

ENERGY AUDIT REPORT

Client Name	Moreshwar Arts, Science and Commerce College Bhokardan Dist. Jalna
Project Name	Moreshwar Arts, Science and Commerce College Bhokardan Dist. Jalna
Date	Year 2022-23
Submitted by	Department of Electrical Engineering Ashokrao Mane Group of Institutions Vathar Tarf Vadgaon, Tal- Hatkanangale, Dist.-Kolhapur (Maharashtra state)

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ACKNOWLEDGEMENT

We appreciate the interest and participation of Honorable Management and Principal and Faculty in carrying out the energy audit at **Moreshwar Arts, Science and Commerce College Bhokardan Dist. Jalna**. Our special thanks to Technicians and Staff involved for college who have extended their co-operation and courtesy to the energy audit team during the audit.

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THE ENERGY AUDIT TEAM

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1. EXECUTIVE SUMMARY (Lighting Load):

Recommendations	Monthly present expenditure in Rs.	Investment for the saving of expenditure in Rs.	Savings per month in Rs.	Payback period in years.
Principal cabin Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02 no Replace 80W old fan by energy efficient fan. Quantity -01 no	270.72	4400	143.82	2.55
Office Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -04 no	812.16	15800	439.92	2.99
staff room Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -03 no	676.8	12300	363.78	2.82
Store Room Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -01 no Replace 80W old fan by energy efficient fan. Quantity -01 no	203.04	3950	109.98	2.99
Library Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -03 no	676.8	12300	363.78	2.82

<p>Student Reading Room</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -03 no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -04 no</p>	744.48	15350	406.08	3.15
<p>Exam strong Room</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -01no</p>	270.72	4400	143.82	2.55
<p>Girl common room</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -01no</p>	270.72	4400	143.82	2.55
<p>Teacher Reading Room</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -02no</p>	406.08	7900	219.96	2.99
<p>NSS Office Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -01no</p>	270.72	4400	143.82	2.55
<p>Computer Lab</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -06 no</p> <p>Replace 80W old fan by energy efficient fan. Quantity -04 no</p>	947.52	16700	507.6	2.74

<p>Class Room 1</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55
<p>Class Room 2</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55
<p>Class Room 3</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55
<p>Class Room 5</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55
<p>Class Room 6 Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55
<p>Class Room 7</p> <p>Replace 40W Copper choke tube set by 20 W LED Tube set.</p> <p>Quantity -04 no</p> <p>Replace 80W old fan by energy efficient fan.</p> <p>Quantity -02 no</p>	541.44	8800	287.64	2.55

Class Room 8 Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -02 no	541.44	8800	287.64	2.55
laboratories 1 Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -02 no	541.44	8800	287.64	2.55
laboratories 2 Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -02 no	541.44	8800	287.64	2.55
laboratories 3 Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -02 no	541.44	8800	287.64	2.55
laboratories 4 Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -04 no Replace 80W old fan by energy efficient fan. Quantity -02 no	541.44	8800	287.64	2.55
Corridor Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -10 no	676.8	4500	338.4	1.11
Gents Student Wash Room Replace 40W Copper choke	135.36	900	67.68	1.11

tube set by 20 W LED Tube set. Quantity -02 no				
Gents Staff Wash Room Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02 no	135.36	900	67.68	1.11
Ladies Student Wash Room Replace 40W Copper choke tube set by 20 W LED Tube set. Quantity -02 no Replace 80W old fan by energy efficient fan. Quantity -01 no	270.72	4400	143.82	2.55

2. SUMMARY OF SAVINGS POTENTIAL OF COLLEGE

	No. of Tube light	No. of Fan	No of AC	Projector	No of Computer	LED Bulb	T. V	Printer	Xerox machine	Gas Geyser	Electric Motor	C.C.T.V.	Inverter	Area in Sq. Ft.
Principal cabin	2	1	-	-	1	2	1	1	-	-	-	1	1	300
office	4	4	-	-	6	6	-	6	-	-	-	1	1	600
staff room	4	3	-	-	2	4	1	2	-	-	-	1	-	600
Store Room	1	1	-	-	-	1	-	-	-	-	1	1	-	300
library	4	3	-	-	4	4	-	2	1	-	-	1	1	600
Student Reading Room	3	4	-	-	1	4	-	-	-	-	-	1	-	300
Exam strong Room	2	1	-	-	2	2	-	2	1	-	-	1	1	300
Girl common room	2	1	-	-	-	-	-	-	-	-	-	1	-	300
Teacher Reading Room	2	2	-	-	1	2	-	1	-	-	-	1	1	300
NSS Office	2	1	-	-	1	2	-	1	-	-	-	1	-	300
Computer Lab	6	4	-	1	30	4	-	2	-	-	-	1	1	600
Class Room 1	4	2	-	1	-	-	-	-	-	-	-	1	-	600
Class Room 2	4	2	-	-	-	-	-	-	-	-	-	1	-	600
Class Room 3	4	2	-	-	-	-	-	-	-	-	-	1	-	600
Class Room 5	4	2	-	-	-	-	-	-	-	-	-	1	-	600
Class Room 6	4	2	-	1	-	-	-	-	-	-	-	1	-	600
Class Room 7	4	2	-	-	-	-	-	-	-	-	-	1	-	600
Class Room 8	4	2	-	-	-	-	-	-	-	-	-	1	-	600
laboratories 1	4	2	-	-	1	-	-	-	-	-	-	1	-	600
laboratories 2	4	2	-	-	1	-	-	1	-	-	-	1	-	600
laboratories 3	4	2	-	-	1	-	-	-	-	-	-	1	-	600
laboratories 4	4	2	-	-	1	-	-	1	-	-	-	1	-	600
Corridor	10	-	-	-	-	-	-	-	-	-	-	6	-	
Gents Student Wash Room	2	-	-	-	-	-	-	-	-	-	-	-	-	300
Gents Staff Wash Room	2	-	-	-	-	-	-	-	-	-	-	-	-	200
Ladies Staff Wash Room														200
Ladies Student Wash Room	2	1	-	-	-	2	-	-	-	-	-	1	1	300
Information of Solar PV plant or windmill if already fixed	4 panel solar is installed													
Details of diesel engine generator with KVA capacity	Petrol engine 3000 cps													

1) Principal Cabin

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	2	6	0.04	0.24	Nil
7	T.V	60	1	6	0.06	0.36	Nil
8	Printer	40	1	6	0.04	0.24	Nil
Total					0.55	3.3	
Total Lighting load =			0.12	Qty=	4		
Led lighting load =			0.04	Qty=	2		

2) Office

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	4	6	0.32	1.92	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	6	6	1.5	9	Nil
6	LED bulb	20	6	6	0.12	0.72	Nil

7	T.V	60	0	6	0	0	Nil
8	Printer	40	6	6	0.24	1.44	Nil
Total					2.34	14.04	
Total Lighting load =		0.28	Qty=		10		
Led lighting load =		0.12	Qty=		6		

3) Staff Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	3	6	0.24	1.44	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	2	6	0.5	3	Nil
6	LED bulb	20	4	6	0.08	0.48	Nil
7	T.V	60	1	6	0.06	0.36	Nil
8	Printer	40	2	6	0.08	0.48	Nil
Total					1.12	6.72	
Total Lighting load =		0.24	Qty=		8		
Led lighting load =		0.08	Qty=		4		

4) Store Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	1	6	0.04	0.24	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	0	6	0	0	Nil
6	LED bulb	20	1	6	0.02	0.12	Nil
7	Electric Motor	3728.5	1	4	3.7285	14.914	Nil
Total					3.8685	15.754	
Total Lighting load =			0.06	Qty=	2		
Led lighting load =			0.02	Qty=	1		

5) Library

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	3	6	0.24	1.44	Replace 80W old fan by energy efficient fan.
3	Computer system	250	4	6	1	6	Nil
4	LED bulb	20	4	6	0.08	0.48	Nil
5	T.V	60	0	6	0	0	Nil
6	Printer	40	2	4	0.08	0.32	Nil
7	Xerox Machine	1500	1	4	1.5	6	Nil

		Total	3.06	15.2	
Total Lighting load =	0.24	Qty=	8		
Led lighting load =	0.08	Qty=	4		

6) Student Reading Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	3	6	0.12	0.72	Replace 40W tube set by 20W LED tube set.
2	Fan	80	4	6	0.32	1.92	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	4	6	0.08	0.48	Nil
Total					0.77	4.62	
Total Lighting load =		0.2	Qty=		7		
Led lighting load =		0.08	Qty=		4		

7) Exam Strong Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil

4	Projector	300	0	6	0	0	Nil
5	Computer system	250	2	6	0.5	3	Nil
6	LED bulb	20	2	6	0.04	0.24	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	2	4	0.08	0.32	Nil
9	Xerox Machine	1500	1	4	1.5	6	Nil
Total					2.28	10.52	
Total Lighting load =			0.12	Qty=	4		
Led lighting load =			0.04	Qty=	2		

8) Girl Common Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
Total					0.16	0.96	
Total Lighting load =			0.08	Qty=	2		
Led lighting load =			0	Qty=	0		

9) Teacher Reading Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient

							fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	2	6	0.04	0.24	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	1	4	0.04	0.16	Nil
Total					0.57	3.34	
Total Lighting load =			0.12	Qty=	4		
Led lighting load =			0.04	Qty=	2		

10) NSS Office

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	2	6	0.04	0.24	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	1	4	0.04	0.16	Nil
Total					0.49	2.86	
Total Lighting load =			0.12	Qty=	4		
Led lighting load =			0.04	Qty=	2		

11) Computer Lab

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	6	6	0.24	1.44	Replace 40W tube set by 20W LED tube set.
2	Fan	80	4	6	0.32	1.92	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	1	6	0.3	1.8	Nil
5	Computer system	250	30	6	7.5	45	Nil
6	LED bulb	20	4	6	0.08	0.48	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	2	4	0.08	0.32	Nil
Total					8.52	50.96	
Total Lighting load =			0.32	Qty=	10		
Led lighting load =			0.08	Qty=	4		

12) Class Room 1

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	1	6	0.3	1.8	Nil
Total					0.62	3.72	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

13) Class Room 2

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

14) Class Room 3

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

15) Class Room 4

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

16) Class Room 5

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

17) Class Room 6

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	1	6	0.3	1.8	Nil
Total					0.62	3.72	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

18) Class Room 7

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

19) Class Room 8

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
Total					0.32	1.92	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

20) Laboratories 1

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
Total					0.57	3.42	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

21) Laboratories 2

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	0	6	0	0	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	1	4	0.04	0.16	Nil
Total					0.61	3.58	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

22) Laboratories 3

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Computer system	250	1	6	0.25	1.5	Nil
Total					0.57	3.42	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

23) Laboratories 4

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	2	6	0.16	0.96	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	1	6	0.25	1.5	Nil
6	LED bulb	20	0	6	0	0	Nil
7	T.V	60	0	6	0	0	Nil
8	Printer	40	1	4	0.04	0.16	Nil
Total					0.61	3.58	
Total Lighting load =			0.16	Qty=	4		
Led lighting load =			0	Qty=	0		

24) Corridor

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	10	6	0.4	2.4	Replace 40W tube set by 20W LED tube set.
2	Fan	80	0	6	0	0	Replace 80W old fan by energy efficient fan.
Total					0.4	2.4	
Total Lighting load =			0.4	Qty=	10		
Led lighting load =			0	Qty=	0		

25) Gents Student Wash Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
Total					0.08	0.48	
Total Lighting load =			0.08	Qty=	2		
Led lighting load =			0	Qty=	0		

26) Gents Staff Wash Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
Total					0.08	0.48	
Total Lighting load =			0.08	Qty=	2		
Led lighting load =			0	Qty=	0		

27) Ladies Student Wash Room

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	2	6	0.08	0.48	Replace 40W tube set by 20W LED tube set.
2	Fan	80	1	6	0.08	0.48	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil

4	Projector	300	0	6	0	0	Nil
5	Computer system	250	0	6	0	0	Nil
6	LED bulb	20	2	6	0.04	0.24	Nil
Total					0.2	1.2	
Total Lighting load =		0.12	Qty=		4		
Led lighting load =		0.04	Qty=		2		

3. SUMMARY ANALYSIS OF CURRENT SCENARIO

3.1 ANALYSIS ENERGY METER.

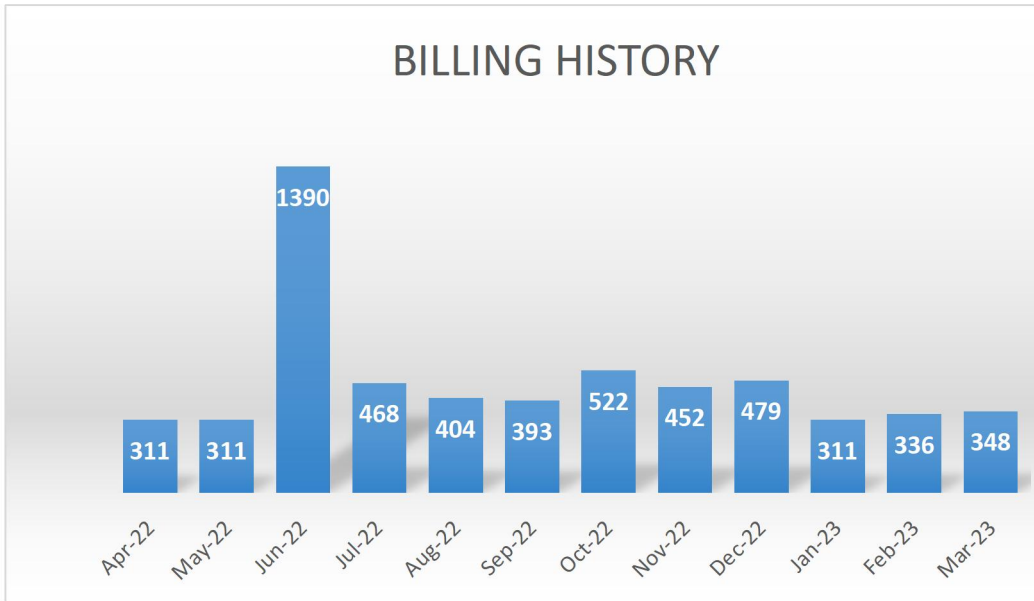
As per MSEDCL 073 /LT-X B I 0-20KW Pub Ser oth

Consumption Slab (kWh)	Fixed/ Demand Charge	Wheeling Charge (Rs/kWh)	Energy Charge (Rs. /kWh)
0-100 units	Three Phase - Rs. 384 per monthss	1.35	4.57
101 – 200 units		1.35	4.57
>200 units		1.35	4.57

Approx. Unit charges including taxes: - Rs.11.57/- Unit

Maximum Consumption in year 2022-23 = Jun-22 (1390 units)

514010427057		
Sr.No	Month	Unit Consumed in KWh
1	Mar-23	348
2	Feb-23	336
3	Jan-23	311
4	Dec-22	479
5	Nov-22	452
6	Oct-22	522
7	Sep-22	393
8	Aug-22	404
9	Jul-22	468
10	Jun-22	1390
11	May-22	311
12	Apr-22	311
	Total	5725
	Maximum	1390
	Minimum	311
	Avarage	477.08



3.2 RENEWABLE ENERGY GENERATION:

To promote green energy and energy conservation, the **Moreshwar Arts, Science and Commerce College Bhokardan Dist. Jalna.** is all set to generate 335 W electricity by installing Solar PV system on the roof of its RCC buildings.

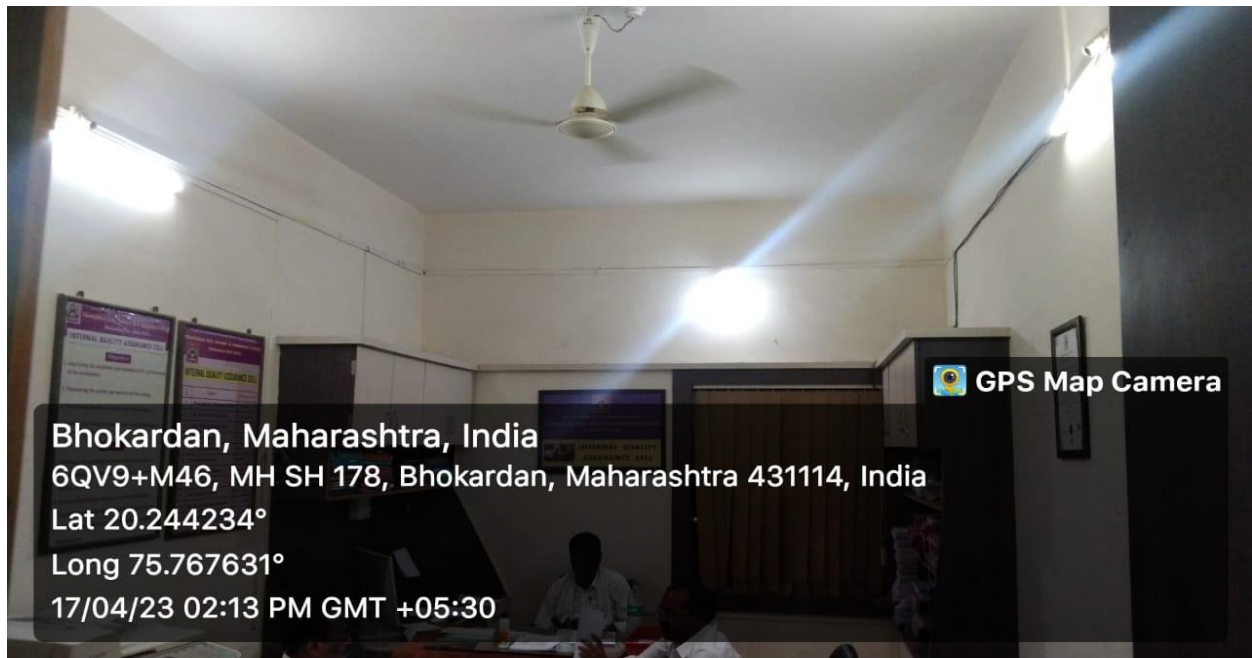


SOLAR SYSTEM PANNELS



Bhokardan, Maharashtra, India
6QV9+M46, MH SH 178, Bhokardan, Maharashtra 431114, India
Lat 20.244278°
Long 75.767646°
17/04/23 02:13 PM GMT +05:30

Inverter and battery



Bhokardan, Maharashtra, India
6QV9+M46, MH SH 178, Bhokardan, Maharashtra 431114, India
Lat 20.244234°
Long 75.767631°
17/04/23 02:13 PM GMT +05:30

Solar Load

3.3 INSTITUTE IN PROCESS TOWARDS ENERGY CONSERVATION:

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

4.0 SCOPE OF WORK:

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

5. METHODOLOGY:

5.1 MEASURED LUX LEVELS:

Sr.no.	Location/ Area/ Room	Measured Lux	Recommended Lux Level
01	Principal cabin	300	300-500
02	office	200	300
03	staff room	85	100
04	Store Room	150	300
05	library	100	300
06	Student Reading Room	95	100
07	Board Room	150	300
08	Exam strong Room	150	300
09	Girl common room	150	300
10	Teacher Reading Room	200	300
11	NSS Office	175	300
12	Computer Lab	175	300
13	Class Room 1	175	300
14	Class Room 2	170	300
15	Class Room 3	180	300-500
16	Class Room 5	200	300-500
17	Class Room 6	190	300-500
18	Class Room 7	175	300-500
19	Class Room 8	150	300-500
20	laboratories 1	165	300-500
21	laboratories 2	175	300-500
22	laboratories 3	175	300-500
23	laboratories 4	200	300-500
24	Corridor	180	300-500
25	Gents Student Wash Room	180	300-500
26	Gents Staff Wash Room	190	300-500
27	Ladies Student Wash Room	95	100

5.2 SAVING POTENTIAL CALCULATION IN EACH CLASS ROOM AND LABORATORY:

Assumptions: - Working hours of class room, laboratory and office = Approx.6hrs
Unit for institute energy bill = Approx. Rs.9.4/ kwh

Specimen calculation for Staff room :

Sr.no	Particulars	Wattage (W)	Quantity	Run Time (Hr/Day)	Load (KW)	Energy consumed per day kWh/day	Recommendation
1	Tube light (copper choke)	40	4	6	0.16	0.96	Replace 40W tube set by 20W LED tube set.
2	Fan	80	3	6	0.24	1.44	Replace 80W old fan by energy efficient fan.
3	Air Conditioner	1070	0	6	0	0	Nil
4	Projector	300	0	6	0	0	Nil
5	Computer system	250	2	6	0.5	3	Nil
6	LED bulb	20	4	6	0.08	0.48	Nil
7	T.V	60	1	6	0.06	0.36	Nil
8	Printer	40	2	6	0.08	0.48	Nil
Total					1.12	6.72	
Total Lighting load =			0.24	Qty=	8		
Led lighting load =			0.08	Qty=	4		

Specimen calculation for tube set :- Energy consumption of conventional tube light set :- 40Watt capacity tube set used for 6hrs per day so unit consumed by tube is $\frac{40\text{Watt} \times 6\text{hr}}{1000} = 0.24\text{kwh}$ per day and monthly unit consumed by tube set = 0.24×30 days = 7.2kwh / month. Energy consumption of one tube in terms of rupees = 7.2kwh x Rs.9.4 = Rs.67.68.

Specimen calculation for Fan :- A old fan capacity is 80W and used for 6 hrs. day so unit consumed by fan is $\frac{80\text{Watt} \times 6\text{hr}}{1000} = 0.48$ kwh per day and monthly unit consumed by fan = 0.48×30 days = 14.4 kwh / month. Energy consumption of fan in terms of Rs. = 14.4 kwh x Rs.9.4 = Rs.135.36.

If old fan will have replaced by new energy efficient (BEE star rating) it will consume energy Rs. 59.22 for one month.

Computer lab :- Replace 80W old fan by energy efficient fan(1no)	Cost of energy Rs.135.36	Investment for BEE star rated Fan – Rs.3500	Cost of energy Rs.59.22 Saving=Rs.135.36. -Rs. 59.22 = Rs.76.14.	Payback period 3.83 yrs.
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Tube set type	Cost Rs.	Payback	Life	Efficacy
T-8 LED tube light 1.00 inch	1600-2000	3-4 Yrs	10-15 Yrs.	@100-120 Lumens / watt
T-5 LED tube light 0.625 inch	500	6 month-1yr.	3-4 yrs.	110 lumens /watt

Evolution of BEE 5 star rated Fan

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

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

Evolution of regular rated Fan

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

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

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

To calculate your costs, use this formula:

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

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

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

6.0 CONCLUSIONS AND GENERAL RECOMMENDATION OF THE AUDIT

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

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