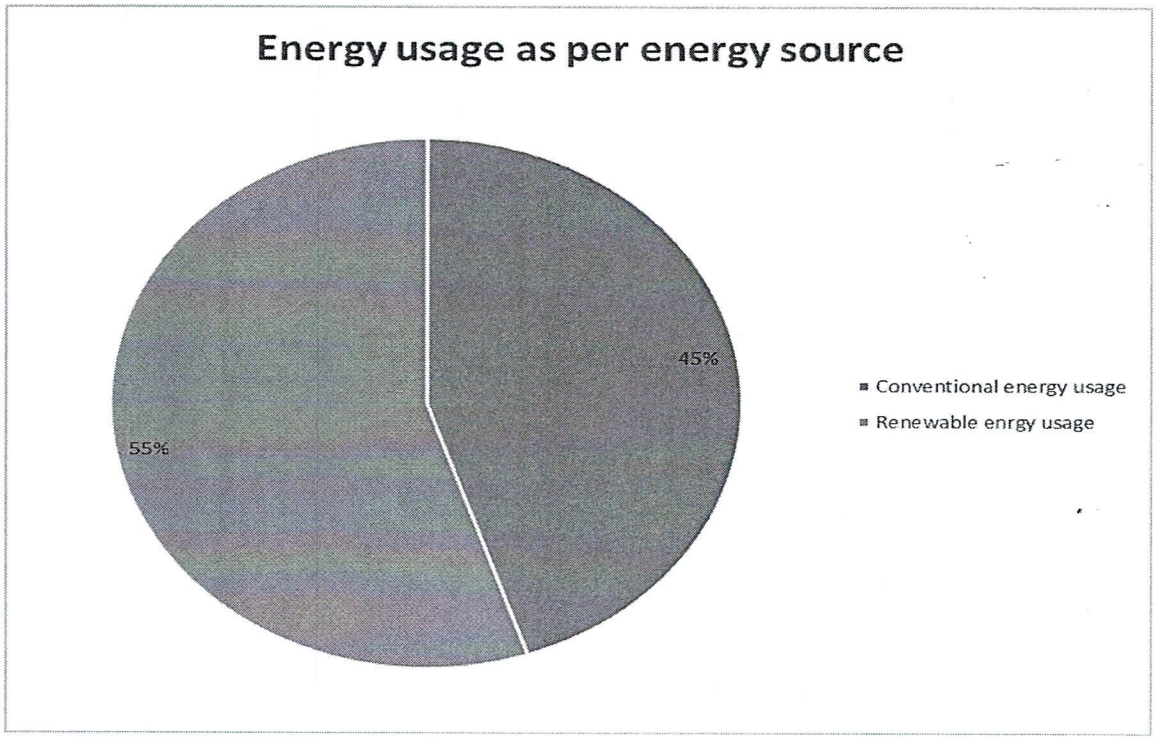
Meter No	150520906951			
BU	6718			
Connected load	0.5			kW
Meter	LT-II-B,0-20, Commercial			
	Total units	Electricity duty	Total Bill	Average Unit Rate
	kWh	INR/month	INR/month	INR/kWh
Jul-20	148	273.81	1615.4	10.91
Aug-20	203	460.2	2703.31	13.32
Sep-20	419	859.82	5073.64	12.11
Oct-20	189	434.3	2551.69	13.50
Nov-20	189	434.3	2540.47	13.44
Dec-20	674	1331.6	7821.39	11.60
Jan-21	247	541.6	3140.43	12.71
Feb-21	238	524.95	3067.57	12.89
Mar-21	247	541.6	3165.13	12.81
Apr-21	248	542.74	3171.85	12.79
May-21	94	256.12	1492.68	15.88
Jun-21	46	169.84	986.88	21.45
Average	**245**		**3111**	**13.62**

Meter No	150520106865		
BU	6718		
Connected load	1.13		kW
Meter	LT1 Residential 1 phase		
	Total units	Total Bill	Average Unit Rate
	kWh	INR/month	INR/kWh
Jul-20	63	474.82	7.54
Aug-20	32	298.26	9.32
Sep-20	84	594.43	7.08
Oct-20	60	457.74	7.63
Nov-20	60	457.74	7.63
Dec-20	60	457.74	7.63
Jan-21	60	457.74	7.63
Feb-21	401	2399.94	5.98
Mar-21	9	168.64	18.74
Apr-21	7	156.03	22.29
May-21	1	123.91	123.91
Jun-21	9	168.64	18.74
Average	**71**	**518**	**20.34**

TOTAL DEPARTMENT WISE % ENERGY CONSUMPTION

Facility	Total units	Solar units generation	% of energy consumption
	kWh/month	kWh/month	%
	1459	0	70.79
	180	720	8.73
	106	1500	5.14
	316	320	15.33
Total	2061	2540	Science building
			Girl's and Boy's hostel
			Arts, commerce building
			Admin building and other





OBSERVATION

1. Total monthly energy consumption of the college is more than 3000 units.
2. Total monthly billing is INR 30, 000 /-
3. 21 kWp Solar PV system is installed in Arts and commerce college building as a renewable energy source.
4. 7.2 kWp Solar PV system is installed in Girl's hostel building as a renewable energy source.
5. 3 kWp Solar PV system is installed in Admin building as a renewable energy source
6. Bio-gas plant is also installed in hostel for cooking purpose.

RECOMMENDATION

1. Energy meter management is very poor. So it is recommended that rearrange the energy meter in the college.

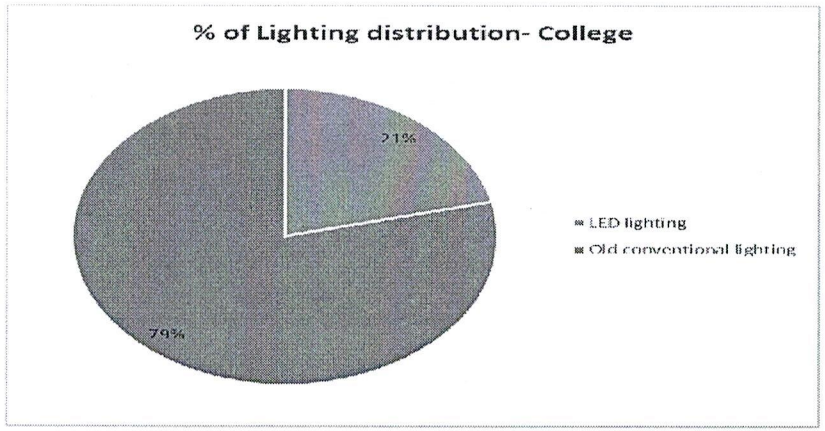
ENERGY PERFORMANCE ASSESSMENT OF LIGHTING

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	58	0.87	21.25
Old conventional lighting	215	7.74	78.75
Total	**273**	**8.61**	**100**



PERFORMANCE ASSESSMENT OF LIGHTING SYSTEM

Building	Name	Light Type	Type	Qty	Wattage	Hours of usage	No of Days in a month	Monthly consumption
				Nos	watt	hrs	days	kWh/day
Science building	Physical chemical lab	FTL	1x36W	3	36	5	25	13.50
	PG analytical lab-Inorganic	FTL	1x36W	3	36	5	25	13.50
	General chemical lab	FTL	1x36W	4	36	5	25	18.00
	PG organic lab	FTL	1x36W	4	36	5	25	18.00
	S.I. lab	CFL	1x24W	4	24	5	25	12.00
	Research lab	FTL	1x36W	4	36	5	25	18.00
	Analytical instrumentation lab	FTL	1x36W	2	36	5	25	9.00
	Physics general lab	FTL	1x36W	2	36	5	25	9.00
		CFL	1x24W	4	24	5	25	12.00
	Physics PG lab	FTL	1x36W	3	36	5	25	13.50
	Computer lab-1	FTL	1x36W	2	36	5	25	9.00
	Computer lab-2	FTL	1x36W	5	36	5	25	22.50
	Computer lab-3	FTL	1x36W	2	36	5	25	9.00
	Physics research lab	FTL	1x36W	2	36	5	25	9.00
	Vocational lab	FTL	1x36W	2	36	5	25	9.00
	Botany PG lab	FTL	1x36W	3	36	5	25	13.50
	Botany general lab	FTL	1x36W	6	36	5	25	27.00
	Zoology lab-1	FTL	1x36W	3	36	5	25	13.50

	Zoology lab-2	FTL	1x36W	2	36	5	25	9.00
	Botany research lab	FTL	1x36W	3	36	5	25	13.50
	Office	FTL	1x36W	2	36	5	25	9.00
	Passage	FTL	1x36W	6	36	5	25	27.00
		LED	1x18W	2	18	5	25	4.50
	4 Class rooms	FTL	1x36W	20	36	5	25	90.00
	12 Class rooms	LED	1x18W	24	18	5	25	54.00
Arts, commerce building	English lab	FTL	1x36W	2	36	5	25	9.00
	English class	FTL	1x36W	2	36	5	25	9.00
	BCA lab	FTL	1x36W	4	36	5	25	18.00
	Geography lab-1	FTL	1x36W	2	36	5	25	9.00
	Geography lab-2	FTL	1x36W	2	36	5	25	9.00
	20 Class rooms	FTL	1x36W	20	36	5	25	90.00
	Gymkhana	FTL	1x36W	4	36	5	25	18.00
	Sabhagruh	FTL	1x36W	6	36	5	25	27.00
	Examination section	FTL	1x36W	4	36	5	25	18.00
	Office	FTL	1x36W	16	36	5	25	72.00
	Library	FTL	1x36W	7	36	5	5	6.30
	Reading hall	FTL	1x36W	13	36	5	25	58.50
Admin building	Office	CFL	1x24W	6	24	5	25	18.00
	Principal office	LED	1x12W	8	12	5	25	12.00
		LED	1x18W	2	18	5	25	4.50
	IQC meeting	LED	1x12W	4	12	5	25	6.00
		LED	1x18W	2	18	5	25	4.50
	Vice principal office	LED	1x12W	4	12	5	25	6.00
	APJ kalam hall	CFL	1x24W	13	24	5	25	39.00

	Language lab	LED	1x18W	8	18	5	25	18.00
	Virtual class room	LED	1x12W	4	12	5	25	6.00
	Girl's reading room	FTL	1x36W	4	36	5	25	18.00

ENERGY SAVING MEASURES

Building	Name	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
Science building	Physical chemical lab	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	PG analytical lab-Inorganic	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	General chemical lab	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	PG organic lab	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	S.I. lab	LED-1x18W	18	4	9.00	3.00	36.00	250	1000	27.78
	Research lab	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	Analytical instrumentation lab	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Physics general lab	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
		LED-	18	4	9.00	3.00	36.00	250	1000	27.78

		1x18W								
	Physics PG lab	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	Computer lab-1	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Computer lab-2	LED-1x18W	18	5	11.25	11.25	135.00	250	1250	9.26
	Computer lab-3	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Physics research lab	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Vocational lab	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Botany PG lab	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	Botany general lab	LED-1x18W	18	6	13.50	13.50	162.00	250	1500	9.26
	Zoology lab-1	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	Zoology lab-2	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Botany research lab	LED-1x18W	18	3	6.75	6.75	81.00	250	750	9.26
	Office	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Passage	LED-1x18W	18	6	13.50	13.50	162.00	250	1500	9.26
	4 Class rooms	LED-1x18W	18	20	45.00	45.00	540.00	250	5000	9.26

Arts, commerce building	English lab	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	English class	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	BCA lab	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	Geography lab-1	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	Geography lab-2	LED-1x18W	18	2	4.50	4.50	54.00	250	500	9.26
	20 Class rooms	LED-1x18W	18	20	45.00	45.00	540.00	250	5000	9.26
	Gymkhana	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	Sabhagruh	LED-1x18W	18	6	13.50	13.50	162.00	250	1500	9.26
	Examination section	LED-1x18W	18	4	9.00	9.00	108.00	250	1000	9.26
	Office	LED-1x18W	18	16	36.00	36.00	432.00	250	4000	9.26
	Library	LED-1x18W	18	7	3.15	3.15	37.80	250	1750	46.30
	Reading hall	LED-1x18W	18	13	29.25	29.25	351.00	250	3250	9.26
Admin building	Office	LED-1x18W	18	6	13.50	4.50	54.00	250	1500	27.78
	APJ kalam hall	LED-1x18W	18	13	29.25	9.75	117.00	250	3250	27.78
	Girl's reading room	LED-	18	4	9.00	9.00	108.00	250	1000	9.26

		1x18W								

Total lighting savings- College building and Other		
Monthly consumption	816.80	kWh/month
New monthly consumption	428.4	kWh/month
New monthly saving	388.4	kWh/month
New monthly saving	4660.8	INR/month
Total Investment	49000	INR
Payback period	**10.51**	**months**

ENERGY SAVING MEASURES- OTHER RECOMMENDATIONS

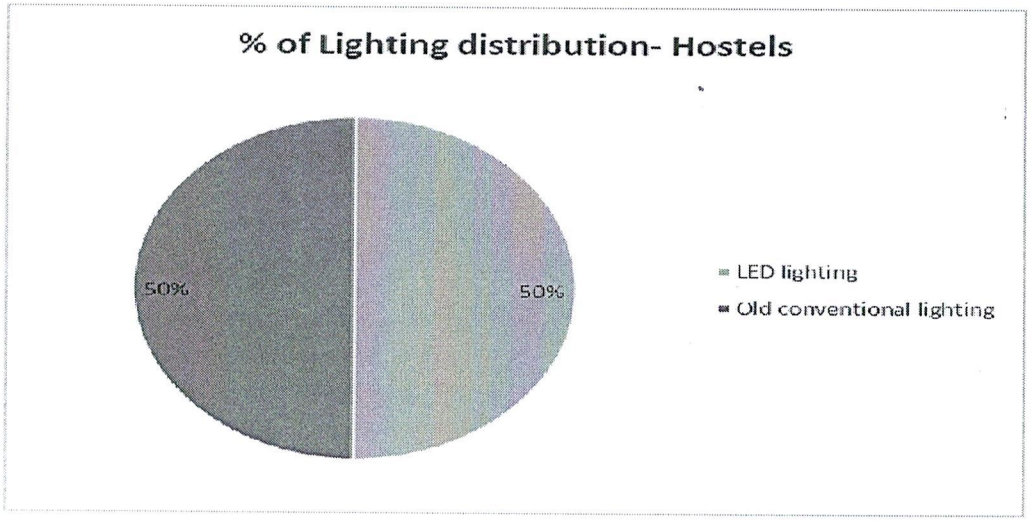
College can installed motions sensor LED tube lights or bulbs where lighting is on for maximum period and occupancy or motion is less. This save additional energy by automatic switching of lighting.

2. GIRL'S AND BOY'S HOSTEL

OBSERVATION

Hostel has installed new energy efficient LED as well as old conventional lightings.

Type	Quantity	kW load	% of load
LED lighting	43	0.77	50.00
Old conventional lighting	43	1.55	50.00
Total	**86**	**2.32**	**100**



PERFORMANCE ASSESSMENT OF LIGHTING SYSTEM

Building	Room	Name	Light Type	Type	Qty	Wattage	Hours of usage	No of Days in a month	Monthly consumption
					Nos	watt	hrs	days	kWh/day
Girl's hostel	1	Room 1	FTL	1x36W	1	36	7	25	6.30
	2	Room 2	FTL	1x36W	1	36	7	25	6.30
	3	Room 3	FTL	1x36W	1	36	7	25	6.30
	4	Room 4	FTL	1x36W	1	36	7	25	6.30
	5	Room 5	FTL	1x36W	1	36	7	25	6.30
	6	Room 6	FTL	1x36W	1	36	7	25	6.30
	7	Room 7	FTL	1x36W	1	36	7	25	6.30
	8	Room 8	FTL	1x36W	1	36	7	25	6.30
	9	Room 9	FTL	1x36W	1	36	7	25	6.30
	10	Room 10	FTL	1x36W	1	36	7	25	6.30
	11	Room 11	FTL	1x36W	1	36	7	25	6.30
	12	Room 12	FTL	1x36W	1	36	7	25	6.30
	13	Room 13	FTL	1x36W	1	36	7	25	6.30
	14	Room 14	FTL	1x36W	1	36	7	25	6.30
	15	Room 15	FTL	1x36W	1	36	7	25	6.30
	16	Room 16	FTL	1x36W	1	36	7	25	6.30
	17	Room 17	FTL	1x36W	1	36	7	25	6.30

	18	Room 18	FTL	1x36W	1	36	7	25	6.30
	19	Room 19	FTL	1x36W	1	36	7	25	6.30
	20	Room 20	FTL	1x36W	1	36	7	25	6.30
	21	Room 21	FTL	1x36W	1	36	7	25	6.30
	22	Room 22	FTL	1x36W	1	36	7	25	6.30
	23	Room 23	FTL	1x36W	1	36	7	25	6.30
	24	Room 24	FTL	1x36W	1	36	7	25	6.30
	25	Room 25	FTL	1x36W	1	36	7	25	6.30
	26	Room 26	FTL	1x36W	1	36	7	25	6.30
	27	Room 27	FTL	1x36W	1	36	7	25	6.30
	28	Room 28	FTL	1x36W	1	36	7	25	6.30
	29	Room 29	FTL	1x36W	1	36	7	25	6.30
	30	Room 30	FTL	1x36W	1	36	7	25	6.30
	31	Room 31	FTL	1x36W	1	36	7	25	6.30
	32	Room 32	FTL	1x36W	1	36	7	25	6.30
	33	Room 33	FTL	1x36W	1	36	7	25	6.30
	34	Room 34	FTL	1x36W	1	36	7	25	6.30
	35	Room 35	FTL	1x36W	1	36	7	25	6.30
	36	Room 36	FTL	1x36W	1	36	7	25	6.30
	37	Room 37	FTL	1x36W	1	36	7	25	6.30
	38	Room 38	FTL	1x36W	1	36	7	25	6.30
	39	Room 39	FTL	1x36W	1	36	7	25	6.30
	40	Room 40	FTL	1x36W	1	36	7	25	6.30
	41	Office	FTL	1x36W	1	36	7	25	6.30
	42	Guest room	FTL	1x36W	1	36	7	25	6.30
	43	Canteen	FTL	1x36W	1	36	7	25	6.30
Boy's Hostel	1	Room 1	LED	1x18W	1	18	7	25	3.15

	2	Room 2	LED	1x18W	1	18	7	25	3.15
	3	Room 3	LED	1x18W	1	18	7	25	3.15
	4	Room 4	LED	1x18W	1	18	7	25	3.15
	5	Room 5	LED	1x18W	1	18	7	25	3.15
	6	Room 6	LED	1x18W	1	18	7	25	3.15
	7	Room 7	LED	1x18W	1	18	7	25	3.15
	8	Room 8	LED	1x18W	1	18	7	25	3.15
	9	Room 9	LED	1x18W	1	18	7	25	3.15
	10	Room 10	LED	1x18W	1	18	7	25	3.15
	11	Room 11	LED	1x18W	1	18	7	25	3.15
	12	Room 12	LED	1x18W	1	18	7	25	3.15
	13	Room 13	LED	1x18W	1	18	7	25	3.15
	14	Room 14	LED	1x18W	1	18	7	25	3.15
	15	Room 15	LED	1x18W	1	18	7	25	3.15
	16	Room 16	LED	1x18W	1	18	7	25	3.15
	17	Room 17	LED	1x18W	1	18	7	25	3.15
	18	Room 18	LED	1x18W	1	18	7	25	3.15
	19	Room 19	LED	1x18W	1	18	7	25	3.15
	20	Room 20	LED	1x18W	1	18	7	25	3.15
	21	Room 21	LED	1x18W	1	18	7	25	3.15
	22	Room 22	LED	1x18W	1	18	7	25	3.15
	23	Room 23	LED	1x18W	1	18	7	25	3.15
	24	Room 24	LED	1x18W	1	18	7	25	3.15
	25	Room 25	LED	1x18W	1	18	7	25	3.15
	26	Room 26	LED	1x18W	1	18	7	25	3.15
	27	Room 27	LED	1x18W	1	18	7	25	3.15
	28	Room 28	LED	1x18W	1	18	7	25	3.15

	29	Room 29	LED	1x18W	1	18	7	25	3.15
	30	Room 30	LED	1x18W	1	18	7	25	3.15
	31	Room 31	LED	1x18W	1	18	7	25	3.15
	32	Room 32	LED	1x18W	1	18	7	25	3.15
	33	Room 33	LED	1x18W	1	18	7	25	3.15
	34	Room 34	LED	1x18W	1	18	7	25	3.15
	35	Room 35	LED	1x18W	1	18	7	25	3.15
	36	Room 36	LED	1x18W	1	18	7	25	3.15
	37	Room 37	LED	1x18W	1	18	7	25	3.15
	38	Room 38	LED	1x18W	1	18	7	25	3.15
	39	Room 39	LED	1x18W	1	18	7	25	3.15
	40	Room 40	LED	1x18W	1	18	7	25	3.15
	41	Office	LED	1x18W	1	18	7	25	3.15
	42	Guest room	LED	1x18W	1	18	7	25	3.15
	43	Canteen	LED	1x18W	1	18	7	25	3.15

ENERGY SAVING MEASURES

Building	Room	Name	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
Girl's hostel	1	Room 1	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	2	Room 2	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61

	3	Room 3	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	4	Room 4	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	5	Room 5	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	6	Room 6	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	7	Room 7	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	8	Room 8	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	9	Room 9	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	10	Room 10	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	11	Room 11	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	12	Room 12	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	13	Room 13	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	14	Room 14	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	15	Room 15	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	16	Room 16	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	17	Room 17	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	18	Room 18	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	19	Room 19	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	20	Room 20	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	21	Room 21	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	22	Room 22	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	23	Room 23	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	24	Room 24	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	25	Room 25	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	26	Room 26	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	27	Room 27	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	28	Room 28	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	29	Room 29	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61

	30	Room 30	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	31	Room 31	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	32	Room 32	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	33	Room 33	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	34	Room 34	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	35	Room 35	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	36	Room 36	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	37	Room 37	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	38	Room 38	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	39	Room 39	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	40	Room 40	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	41	Office	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	42	Guest room	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61
	43	Canteen	LED-1x18W	18	1	3.15	3.15	37.80	250	250	6.61

Total lighting savings- Hostel		
Monthly consumption	270.90	kWh/month
New monthly consumption	135.45	kWh/month
New monthly saving	135.45	kWh/month
New monthly saving	1625.4	INR/month
Total Investment	10750	INR
Payback period	**6.61**	**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 65W 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	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
Science building	Physical chemical lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	PG analytical lab-Inorganic	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	General chemical lab	3	30	5	25	11.25	18	6.75	4.50	8400	155.56
	PG organic lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	S.I. lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Research lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Analytical instrumentation lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Physics general lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Physics PG lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45

	Computer lab-1	3	65	5	25	24.38	28	10.50	13.88	8400	50.45
	Computer lab-2	3	65	5	25	24.38	28	10.50	13.88	8400	50.45
	Computer lab-3	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Physics research lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Vocational lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Botany PG lab	2	65	5	5	3.25	28	1.40	1.85	5600	252.25
	Botany general lab	3	65	5	25	24.38	28	10.50	13.88	8400	50.45
	Zoology lab-1	2	35	5	25	8.75	18	4.50	4.25	5600	109.80
	Zoology lab-2	2	35	5	25	8.75	18	4.50	4.25	5600	109.80
	Botany research lab	2	45	5	25	11.25	18	4.50	6.75	5600	69.14
	Office	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	4 Class rooms	12	35	5	25	52.50	18	27.00	25.50	33600	109.80
	12 Class rooms	24	45	5	25	135.00	18	54.00	81.00	67200	69.14
Arts, commerce building	English lab	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	English class	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	BCA lab	3	65	5	25	24.38	28	10.50	13.88	8400	50.45
	Geography lab-1	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Geography lab-2	2	65	5	25	16.25	18	4.50	11.75	5600	39.72
	20 Class rooms	40	65	5	25	325.00	28	140.00	185.00	112000	50.45
	Gymkhana	6	65	5	25	48.75	28	21.00	27.75	16800	50.45
	Sabhagruh	6	65	5	25	48.75	28	21.00	27.75	16800	50.45
	Examination section	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	Office	16	65	5	25	130.00	28	56.00	74.00	44800	50.45
	Library	13	65	5	25	105.63	28	45.50	60.13	36400	50.45
	Reading hall	7	65	5	25	56.88	28	24.50	32.38	19600	50.45

Admin building	Office	6	65	5	25	48.75	28	21.00	27.75	16800	50.45
	Principal office	2	65	5	25	16.25	28	7.00	9.25	5600	50.45
	IQC meeting	4	65	5	25	32.50	28	14.00	18.50	11200	50.45
	Vice principal office	1	65	5	25	8.13	28	3.50	4.63	2800	50.45
	APJ kalam hall	6	65	5	25	48.75	28	21.00	27.75	16800	50.45
	Language lab	5	65	5	25	40.63	28	17.50	23.13	14000	50.45
	Virtual class room	4	65	5	25	32.50	28	14.00	18.50	11200	50.45
	Girl's reading room	3	65	5	25	24.38	18	6.75	17.63	8400	39.72

Total fan savings- College building and other		
Monthly consumption	1571.38	kWh/month
New monthly consumption	673.9	kWh/month
New monthly saving	897.48	kWh/month
New monthly saving	10769.76	INR/month
Total Investment	593600	INR
Payback period	**55.12**	**months**

2. GIRL'S AND BOY'S HOSTEL

ENERGY SAVING MEASURES

Building	Room	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
Girl's hostel	1	Room 1	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	2	Room 2	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	3	Room 3	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	4	Room 4	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	5	Room 5	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	6	Room 6	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	7	Room 7	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	8	Room 8	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	9	Room 9	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	10	Room 10	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	11	Room 11	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	12	Room 12	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	13	Room 13	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	14	Room 14	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	15	Room 15	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	16	Room 16	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	17	Room 17	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	18	Room 18	1	65	7	25	11.38	28	4.90	6.48	2800	36.04

	19	Room 19	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	20	Room 20	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	21	Room 21	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	22	Room 22	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	23	Room 23	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	24	Room 24	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	25	Room 25	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	26	Room 26	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	27	Room 27	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	28	Room 28	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	29	Room 29	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	30	Room 30	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	31	Room 31	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	32	Room 32	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	33	Room 33	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	34	Room 34	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	35	Room 35	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	36	Room 36	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	37	Room 37	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	38	Room 38	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	39	Room 39	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	40	Room 40	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	41	Office	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	42	Guest room	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	43	Canteen	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
Boy's Hostel	1	Room 1	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	2	Room 2	1	65	7	25	11.38	28	4.90	6.48	2800	36.04

	3	Room 3	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	4	Room 4	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	5	Room 5	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	6	Room 6	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	7	Room 7	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	8	Room 8	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	9	Room 9	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	10	Room 10	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	11	Room 11	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	12	Room 12	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	13	Room 13	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	14	Room 14	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	15	Room 15	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	16	Room 16	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	17	Room 17	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	18	Room 18	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	19	Room 19	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	20	Room 20	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	21	Room 21	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	22	Room 22	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	23	Room 23	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	24	Room 24	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	25	Room 25	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	26	Room 26	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	27	Room 27	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	28	Room 28	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	29	Room 29	1	65	7	25	11.38	28	4.90	6.48	2800	36.04

	30	Room 30	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	31	Room 31	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	32	Room 32	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	33	Room 33	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	34	Room 34	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	35	Room 35	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	36	Room 36	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	37	Room 37	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	38	Room 38	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	39	Room 39	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	40	Room 40	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	41	Office	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	42	Guest room	1	65	7	25	11.38	28	4.90	6.48	2800	36.04
	43	Canteen	1	65	7	25	11.38	28	4.90	6.48	2800	36.04

Total fan savings- Hostel		
Monthly consumption	978.25	kWh/month
New monthly consumption	421.4	kWh/month
New monthly saving	556.85	kWh/month
New monthly saving	6682.2	INR/month
Total Investment	240800	INR
Payback period	**36.04**	**months**

ENERGY PERFORMANCE ASSESSMENT OF WATER PUMPING

OBSERVATION

1. There are three pumps operated in the college for gardening, drinking water and domestic purposes.
2. One pump is operated for daily 24 hours operation and other pump is operated daily 3 hours.

RECOMMENDATION

1. It is recommended that pump which is operated for 24 hours daily should run by automatic control panel. Operation should be one hour ON and half an hour OFF. So unnecessary consumption of water pump reduces.

SAVINGS MEASURES

Total water pump savings		
Total monthly consumption	951.6	kWh/month
New monthly consumption	634.4	kWh/month
Total saving kWh	317.20	kWh/month
Total saving	3806.40	INR/month
Total Investment	10000	INR/month
Payback period	**3**	**months**

SAVING BY MSEDCL ELECTRICITY BILL TARIFF CHANGE

OBSERVATION

1. It is observed that almost all electricity bills of the college has wrong MSEDCL tariff except for arts and commerce building electricity bills.
2. Average unit rate for existing commercial tariff is 12 INR/kWh while right tariff it is 8 INR/kWh.

RECOMMENDATION

1. It is recommended that to change existing MSEDCL Commercial tariff to Public services-others for all electricity bills.

SAVINGS MEASURES

SAVINGS DUE TO MSEDCL ELECTRICITY BILL TARIFF CHANGE

Saving due to MSEDCL electricity bill tariff change		
Existing average unit rate as per commercial tariff	12	INR/kWh
Average unit rate as per new tariff	8	INR/kWh
Average unit rate saving	4	INR/kWh
Average monthly energy consumption of college	1662	kWh/month
Savings per month	6648	INR/month
Investment	75000	INR
Payback period	**11.28**	**months**

SAVING BY ELECTRICITY DUTY EXEMPTION

OBSERVATION

3. 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	4000	INR
Investment	40000	INR
Simple payback period	**10**	**months**

SAVING BY REDUCING CONTRACT DEMAND

OBSERVATION

1. It is observed that contract demand of arts and science college electricity bill is 35 KVA.
2. But actual demand is 11 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	35	KVA
40% of contract demand	14	KVA
Actual average contract demand	11	KVA
Demand charges	373	INR/KVA
Fixed demand charges	5222	INR/month
New contract demand	22	KVA
40% new contract demand	8.8	INR/month
New demand charges	3282.4	INR/month
Saving in demand charges	1939.6	INR/month
Investment	10000	INR
Payback period	**5.16**	**months**

SAVING IN SOLAR PV SYSTEM RECTIFICATION

OBSERVATION

1. It is observed that condition of Solar PV system installed at arts and commerce building is very poor.
2. Foundation of system is collapsed due to wind.
3. DC cable string is also breaks so due to this existing solar pv system operates only at 60% of capacity than actual capacity.

RECOMMENDATION

1. It is recommended that rectify the foundation of the solar pv system as well as the break DC cable string to avoid unnecessary solar generation loss.

SAVINGS MEASURES

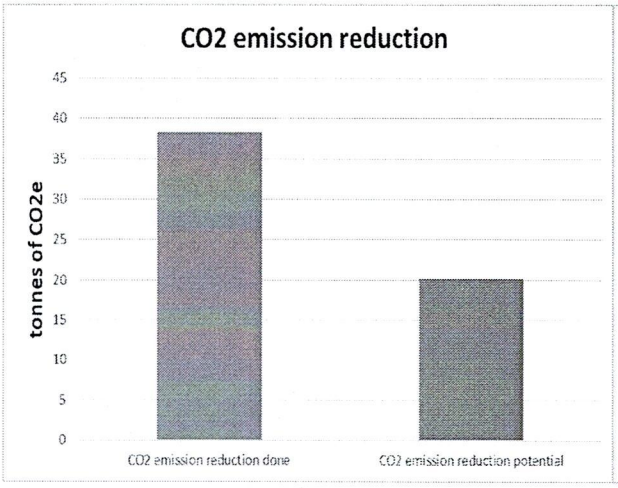
SAVINGS DUE TO SOLAR PV SYSTEM RECTIFICATION

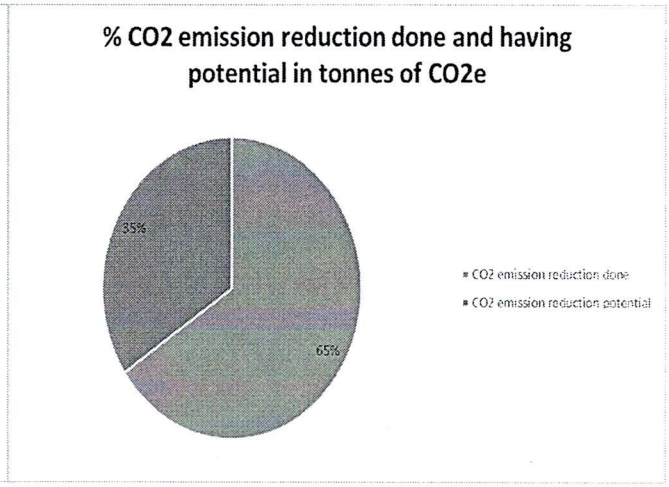
Savings due to Solar PV system rectification		
Solar PV system capacity at arts, commerce college building	21	INR/kWh
Existing energy generation at 60% capacity due losses	1260	INR/kWh
Total capacity of system	2100	INR/kWh
Loss in solar generation	840	kWh/month
Savings per month	10080	INR/month
Investment	75000	INR
Payback period	**7.44**	**months**

CO_2 EMISSION REDUCTION

CO2 emission reduction done due to new energy efficient and renewable energy		
Energy saved by new energy efficient technology	246	kWh/month
Energy saved by energy efficient technology	2952	kWh/year
Energy saved by renewable energy	3510	kWh/month
Energy saved by renewable energy	42120	kWh/year
CO2 emission reduction done	**38.31**	**tonnes of CO2e**

CO2 emission reduction potential		
Energy saving potential by energy saving/conservation	1978.18	kWh/month
Energy saving potential by energy saving/conservation	23738.16	kWh/year
CO2 emission reduction potential	20.18	tonnes of CO2e





ENERGY CONSERVATION BY SAVING OF WATER

1. TAP WATER REDUCER

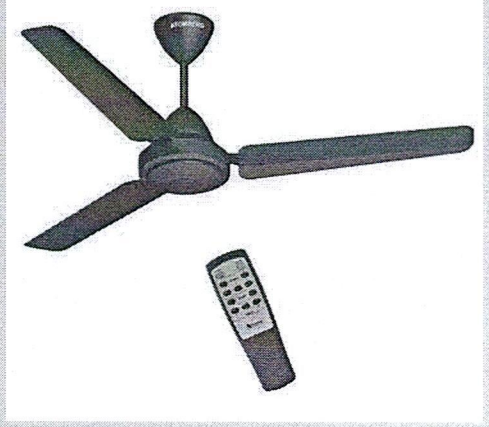
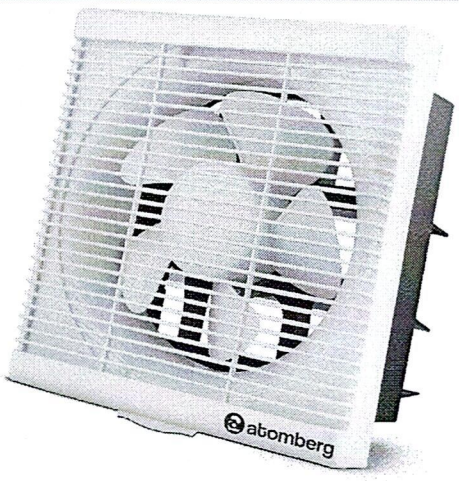
Conventional Tap water system	Tap water system with Reducer
	
Existing tap water system uses more water while during purpose of washing of utensils, hands etc in college.	Used reducer to tap water for purpose of washing of utensils, hands etc which reduces flow of water and ultimately saves the water.
⊘	√

RECOMMENDATION

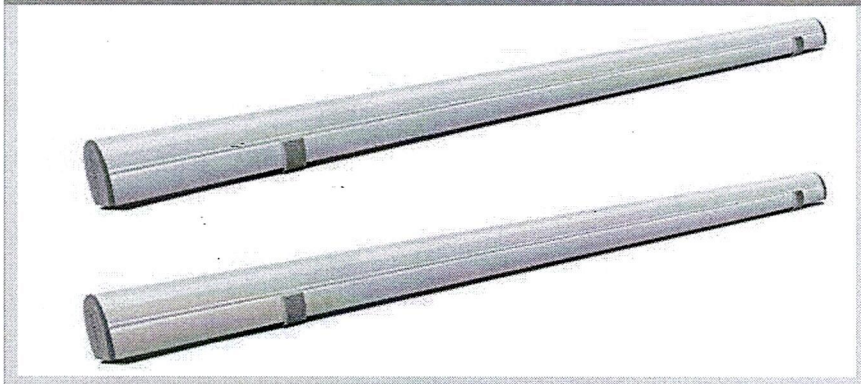
It is recommended that to use water reducer for water taping for save the water.

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