

# **DETAILED ENERGY AUDIT REPORT**

**Year 2023-2024**



**GOVT. SLP COLLEGE.GWALIOR**

Morar, Gwalior 474006, Madhya Pradesh India

**CONDUCTED BY:**

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<b>Project Title:</b>	<b>Detailed Energy Audit</b>
<b>Organization:</b>	<b>SEES ENERGY SOLUTION.</b>
<b>Client:</b>	<b>Shyamlal Pandviya Govt. Post Graduate College, Morar, Gwalior – 474006 Madhya Pradesh, India.</b>
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**SEES ENERGY SOLUTION, INDORE**

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**Certified Energy Auditor**



## Acknowledgement

SEES ENERGY SOLUTION Expresses sincere thanks to the management of Shyam Lal Pandaviya Govt. Post Graduate College for inviting SEES ENERGY SOLUTION Conducts comprehensive Energy Audit 2023-2024 of their Premises at Shyam Lal Pandaviya Govt. Post Graduate College. The field study of this audit was carried out on 18-Jan-2024.

The officials of Shyam Lal Pandaviya Govt. Post Graduate College have coordinated and helped to the audit team during the field study and measurement. SEES ENERGY SOLUTION Express special thanks to the following persons of Govt. Post Graduate College.

Internal Audit Team		
1	Principal	Dr. R.K.S Senger
2	IQAC& NACC Coordinator	Dr. Ajay Kumar Tripathi

We are also thankful to all other Teachers and staffs for the keen interest shown in this study and the courtesy extended. We are thankful to the management for giving us the opportunity to be involved in this very interesting and challenging project.

We would be happy to provide any further clarifications, if required, to facilitate implementation of the recommendations.

**SEES ENERGY SOLUTION, INDORE**

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**Certified Energy Auditor**



Ref.No.: SEES/EA/23-24/S/25

Dated 23/01/2024

# ENERGY AUDIT Certificate



This is to certify that **Shyam Lal Pandaviya Govt. Post Graduate College, Morar, Gwalior** has conducted Energy audit in the academic year 2023 - 2024 to assess the energy initiative planning, efforts, activities, implemented in the college campus like Light, Fan, pump, electrical load, Conservation of Energy, Energy Management and various Environmental Awareness activities. **SEES ENERGY SOLUTION** has verified campus data of **Shyam Lal Pandaviya Govt. Post Graduate College, Morar, Gwalior**. This Energy Audit is also aimed to assess impact of Energy saving initiatives for maintenance of the campus eco-friendly.

**Mr. Rambabu Raghuvanshi**

EA-29059  
Bureau of Energy efficiency  
Ministry of Power Govt. of India



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## **ABBREVIATION**

O&M	Operation and Maintenance
kW	Kilo Watt
P.F	Power Factor
kVA	kilo Volt Ampere
kWh	Kilowatt Hour
kVAh	kilovolt Amperes Hour
kVA <sub>r</sub>	Kilovolt Amperes Reactive
ACs	Air Conditioners
FTL	Fluorescent Tube Light Lamp
TR	Ton of Refrigeration
SPC	Specific Power Consumption
CMH	Cubic Meter per Hour
STL	Single Tube Light
DTL	Double Tube Light
Amp	Ampere
Volt	Voltage
BLDC	Brushless Direct Current
Nos	Numbers
Hrs	Hours
MPMKVVCL	Madhya Pradesh Madhya Khestra Vidyut Vitaran Company Ltd.



## EXECUTIVE SUMMARY

### College Details:

Particulars	Units	Details
Name of the College	-	Shyam Lal Pandaviya Govt. Post Graduate College, Morar, Gwalior – 474006 (M.P), India
Location	-	Gwalior (M.P), India
Owner	-	Government
Contact Person	-	Shri Ajay Kumar Tripathi
No. of Shifts	Nos.	1
Daily Operating Hours	Hrs./day	8
Annual Working Days	Days/yr.	300
Source of Electricity	-	MPMKVVCL
Total connected maximum Load	(kW)	60.78 kW
Total Sanctioned Load	(kW)	37.71 kW
Average Energy Charge in per unit	Rs. /kWh	<b>9.82</b>



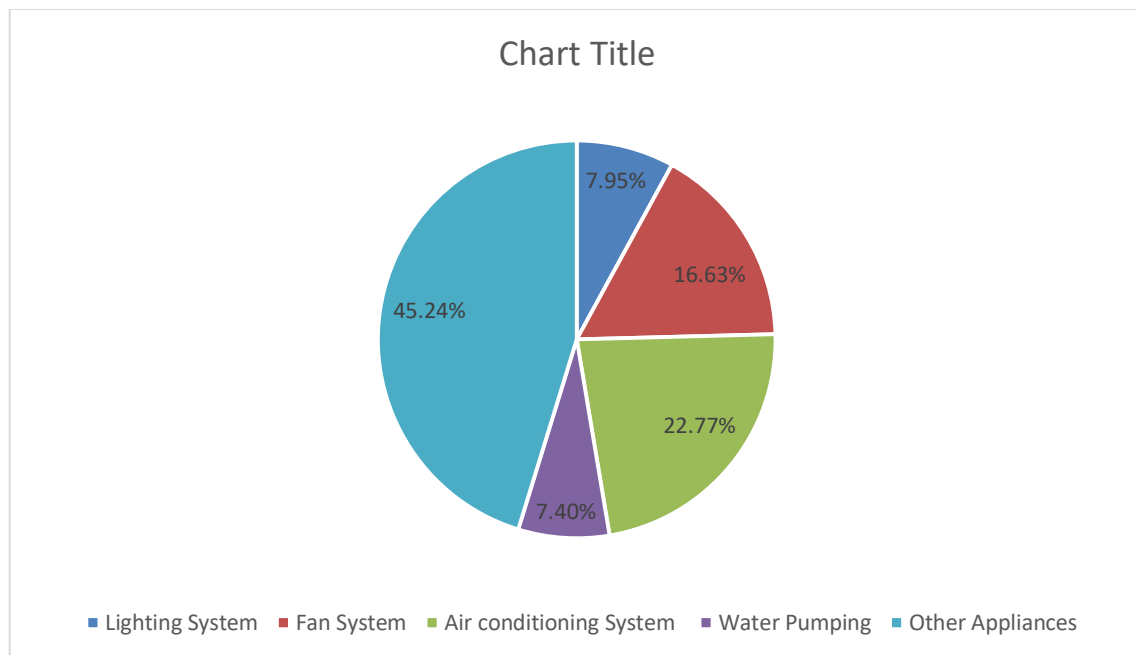


### a) Existing Major Energy Consuming Technology and Electricity billing analysis:

The major equipment's installed in **Govt. SLP College Gwalior** like Lighting fixtures, Fans and Other appliances.

**Table 1.Connected Load (kW)**

S.No.	Type of Electrical System	Connected Load Power (kW)	Connected Load (%)
1	Lighting System	4.83	7.95%
2	Fan System	10.11	16.63%
3	Air conditioning System	13.84	22.77%
4	Water Pumping	4.50	7.40%
5	Other Appliances	27.50	45.24%
<b>Total Connected Load</b>		<b>60.78</b>	<b>100%</b>



**Figure 1.Connected Load details of campus in different zone**

- As per electricity bills observation and analysis, **Total 5 major connection of total sanction load is 37.71 kW** in College premises.
- As per electricity bills observation and analysis is from **electricity unit (kWh) 51230 kWh** for electricity bill in college premise.
- As per electricity bills observation and analysis Total 12-month bill Paid is & Rs. 491351.
- As per electricity bills observation and analysis, **electricity bill Power Factor varies from 0.80-99**

**Note –Please maintain electricity bill logbook properly in record for monitoring and analysis.**



## b) Proposed Energy Saving Technologies with Cost Economics.

### + LIGHTING SYSTEM

- We appreciate to use **LED Lighting luminaries** at some location as per site visit.
- We observed during visit, few Lights were T5 tube light consuming high electricity.
- We are suggesting to purchases all electrical equipment as per star leveling program by Bureau of energy. Efficiency, and will get huge amount of electricity saving.
- We are suggesting conducting regular **Cleaning and maintenance of lighting fixtures** in every 5-6 months. To increase performance of Lighting and also improve their Lux level.
- We will get energy saving approximately **1181 kWh** per year and also will get amount saving approximately **Rs. 11666** per year by replacing conventional T5 Tube light with new energy efficient LED Tube light.
- As per data collection and site visit, Total Connected lighting load at College Campus is **4.8 kW**.
- As per data collection and observation, **Total no. of lighting fixture is 198**.

### + Ceiling Fan System

- We observed that most of the Fans installed in campus were conventional.
- We are recommended to **replace 142 no. of 70 W Ceiling fan with New Super energy efficient 5 star rated BLDC ceiling fan** and will get huge amount of electricity saving as per Star leveling program by Bureau of Energy Efficiency.
- We are **Suggesting to purchases new energy efficient BLDC fan as per Star leveling program by Bureau of Energy Efficiency, and will get huge amount of electricity saving.**
- Energy Saving calculation **and recommendation for the existing Conventional** Ceiling fans with BLDC super energy efficient fan has been given in this report.
- We are suggesting **conducting regular Cleaning and maintenance** of Fan at least in every 6 months to increase performance of Fan.
- We are also suggesting improving their Air delivery of Fan by Replacing New energy efficient BLDC Fan as per 5 stars leveling of Bureau of energy efficiency.
- We will get energy saving approximately **12326 kWh** per year and also will get amount saving approximately **Rs. 121777** per year by replacing conventional Fan with new energy efficient BLDC fan.
- The total load for Ceiling Fan is **10.11 kW**.
- Total No. of Fan fixtures are **144**.

### + Pumping System

- We observed during Energy Audit and site visit, **2 Pump of Capacity 3 HP were installed** within college campus for drinking water, Flushing and gardening purpose.
- Power consumption of each **3 HP** pump was **4.5 kW** as per site visit and measurement.
- We are suggesting purchasing **5 star rated pumps and will get huge** amount of saving as per Star leveling program by Bureau of Energy Efficiency 2020.
- We are **suggesting installing Solar Pumping system and** will get huge amount of savings.



### **+ Other Different Type of Connected Load:**

There are different types of other equipment's like Computer, Printer, Xerox machine, Water Cooler, Refrigerator and other lab equipment's are installed at various location and they also contribute electricity consumption

- We suggest to **purchase equipment's as per Star leveling program** by Bureau of Energy Efficiency 2020, and will get huge amount of electricity saving.
- Maintenance of all the equipment's should be done regularly.

### **c) Saving Highlights**

Table 2. Lighting Saving Highlights

<b>Total Amount of savings (kWh)</b>	<b>13507</b>	<b>kWh</b>
<b>Total Amount of savings Rs</b>	<b>1.33</b>	<b>Rs. In Lacs</b>
<b>Total Amount of investments</b>	<b>4.20</b>	<b>Rs. In Lacs</b>
<b>Pay Back Period</b>	<b>50</b>	<b>Months</b>

## **Summary of Energy Conservation Measures**

Table 3. Summary of Energy Conservation Measures

S. No.	Energy Conservation Measures	Annual Savings		Investment	Payback
		kWh	Rs.	Rs.	Months
<b>LED TUBE LIGHT</b>					
1	Replace 41No of Existing 30 W T5 Tube light with Energy efficient 18 W LED Tube light.	1181	11666	22550	13
<b>CEILING FAN</b>					
2	Replace 142 No of Existing 70 W Ceiling Fan with Energy efficient Energy Efficient 28 W BLDC Ceiling Fan.	12326	121777	397600	37
		13507	133443	420150	



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# CHAPTER-1

## INTRODUCTION

### 1.1 Energy Audit

Energy Audit is an effective means of establishment present efficiency levels and identifying Potential areas of improvement in energy consumption.

Energy audit of utility systems largely helps, which are given below:

- Reducing the energy consumption with resultant reduction in electricity bills.
- Audit involves data collection, data verification and detailed analysis of the data.
- The analysis lead store commendations, which are short term (with minimum investment), medium term (with moderate investment) and long term (with capital expenditure).
- The cost benefit analysis of various energy conservation proposals enables managements to take decisions regarding implementation schedules.

Energy conservation is a worldwide objective to save the human being from possible disaster. Under the mandate of The Energy Conservation Act 2001, the Bureau of energy Efficiency and Government of India are implementing various programmers to provide momentum of the energy conservation movement in the country. Energy Auditing is most vital part of the conservation of energy. In order to improve the efficiency of the Energy consuming system, energy auditing is the first necessary action to be taken by the concerned firm. Through the energy auditing actual parameters can be detected at each step, which can be compared with the standard achievable parameters. For proper Energy auditing and energy accounting, parameters need to be monitored on regular.

**Shyam Lal Pandaviya Govt. Post Graduate College** has engaged **SEES ENERGY SOLUTION**. For conducting detailed energy audit in their premises for the year of 2023-24

### 1.2 Methodology & Approach

The audit involved basic design data collection for various electrical & thermal utilities, kick of meeting with concerned part mental engineers & managers, carrying out various field measurements, performance analysis and loss analysis covering all major energy consuming sections of **Shyam Lal Pandaviya Govt. Post Graduate College**. to realistically assess losses mainly in energy consuming utility areas and potential for energy savings.

The major areas of study include:

- Building energy bills analysis.
- Electrical supply and distribution system analysis
- Lighting system analysis.
- Water pumping system analysis.
- Buildings envelop analysis.
- Specific Energy Consumption.

During study several interactions was made to the office personnel and technicians to share the actual operational features of equipment, equipment's maintenance schedule and equipment breakdown, down



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time of machineries, safety measures etc. At the same time required data was collected from the various departments and review the same with the operational actual data.

The study focused on improving energy use efficiency and identifying energy saving opportunities at various equipment's. The analyses included simple payback period and life cycle cost calculations where investments are required to be made to implement recommendations, to establish their economic viability.

### **1.3 Instrument used in Energy Audit:**

We have a wide array of latest, sophisticated, portable, diagnostic and measuring instruments to support our energy audit investigations and analyses. The audit study made use of various portable instruments along with plant online instrumentations, for carrying out various measurements and analyses. The specialized instruments that were used during the energy audit include:

- Power Analyzer.
- Ultra-Sonic Flowmeter
- Digital power clamp meter & multi-meter (4545 MECO).
- Digital Hygrometer 625 TESTO.
- Digital Lux Meter (LX-101A HTCTM).
- Digital Anemometer (AVM -07HTC).
- IR Thermometers for temperature measurement FLUKE 61 (IR -50 to 1550°C).
- Digital distance meter
- Measuring Tap meter



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## CHAPTER-2

### SITE VISIT AND INSPECTION

#### 2.1 College Details

College was started in the year 1970 in the name of Late Shri Shyamlal Pandaviya, a veteran freedom fighter and leader. It was then started from from a Govt. school building, Morar, Gwalior. Science Department was inaugurated by Late Sh. Narsingh Rao Dixit, the then Home Minister, State Govt. of Madhya Pradesh. It was shifted to a new building with vast area of more than 8 acres. All the three faculties of Arts, Science and Commerce were in the college. Earlier L.L.B Course was also run by the college, but from 1998 the posts were transferred to Govt. M.L.B. College, Gwalior. From then L.L.B. Course is not operational. It was accredited by NAAC in 2009 with A Grade and again in 2017 by B+ Grade. NAAC inspection (I Cycle) was made in October 2008 and Grade B was accorded. PGDCA course was started in 2015-16 on self-finance basis. Preparations are on for 2nd round of NAAC.

#### **VISION:**

- Shyamlal Pandviya Government P.G. College, Morar, Gwalior, seeks to be an excellent learning center of high academic standards with more and more access, equity, excellence and employability by using all high-quality modes of teaching and learning for overall development of students.

#### **MISSION:**

- To ensure Inclusion and Access of Quality education.
- To help with all possible means to underprivileged and differently able students.
- To Provide an Environment of learning that enhances dissemination of knowledge.
- To enhance the holistic approach aiming at integration of traditional knowledge with innovative and advanced practices.
- To impart Social, Environmental and Gender sensitivity in students through extension outreach.
- To help students to attain Moral, Emotional and National Integrity.

#### 2.2 Site visit and field inspection

Energy audit team visited at college campus premises and also had completed of electrical measurement and appliances data collection.



Figure 2. Class Room of the College



Figure 3. Lux Level Reading Measurement at site





## 2.3 Power Measurement

Power measurement was done in the campus by the audit team. Power is measured at the transformer section.

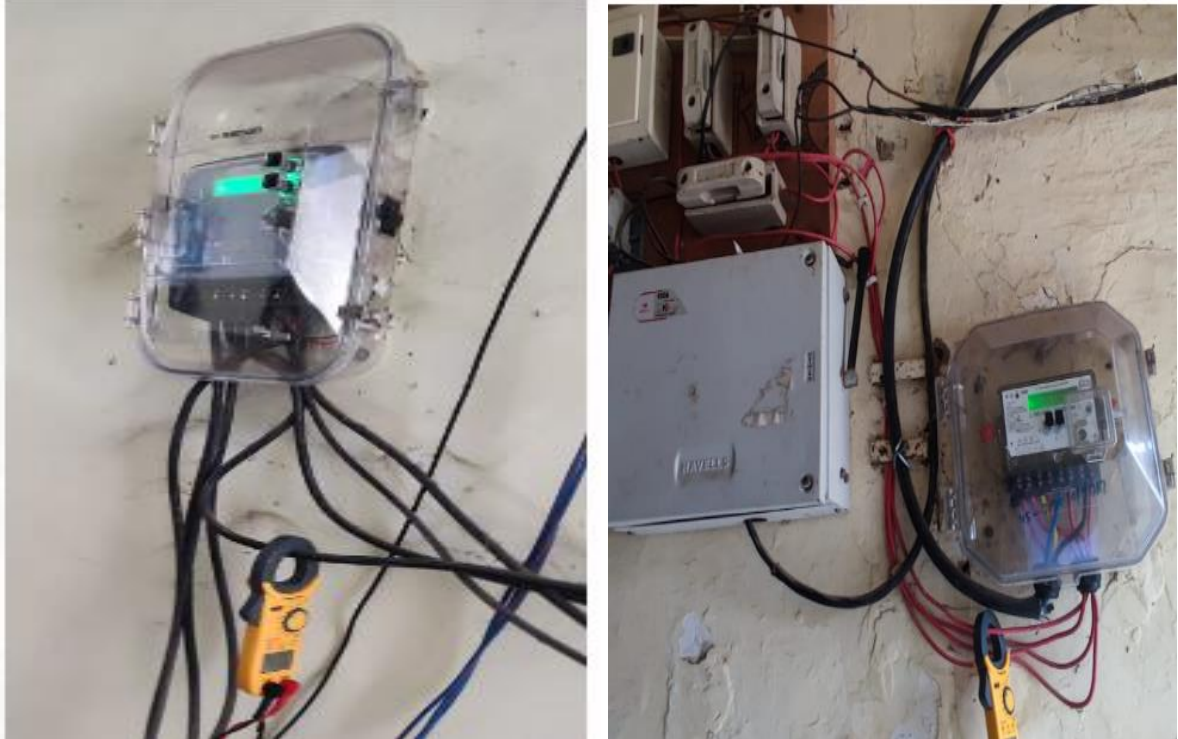


Figure 4. Main Meter at site

Power is also measured at the Panels. The figure below shows the reading on the panels which was also measured by the auditor.





## CHAPTER-3

# ELECTRICITY BILL ANALYSIS

Shyamlal Pandaviya Govt. Post Graduate College receives power from Madhya Pradesh Madhya Kshetra Vidyut Vitran Company Limited

### 3.1 Month Wise Energy Consumption

The maximum demand, energy consumption, fixed charges, energy charges and total bill in **Rs. 491351** for the academic year 2023-2024 are showing below tables as per the details from the College bill. All the one year's data has been represented by the various graphs. This indicator addresses energy consumption, energy sources, energy monitoring, and electricity consumption.

#### Tariff Schedule LV - 2

##### **NON-DOMESTIC: LV 2.1**

##### **Applicability:**

This tariff is applicable for light, fan and power to Schools / Educational Institutions including workshops and laboratories of Engineering Colleges / Polytechnics/ITIs (which are registered with /affiliated/ recognized by the relevant Govt. body or university), Hostels for students or working women or sports persons.

##### **Tariff:**

Tariff shall be as given in the following table:

Sub category	Energy Charge (paise/unit) Urban/ Rural areas	Monthly Fixed Charge (Rs.)	
		Urban areas	Rural areas
Sanctioned load-based tariff (only for connected load up to 10 kW)	630	150 per kW	120 per kW
Demand based tariff <b>Mandatory</b> for Connected load above 10 kW	630	270 per kW or 216 per kVA of billing demand	230 per kW or 184 per kVA of billing demand

Figure 5. Electricity Tariff 2022-23



Table 4. Electric Bill -1 Govt. SLP College Morar, IVRS- N2901019815

Monthly Electricity bill SLP College Gwalior city IVRS-N2901019815								
Months	Sanctioned Load (kW)	MDI	kWh	Fixed charges (Rs.)	Energy Charges (Rs.)	Power Factor	Total bill (Rs.)	Average Per unit Charges Rs./kWh
Jan-23	6.71	0	1125	1092	7312.5	0.8	9098	8.09
Feb-23	6.71	0	1131	1092	7351.5	0.8	9364	8.28
Mar-23	6.71	0	1128	1092	7332	0.8	9464	8.39
Apr-23	6.71	0	1137	1092	7390.5	0.8	9649	8.49
May-23	6.71	0	1351	1092	8781.5	0.8	10155	7.52
Jun-23	6.71	0	1210	1092	7865	0.8	9616	7.95
Jul-23	6.71	0	1233	1092	8014.5	0.8	13358	10.83
Aug-23	6.71	0	1265	1092	8222.5	0.8	13285	10.50
Sep-23	6.71	4	6306	1092	40989	0.8	47480	7.53
Oct-23	6.71	9	680	1450	4420	0.9	6423	9.45
Nov-23	6.71	3	780	1092	5070	0.9	6673	8.56
Dec-23	7	7	934	1092	6071	0.9	7680	8.22

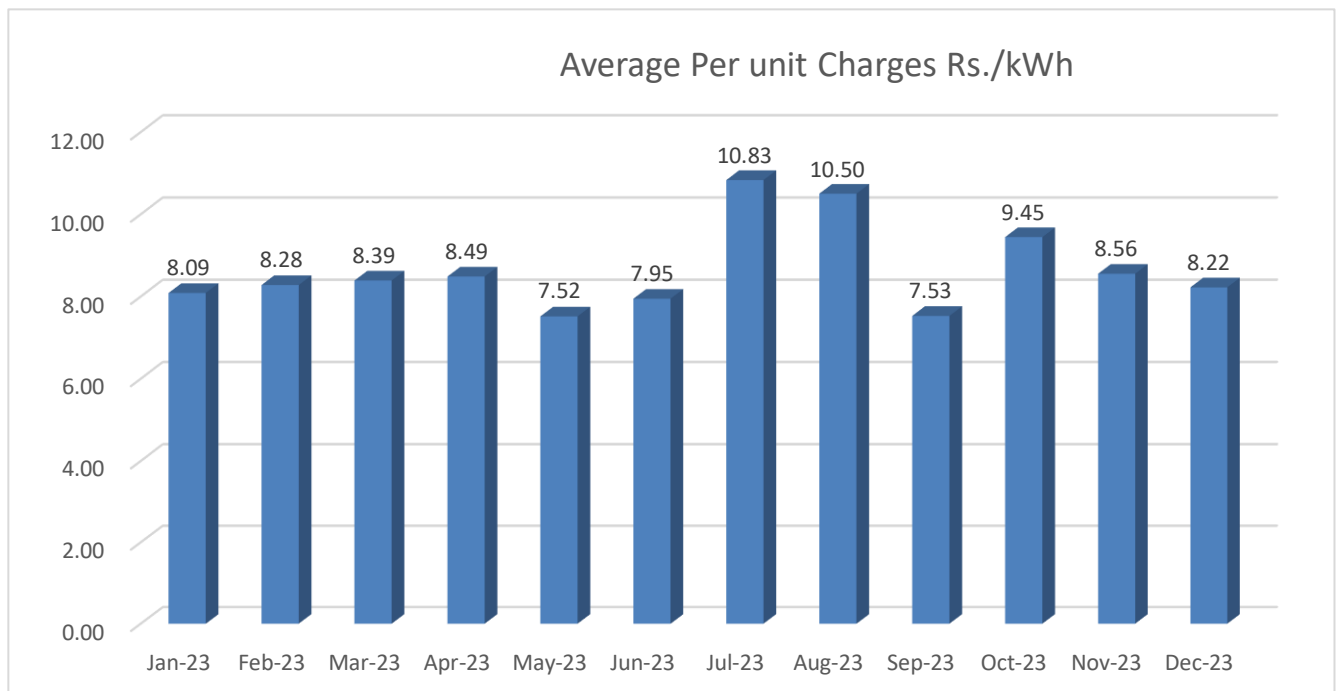


Figure 6. Per Unit Charges of IVRS- N2901019815



Table 5. Electric Bill -2 Govt. SLP College Morar, IVRS- N2901019819

Monthly Electricity bill GOVT BOYS DEGREE COLLAGE Gwalior city IVRS-N2901019819								
Months	Sanctioned Load (kW)	MDI	kWh	Fixed charges (Rs)	Energy Charges (Rs)	Power Factor	Total bill (Rs)	Average Per unit Charges Rs/kWh
Jan-23	8	3	960	1248	6240	0.9	7961	8.29
Feb-23	8	3	975	1248	6337.5	0.9	8262	8.47
Mar-23	8	2	628	1248	4082	0.9	6051	9.64
Apr-23	8	2	826	1248	5369	0.9	7457	9.03
May-23	8	5	1226	1248	7969	0.9	9280	7.57
Jun-23	8	6	1234	1248	8021	0.9	9778	7.92
Jul-23	8	9	1386	1404	9009	0.9	18176	13.11
Aug-23	8	5	1413	1248	9184	0.9	17954	12.71
Sep-23	8	6	1169	1248	7598	0.9	16483	14.10
Oct-23	8	6	946	1248	6149	0.9	7523	7.95
Nov-23	8	3	915	1248	5947	0.9	7274	7.95
Dec-23	8	4	457	1248	2970	0.9	4395	9.62

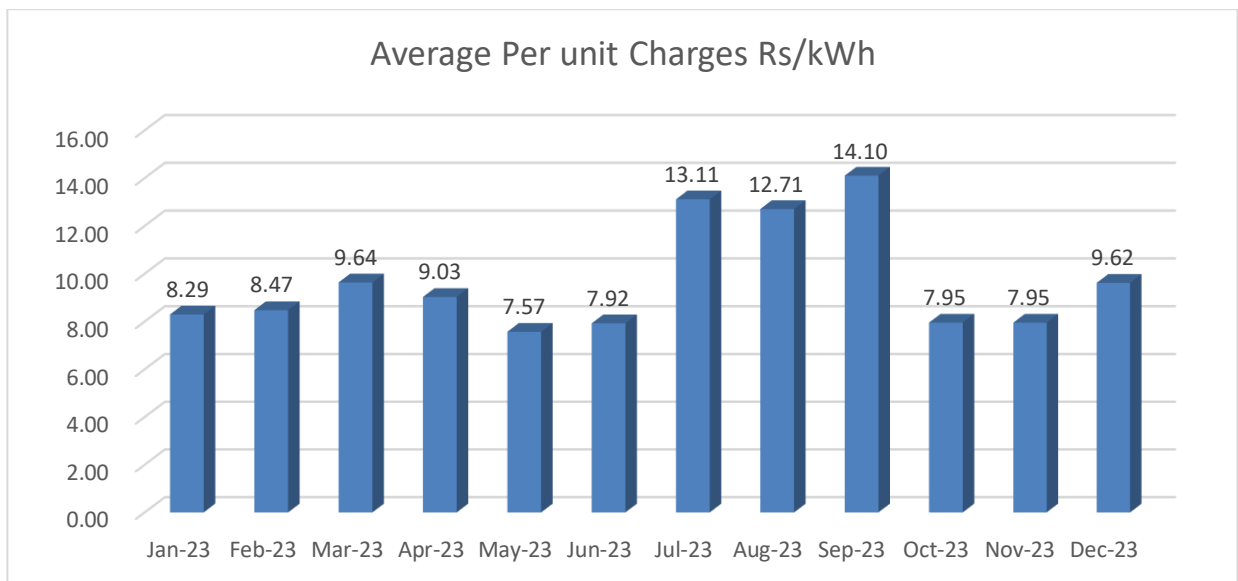


Figure 7. Per Unit Charges of IVRS - N2901019819



Table 6. Electric Bill -3 Govt. SLP College Morar, IVRS- N2901019817

Monthly Electricity bill SHYAM LAL COLLAGE Gwalior city IVRS-N2901019817								
Months	Sanctioned Load (kW)	MDI	kWh	Fixed charges (Rs)	Energy Charges (Rs)	Power Factor	Total bill (Rs)	Average Per unit Charges Rs/kWh
Jan-23	12	3.1	571	3025	3656	0.96	7165	12.55
Feb-23	12	4.8	560	3025	3640	0.98	6962	12.43
Mar-23	12	3.4	573	3025	3724.5	0.97	7170	12.51
Apr-23	12	4.4	541	3025	3516.5	0.99	6996	12.93
May-23	12	5.8	694	3025	4511	0.96	7379	10.63
Jun-23	12	9.2	1129	3025	7338.5	0.98	10327	9.15
Jul-23	12	9.3	1025	3025	6662.5	0.97	10838	10.57
Aug-23	12	8.2	1001	3025	6506	0.97	10654	10.64
Sep-23	12	9.1	1010	3025	6565	0.92	11035	10.93
Oct-23	12	4.37	1107	3025	7195	0.98	9926	8.97
Nov-23	12	3.51	851	3025	5531	0.94	8528	10.02
Dec-23	12	1.16	457	3025	2970	0.98	5773	12.63

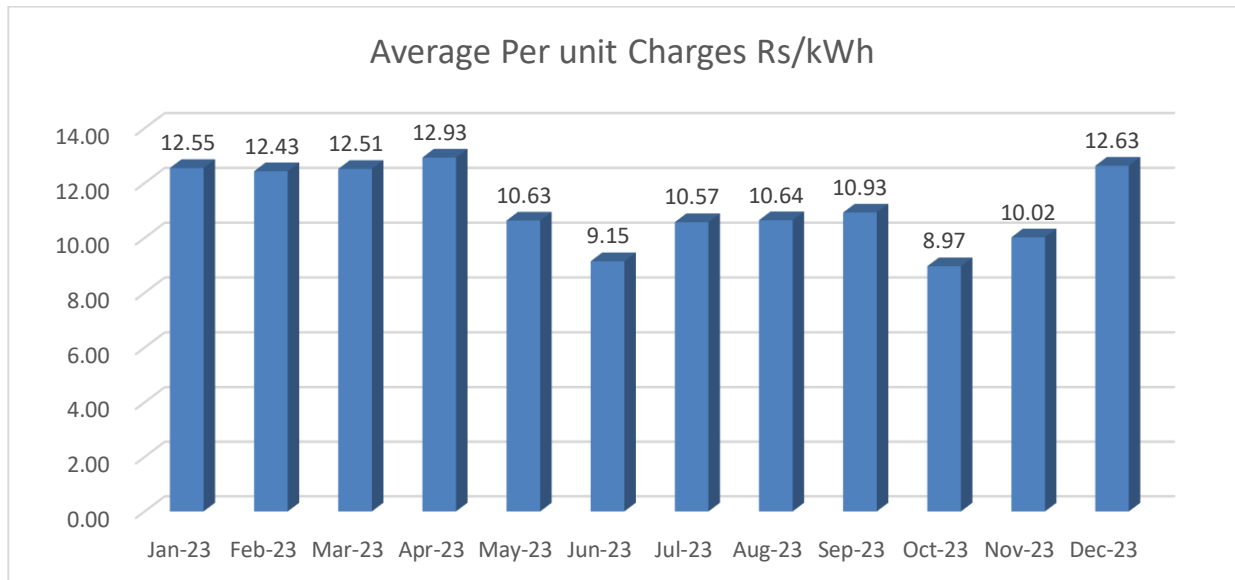


Figure 8. Per Unit Charges IVRS- N2901019817



Table 7. Electric Bill -4 Govt. SLP College Morar, IVRS- N2901019830

Monthly Electricity bill LTI BANGLOW MALL Gwalior city IVRS-N2901019830								
Months	Sanctioned Load (kW)	MDI	kWh	Fixed charges (Rs)	Energy Charges (Rs)	Power Factor	Total bill (Rs)	Average Per unit Charges Rs/kWh
Jan-23	1	0	985	156	6402.5	0.8	7129	7.24
Feb-23	1	0	983	156	6389.5	0.8	7302	7.43
Mar-23	1	0	984	156	6396	0.8	7402	7.52
Apr-23	1	0	1001	156	6506.5	0.8	7614	7.61
May-23	1	0	1232	156	8008	0.8	8421	6.84
Jun-23	1	0	1072	156	6968	0.8	7709	7.19
Jul-23	1	0	1102	156	7163	0.8	11056	10.03
Aug-23	1	0	1135	156	7377	0.8	11029	9.72
Sep-23	1	3	220	780	1430	0.8	5549	25.22
Oct-23	1	2	165	468	1072	0.9	1588	9.62
Nov-23	1	3	170	780	11105	0.9	1921	11.30
Dec-23	1	2	101	468	656	0.9	1169	11.57

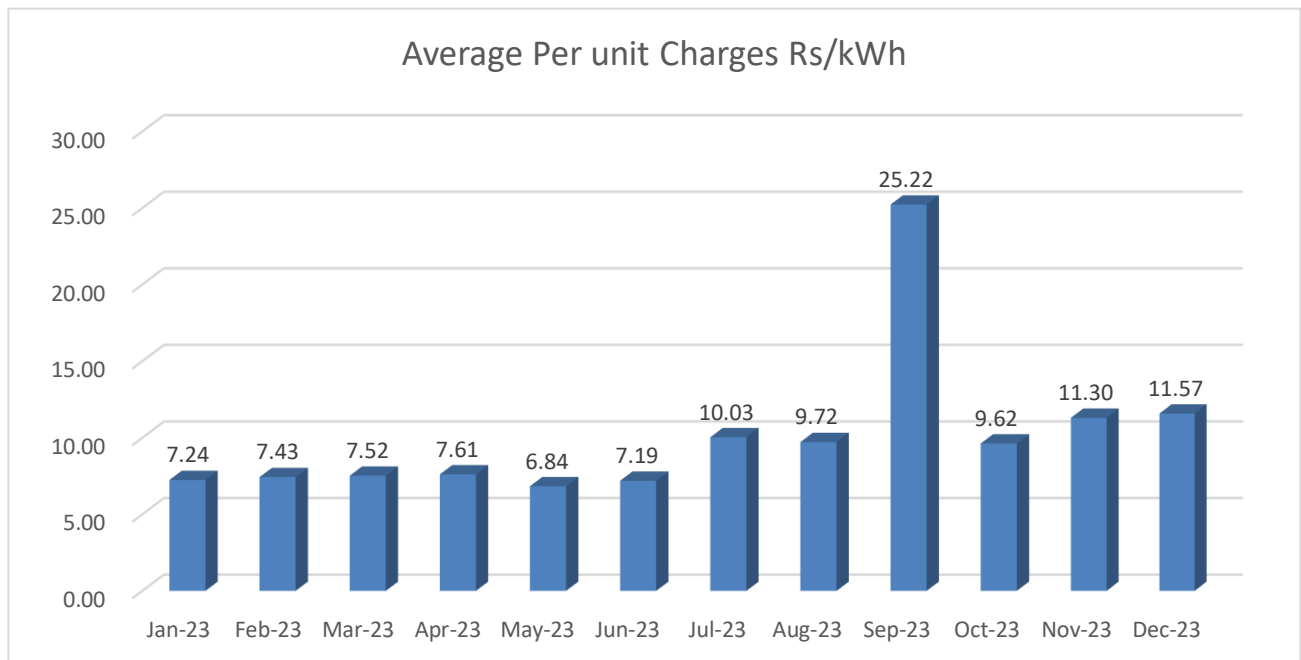


Figure 9. Per Unit of Charges IVRS- N2901019830



Table 7. Electric Bill -4 Govt. SLP College Morar, IVRS-N2901019193

Monthly Electricity bill SLP COLLAGE Gwalior city IVRS-N2901019193								
Months	Sanctioned Load (kW)	MDI	kWh	Fixed charges (Rs)	Energy Charges (Rs)	Power Factor	Total bill (Rs)	Average Per unit Charges Rs/kWh
Jan-23	10	0	0	1560	1300	0.8	2985	
Feb-23	10	0	0	1560	1300	0.8	3022	
Mar-23	10	6	0	1560	1300	0.9	3063	
Apr-23	10	2	s	1560	1300	0.9	3103	
May-23	10	6	0	1560	1300	0.9	2862	
Jun-23	10	11	386	1716	1300	0.9	3079	7.98
Jul-23	10	6	238	1560	1300	0.9	2964	12.45
Aug-23	10	6	277	1560	1300	0.9	2954	10.66
Sep-23	10	7	250	1560	1300	0.9	3003	12.01
Oct-23	10	7	340	1560	1891	0.9	3476	10.22
Nov-23	10	6	384	1560	2496	0.9	4062	10.58
Dec-23	10	6	271	1560	1761	0.9	3297	12.17

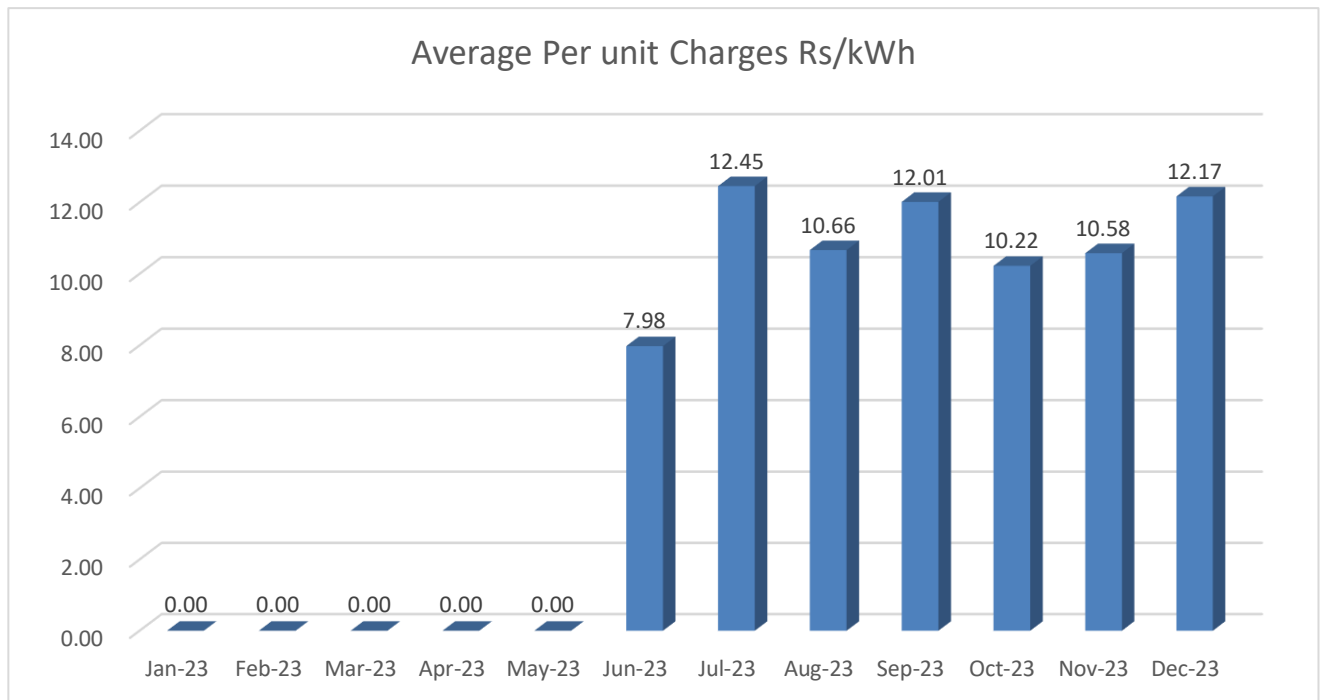


Figure 10. Per Unit of Charges of IVRS- N2901019193



### 3.2 Observations & Comments:

- As per electricity bills observation and analysis, **Total Sanction load is 37.71 kW with Nos. 5 of connection** in College premises.
- As per electricity bills observation and analysis from **electricity unit (kWh) consumed 51230 kWh for** electricity bill in college premises.
- As per electricity bills observation and analysis **Total 12-month bill Paid is Rs. 491351.00.**
- As per electricity bills observation and analysis, **electricity bill Power Factor varies from 0.80-.99**



## CHAPTER - 4

### LIGHTING SYSTEM

#### 4.1 Lighting Fixtures:

The Govt. SLP College Morar Gwalior has high lighting load and various type of indoor and outdoor lighting fixture are installed in college campus. The lux measurement was also done at the time of audit. All the parameters are given in the below table:

Table 5. Different type of lighting fixture

Govt. SLP College, Morar , Dist. Gwalior							
Sr. No .	Location	Location of Fixtures	Types of Lighting	No. of Lighti ng fixture	Power (W)	Tota l Power (W)	Lux Level
	Admin Building	Main Clerical Room	LED Bulb	2	9	18	75-90
		Main Clerical Room	Tube light T8	1	32	32	75-90
		Attached Room to Main Clerical Room	T12	1	40	40	80-120
		Attached Room to Main Clerical Room	T8	1	32	32	80-120
		Store Room	LED Bulb	1	9	9	90-140
		Store Room	Tube light T8	1	40	40	90-140
		Account Office	Tube light T8	3	32	96	180-230
		Fee Room	LED	1	20	20	70-120
		Fee Room	Tube light	1	30	30	70-120
		Scholarship Room	Tube light T12	1	40	40	130-150
		Scholarship Room	Tube light T8	2	30	60	130-150
		Principal Room	LED Tube light	1	20	20	45-105
		Principal Room	LED	7	20	140	110-300
		Principal Room	CFL	3	20	60	110-300
	Comm. Computer Lab.	Comm. Computer Lab.	LED	4	20	80	60-90
			Tube light T8	1	30	30	80-100
			Tube light T12	1	40	40	80-100
		Class Room 22	Tube light 12	1	40	40	50-90
			Incandescent Lamp	2	40	80	50-90
		Class Room 21	Incandescent Lamp	2	200	400	40-400
			LED Tube light	2	20	40	50-70
		Outdoor		4	50	200	200-250
		Math's Smart Class	Tube light T8	1	30	30	50-80
		Conference Room	Tube light T8	8	30	240	80-110
		Career Guidance Cell	LED Tube light	2	20	40	90-130





	Career guidance Cell	LED Bulb	1	9	9	90-130
Commerce Dept.	Commerce Dept.	Tube light T8	2	30	60	90-120
	Political Science	LED Tube light	1	20	20	90-110
	Political Science	LED Bulb	2	9	18	90-110
	English Dept.	LED Bulb	3	9	27	40-190
	Smart Class	LED Bulb	4	9	36	160-200
Old Building	Science Dept. Chemistry Room	LED Bulb	1	9	9	40-90
	Science Dept. Chemistry Room	Tube light T12	2	40	80	40-90
	Science Dept. Chemistry Room	LED Tube light	10	20	200	20-50
	Science Dept. Chemistry Room	LED Bulb	8	9	72	20-50
	Science Dept. Chemistry Room	Tube light T8	1	30	30	30-50
	Exam Control Room	LED Tube light	5	20	100	40-110
	Exam Control Room	Tube light T8	5	30	150	40-110
	Physics Dept.	LED Tube light	2	20	40	60-110
	Physics Dept.	Tube light T8	1	30	30	60-110
	Computer Lab.	LED Round	6	6	36	400-500
	Computer Lab.	LED Tube light	2	20	40	400-500
	Sociology	Tube light T8	1	30	30	50-80
	Zoology	Tube light T12	4	30	120	450-590
	NCC+ Dept. of Sports	Tube light T8	3	30	90	20-50
	Maths Dept.	LED Tube light	3	20	60	100-250
	Botany Dept.	Tube light T8	4	30	120	100-450
	Botany Dept.	LED Tube light	2	20	40	100-450
	New Physics Lab.	LED Tube light	18	20	360	250-300
	Corridor	LED Tube light	13	20	260	300-350
	Geography Dept.	LED Tube light	1	20	20	100-150
Geography Lab.	LED Tube light	2	20	40	80-120	
NCC	LED Tube light	2	20	40	120-160	
New Building	Class Room 1	LED Tube light	4	20	80	90-220
	Class Room 2	LED Tube light	4	20	80	90-220
	Class Room 3	LED Tube light	4	20	80	90-220
	Class Room 4	LED Tube light	4	20	80	90-220
	Library	LED Tube light	2	20	40	165-180
	E-Library	LED Tube light	1	20	20	60-130
		LED Bulb	1	9	9	65-90
	Room Book Shelf	Tube light T8	7	30	210	70-90
	Room Book Shelf	LED Tube light	2	20	40	70-90
	Corridor	LED Tube light	2	20	40	70-90
	Library Room	Tube light T12	2	40	80	20-70
	Corridor	Tube light T12	2	40	80	80-140
<b>Total Power Consumption in kW</b>		<b>4.8</b>				
<b>Total no. of Lighting Fixture</b>		<b>198</b>				



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## 4.2 Observations & Comments:

- We appreciate to use **LED Lighting luminaries** at some location as per site visit.
- We observed during visit, few Lights were FLT consuming high electricity
- We are **suggesting to purchases all electrical** equipment as per star leveling program by Bureau of energy efficiency, and will get huge amount of electricity saving.
- We are suggesting conducting regular **Cleaning and maintenance of lighting fixtures** in every 5-6 months to increase performance of Lighting and also improve their Lux level.
- We will get energy saving approximately **1181 kWh** per year and also will get amount saving approximately **Rs. 11666** per year by replacing conventional FTL/T5 Tube light with new energy efficient LED Tube light.
- As per data collection and site visit, Total Connected lighting load at College Campus is **4.8 kW**.
- As per data collection and observation, **Total no. of lighting fixture is 198**.



## LED TUBE LIGHT PROPOSAL

### Proposal 1

**Quotation for replacement of 41 Nos. existing 40 W FTL tube light with Energy efficient Energy Efficient 18 W LED Tube light in College.**

Energy Saving	
Total no of Approximate 40 W FTL	41
Replacement of 40 Watt FTL with capacity of 18 Watt LED	18
Average daily running time for 40 Watt FTL in hour	8
Total Energy Consumed by 40 W FTL	30
Total Energy Consumed by 41 no. of 28 Watt FTL kWh per day	9.8
Annual Energy Consumed by 28 Watt FTL (300 working Days) kWh	2952
Annual Energy Consumed by 41 no. of 18 Watt LED in kWh	1771
Prospective Annual Energy Savings in kWh	1181
Annual Savings in Rupees (taking Average Rs.9.88 Per unit charge for 300 day a year)	11666
Initial investment required for 41 no. of 18 Watt LED ( Price for @ 550 per 18 Watt)	22550
Payback Period in months only	23
Life of the project years	15
Depreciation Cost Rs	1503.3
ROI {(Net annual savings – Depreciation cost)/ Investment} x 100%	45



## CHAPTER-5

### FAN LOAD ANALYSIS

There is various ceiling fan installed at various location in the **Govt. SLP College, Gwalior** and they also contribute very high electricity consumption. All of the fans are conventional and hence high energy consuming.

#### 5.1 Details of Different type off Fans:

The detail of the fans is given in the below

Table6. Different type of Fan

Govt. SLP. College, Gwalior						
Sr. No.	Location	Location of Fan	Types of Fan	No. of Fan	Power (W)	Total Power (W)
	Admin Building	Main Clerical Room	Ceiling Fan	1	70	70
		Attached Room to Main Clerical Room	Stand Fan	1	50	50
		Store Room	Pedestal Fan	1	70	70
		Store Room	Exhaust Fan	1	60	60
		Account Section	Ceiling Fan	1	70	70
		Fee Room	Ceiling Fan	1	70	70
		Scholarship Room	Ceiling Fan	2	70	140
		Principal Room	Ceiling Fan	1	70	70
		Principal Room	Ceiling Fan	3	70	210
	Comm. Computer Lab.	Comm. Computer Lab.	Ceiling Fan	2	70	140
		Class Room 22	Ceiling Fan	6	70	420
		Class Room 21	Ceiling Fan	6	70	420
		Maths Smart Class	Ceiling Fan	6	70	420
		Conference Room	Ceiling Fan	12	70	840
		Career guidance Cell	Ceiling Fan	2	70	140
	Commerce Dept.	Commerce Dept.	Ceiling Fan	2	70	140
		English Dept.	Ceiling Fan	2	70	140
		Smart Class	Ceiling Fan	2	70	140
	Old Building	Science Dept. Chemistry Room	Ceiling Fan	4	85	340
		Science Dept. Chemistry Room	Ceiling Fan	2	70	140
		Science Dept. Chemistry Room	Ceiling Fan	1	70	70
		Science Dept. Chemistry Room	Ceiling Fan	2	70	140
		Computer Lab.	Ceiling Fan	4	70	280
		Sociology	Ceiling Fan	1	70	70
		Zoology	Ceiling Fan	5	70	350
		NCC+ Dept. of Sports	Ceiling Fan	1	70	70
Maths Dept.	Ceiling Fan	2	70	140		



		Botany Dept.	Ceiling Fan	5	70	350
		New Physics Lab.	Ceiling Fan	9	70	630
		New Chemistry Lab.	Ceiling Fan	9	70	630
		Geography Lab.	Ceiling Fan	3	70	210
		NCC	Ceiling Fan	2	70	140
	New Building	Class Room 1	Ceiling Fan	6	70	420
		Class Room 2	Ceiling Fan	6	70	420
		Class Room 3	Ceiling Fan	6	70	420
		Class Room 4	Ceiling Fan	6	70	420
	Library Building	Library	Ceiling Fan	1	70	70
		E-Library	Ceiling Fan	1	70	70
		Room Book Shelf	Ceiling Fan	6	70	420
		Corridor	Ceiling Fan	2	70	140
		Library Room	Ceiling Fan	6	70	420
		Corridor	Ceiling Fan	2	70	140
<b>Total Power Consumption in kW</b>				<b>10.11</b>		
<b>Total no. of Fan Fixture</b>				<b>144</b>		



## 5.2 Observations & Comments:

- We observed, most of the Fan was conventional.
- We are recommended to **replace 142 No. of 70 W Ceiling fans with New Super energy efficient 5 star rated BLDC ceiling fan** and will get huge amount of electricity saving as per Star leveling program by Bureau of Energy Efficiency.
- We are **suggesting to purchases new energy efficient BLDC fan as per Star leveling program by Bureau of Energy Efficiency, and will get** huge amount of electricity saving.
- Energy Saving calculation **and recommendation for the existing Conventional** Ceiling fans with BLDC super energy efficient fan has been given in this report.
- We are suggesting **conducting regular Cleaning and maintenance** of Fan at least in every 6 months to increase performance of Fan.
- We are also suggesting improving their Air delivery of Fan by Replacing New energy efficient BLDC Fan as per 5 stars leveling of Bureau of energy efficiency.
- We will get energy saving approximately **12326 kWh** per year and also will get amount saving approximately **Rs. 121777** per year by replacing conventional Fan with new energy efficient BLDC fan.
- The total load for Ceiling Fan is **10.11 kW**.
- Total No. of Fan fixtures are **144**.



## CEILING FAN PROPOSAL

### Proposal 1

**Replacement of 142 Nos Existing 70 W Ceiling Fan with Energy Efficient Energy Efficient 28 W BLDC Fan in College**

<b>Energy Saving</b>	
Total no of Approximate 70 W Ceiling Fan	142
Replacement of 70Watt Ceiling Fan with capacity of 28 Watt BLDC Fan	28
Average daily running time for 70 Watt Ceiling Fan in hour	8
Total Energy Consumed by 70 W Ceiling Fan	70
Total Energy Consumed by 142 no. of 70 Watt Ceiling Fan kWh per day	79.52
Annual Energy Consumed by 70 Watt Ceiling Fan (300 working Days) kWh	21868
Annual Energy Consumed by 142 no. of 28 Watt Ceiling Fan in kWh	9542
Prospective Annual Energy Savings in kWh	12326
Annual Savings in Rupees (taking Average Rs. 9.88 Per unit charge for 300 day a year)	121777
Initial investment required for 142 no. of 28 Watt Ceiling Fan( Price for BLDC Fan @ 2800 per 28 Watt BLDC Fan )	397600
Payback Period in months only	39
Life of the project years	15
Depreciation Cost Rs	26507
ROI {(Net annual savings – Depreciation cost)/ Investment} x 100%	24



## CHAPTER - 6

### OTHER EQUIPMENTS LOAD

There are different types of other equipment's like Printer, PC, Water Cooler, Refrigerator and other lab equipment's are installed at various locations in the College, Gwalior and they also contribute electricity consumption.

#### 6.1 Different Type Other Equipment's

Table 7. Different type of equipment system

Other equipment's location wise SLP Govt. P.G. College Morar, Gwalior				
Sr. No.	Type of Product	Number of Product	Power (Watts)	Total Power (Watts)
1	PC	48	100	4800
2	Printer	10	650	6500
3	TV 32" Monitor	3	41	123
4	Fridge	7	350	2450
5	Projector	4	350	1400
6	Photocopier	3	350	1050
7	Drinking water cooler	5	575	2875
8	Air Cooler Small	9	200	1800
9	Air Cooler	13	500	6500
Total				27.5

#### 6.2 Observations & Comments:

- Total Connected load **27.5 kW**.
- We suggest to **purchase Equipment's as per Star leveling program** by Bureau of Energy Efficiency 2020, and will get huge amount of electricity saving.
- Maintenance of all the equipment's should be done regularly.





## CHAPTER -7

### PUMPING SYSTEM

#### 7.1 Submersible Pumps

There is 2 no. of 3 HP capacity of submersible pump installed within college campus for drinking water, Flushing and gardening purpose.

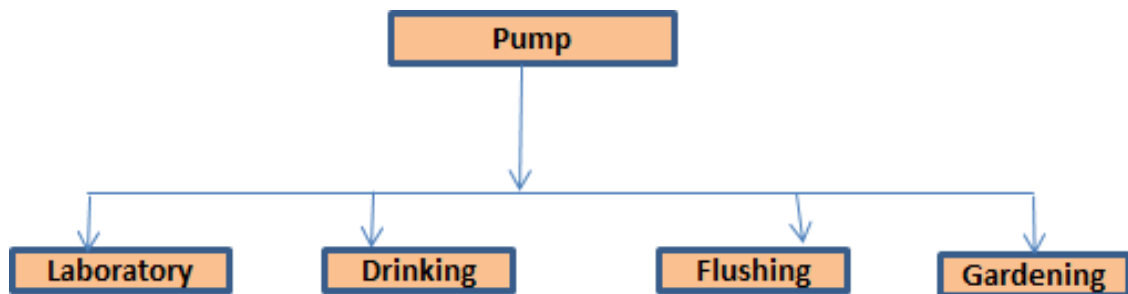


Table 8. Major usage area of pump

#### Pumps Details:

Pump Details, Govt. SLP College Morar, Chhindwara.						
Sr. No.	Location	Location of Pump	Types of Pumps	No. of Pump	Power (HP)	Total Power (kW)
1	College Campus	Back side	Submersible Pump	2	3	4.5
<b>Total Power in kW</b>						4.5

#### 7.2 Observation and Comments:

- We observed during Energy Audit and site visit **2 Pumps, of Capacity 3HP within** College campus for drinking water, Flushing and gardening purpose.
- Power consumption of 2 HP pump was **4.5 kW** as per site visit and measurement.
- We are suggesting purchasing **5 star rated pumps and will get huge** amount of saving as per Star leveling program by Bureau of Energy Efficiency2020.
- We are **suggesting installing Solar Pumping system and** will get huge amount of savings.



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## **CHAPTER-08**

# **GENERAL TIPS FOR ENERGY CONSERVATION IN DIFFERENT UTILITIES SYSTEMS**

### **Electricity:**

- Schedule your operations to maintain a high load factor
- Minimize maximum demand by tripping loads through a demand controller
- Use standby electric generation equipment for on-peak high load periods.
- Correct power factor to at least 0.99 under rated load conditions.
- Set transformer taps to optimum settings.
- Shut off unnecessary computers, printers, and copiers at night.

### **Motors:**

- Properly size to the load for optimum efficiency.
- (High efficiency motors offer of 4 - 5% higher efficiency than standard motors)
- Check alignment.
- Provide proper ventilation
- (Forevery10°C increase in motor operating temperature over recommended peak, the motor life is estimated to behaved)
- Check for under-voltage and over-voltage conditions.
- Balance the three-phase power supply.
- (An Imbalanced voltage can reduce 3 - 5% in motor input power)
- Demand efficiency restoration after motor rewinding.

### **Fans:**

- Use smooth, well-rounded air inlet cones for fan air intakes.
- Avoid poor flow distribution at the fan inlet.
- Minimize fan inlet and outlet obstructions.
- Clean screens, filters, and fan blades regularly.
- Use aero foil-shaped fan blades.
- Minimize fan speed.
- Use variable speed drives for large variable fan loads.



## **Pumps:**

- Operate pumping near best efficiency point.
- Modify pumping to minimize throttling.
- Adept to wide load variation with variable speed drives or sequenced control of smaller units.
- Stop running both pumps -- add an auto-start for an on-line spare or add a booster pump in the problem area.
- Use booster pumps for small loads requiring higher pressures.
- Increase fluid temperature differentials to reduce pumping rates.
- Repair seals and packing to minimize water waste.
- Balance the system to minimize flows and reduce pump power requirements.
- Use siphon effect to advantage: don't waste pumping head with a free-fall (gravity) return.

## **Lighting:**

- Reduce excessive illumination levels to standard levels using switching; decamping, etc. (Know the electrical effects before doing decamping.)
- Aggressively control lighting with clock timers, delay timers, photocells, and/or occupancy sensors.
- Install efficient alternatives to incandescent lighting, mercury vapor lighting, etc. Efficiency (lumens/watt) of various technologies range from best to worst approximately as follows: low pressure sodium, high-pressure sodium, metal halide, fluorescent, mercury vapor, incandescent.
- Select ballasts and lamps carefully with high power factor and long-term efficiency in mind.
- Upgrade obsolete fluorescent systems to Compact fluorescents and electronic ballasts
- Consider lowering the fixtures to enable using less of them.
- Consider day lighting, skylights, etc.
- Consider painting the walls a lighter color and using less lighting fixtures or lower wattages.
- Use task lighting and reduce background illumination.
- Re-evaluate exterior lighting strategy, type, and control. Control it aggressively.
- Change exit signs from incandescent to LED.

## **DG Sets:**

- Optimize loading
- Use waste heat to generate steam/hot water /power an absorption chiller or preheat process or utility feeds.



- ❑ Clean air filters regularly
- ❑ Insulate exhaust pipes to reduce DG set room temperatures
- ❑ Use cheaper heavy fuel oil for capacities more than 1MW

### **Buildings:**

- ❑ Seal exterior cracks/openings/gaps with caulk, gasketing, weather stripping, etc.
- ❑ Consider new thermal doors, thermal windows, roofing insulation, etc.
- ❑ Install windbreaks near exterior doors.
- ❑ Replace single-pane glass with insulating glass.
- ❑ Consider covering some window and skylight areas with insulated wall panels inside the building.
- ❑ If visibility is not required but light is required, consider replacing exterior windows with insulated glass block.
- ❑ Consider tinted glass, reflective glass, coatings, awnings, overhangs, draperies, blinds, and shades for sunlit exterior windows.
- ❑ Use landscaping to advantage.
- ❑ Add vestibules or revolving doors to primary exterior personnel doors.
- ❑ Use intermediate doors in stairways and vertical passages to minimize building stack effect.
- ❑ Use dock seals at shipping and receiving doors.
- ❑ Bring cleaning personnel in during the working day or as soon after as possible to minimize lighting and HVA Costs.

### **Waste & Waste water:**

- ❑ Recycle water, particularly for uses with less-critical quality requirements.
- ❑ Recycle water, especially if sewer costs are based on water consumption.
- ❑ Balance closed systems to minimize flows and reduce pump power requirements.
- ❑ Eliminate once-through cooling with water.
- ❑ Use the least expensive type of water that will satisfy the requirement.
- ❑ Fix water leaks.
- ❑ Test for underground water leaks. (It's easy to do over a holiday shutdown.)
- ❑ Check water overflow pipes for proper operating level.



- 
- Automate blow down to minimize etc.
  - Provide proper tools for wash down -- especially self-closing nozzles.
  - Install efficient irrigation.
  - Reduce flows at water sampling stations.
  - Eliminate continuous overflow at water tanks.
  - Promptly repair leaking toilets and faucets.
  - Use water restrictors on faucets, showers, etc.
  - Use self-closing type faucets in restrooms.
  - Use the lowest possible hot water temperature.
  - Use freeze protection valves rather than manual bleeding of lines.
  - Consider leased and mobile water treatment systems, especially for deionized water.
  - Seal sumps to prevent seepage inward from necessitating extra sump pump operation.
  - Install pretreatment to reduce TOC and BOD surcharges.
  - Verify the water meter readings. (You'd be amazed how long a meter reading can be estimated after the meter breaks or the meter pit fills with water!)
  - Verify the sewer flows if the sewer bills are based on them.

**Miscellaneous:**

- Meter any unmetered utilities. Know what normal efficient use is. Track down causes of deviations.
- Shut down spare, idling, or unneeded equipment.
- Make sure that all of the utilities to redundant areas are turned off -- including utilities like cooling water.
- Install automatic control to efficiently coordinate, chillers, cooling tower cells, etc.
- Renegotiate utilities contracts to reflect current loads and variations.
- Consider buying utilities from neighbors, particularly to hand peaks.
- Minimize use of flow bypasses and minimize bypass flowrates.
- Consider alternatives to high-pressure drops across valves.
- Turn off winter heat tracing that is on in summer.



## Annexure - 1

### Standard Lux Level

Activity	Illumination (lux, lumen/m <sup>2</sup> )
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, Homes, Theaters, Archives	150
Easy Office Work, Classes	250
Normal Office Work, PC Work, Study Library, Groceries, Show Rooms, Laboratories	500
Supermarkets, Mechanical Workshops, Office Landscapes	750
Normal Drawing Work, Detailed Mechanical Workshops, Operation Theatres	1,000
Detailed Drawing Work, Very Detailed Mechanical Works	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000



## Annexure - 2

### Energy saver for air conditioning system



PATENT  
PUBLISHED



**Airtron is the World's First & Only Programmable, Dual-Sensor Driven Microprocessor which saves up to 35% Electricity on all Air Conditioners with Precision Control of Set Temperature and a payback of barely 4-6 months.**

<b>IMPORTANT VALIDATIONS</b> N.B. The Set Temp. was the Same WITH / WITHOUT the Airtron.				
SL. NO.	NAME OF THE COMPANY	COUNTRY	AC TYPE	SAVINGS
1	ENERGY EFFICIENCY SERVICES LTD . (EESL GOVT. OF INDIA)	INDIA	SPLIT	44.00%
2	L.G. ELECTRONICS INDIA LTD.	INDIA	SPLIT (INVERTER)	26.00%
3	VIDEOCON TELECOM	INDIA	SPLIT	20.00%
4	TATA COMMUNICATION LTD.	INDIA	SPLIT	28.30%
5	LARSEN & TOUBRO LTD.	INDIA	SPLIT	25.80%
6	TATATELE SERVICES LTD.	INDIA	SPLIT	33.00%
7	TATA POWER LTD.	INDIA	SPLIT	37.50%
8	ASHOK LEYLAND LTD.	INDIA	WINDOW	29.40
9	ZENITH ENERGY (BEE, ACCREDITED ENERGY AUDITOR)	INDIA	SPLIT	37.00%
10	ACCENTURE SERVICES PVT. LTD.	INDIA	SPLIT	37.00%
11	M/S. UNIC MAGNATE	INDIA	SPLIT	58.00%
12	SATURN PYRO (UTIM REGISTRATION OFFICE)	MALAYSIA	CEILING-SPLIT	36.00%
13	SATURN PYRO (AT MALAYSIA POLICE H.Q.)	MALAYSIA	WALL -SPLIT	34.00%
14	CPE ENERGY SDN BHD	MALAYSIA	SPLIT	57.00%

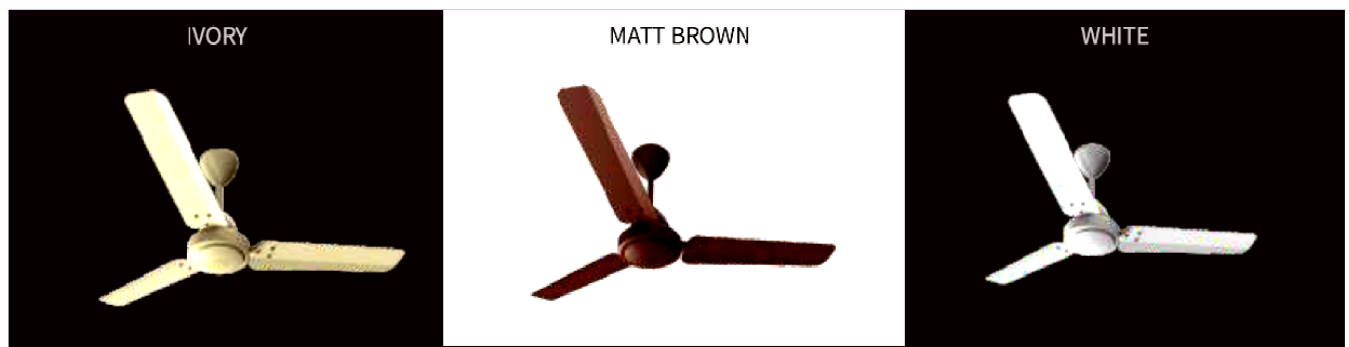




## Annexure – 3

### Super Energy Efficient BLDC Ceiling Fan

	900 mm	1050 mm	1200 mm	1400 mm
<b>Warranty (Years)</b>	3 Years	3 Years	3 Years	3 Years
<b>Blade Span (mm/inch)</b>	900/36	1050/42	1200/48	1400/56
<b>RPM</b>	450	430	350	270
<b>Service Value</b>	7.1	6.6	7.8	7.7
<b>Input Voltage (V)</b>	140-285	140-285	140-285	140-285
<b>Power Consumption (W)</b>	28	32	28	35
<b>Frequency (Hz)</b>	48-52	48-52	48-52	48-52
<b>Air Delivery (CMM)</b>	200	210	220	270
<b>Power Factor</b>	>0.98	>0.98	>0.98	>0.99
<b>No. of Blades</b>	3	3	3	3
<b>Bearing (Double)</b>	Deep Groove Double Sided Steel Shielding			
<b>Remote Control (12 Keys)</b>	Speed Control, Boost Mode, Timer and Sleep Mode			







### Comparison Between Ordinary, 5 Star Rated and Super-Efficient Fans

Parameters	Ordinary Fan	5 Star Rated Fan	Super-Efficient Fan
Wattage	75	50	28
RPM (speed)	380	<b>330</b>	360-380
CMM (air delivery)	230	<b>210</b>	220-230
Power factor	>0.9	>0.95	>0.99
Regulator	Yes	Yes	Not Required (Remote-controlled)
Input Voltage	230	230	140-285V
Warranty	1-2 year	1-2 year	3 years
MRP	1300-1600	1800-2500	3690

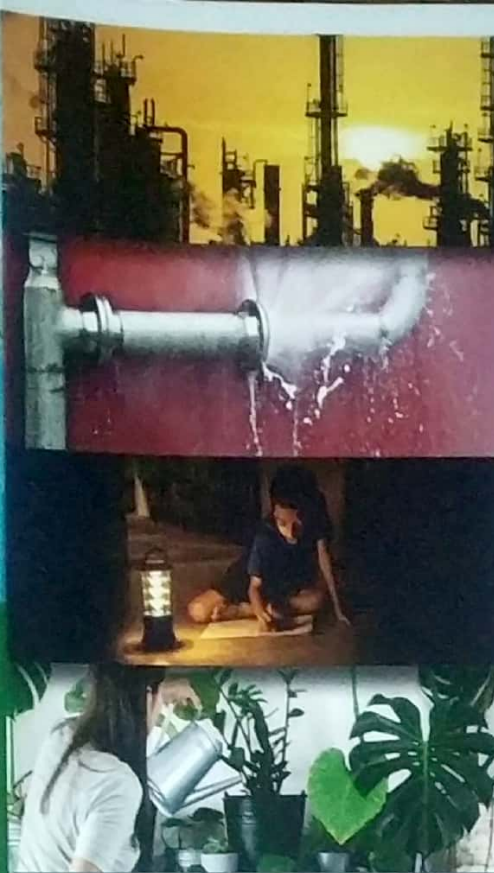


### (स) - प्रदर्शन (Demonstration)

- अन्य ऊर्जा आधारित संचयों की स्थापना का प्रदर्शन किया जायेगा ताकि जन साधारण में अन्य ऊर्जा को अगलाने के लिये व्यापक केला का इच्छा स्तर हो सके।
- वयक्ति सासकीय कर्मांतर्वे को सौर ऊर्जाकृत किये जायेगा जिले के बड़े सासकीय भवनों में "दुग्ध मिडिल" आधारित "रेसको" सॉलर प्लेट्स संचयों की स्थापना
- औणव्याडी भवनों को सौर ऊर्जाकृत किये जायेगा। औणव्याडी भवनों में "नोडिड को बैटरी" आधारित सौर संचय
- लकवोंकी शिक्षा विभाग के अग्रगत प्रदेस के 12 लकवोंकी सस्थानों को "छो-छो" किये जाकर सस्यून संच से सौर ऊर्जा द्वारा संचालित किये जा सके।
- विविध विकिसा केन्द्रों का सौर ऊर्जाकृत किये जायेगा।
- प्रदर्शन स्थलों की Success Stories को विभिन्न माध्यमों से प्रचारित किये जायेगा।

### (3)- म.प्र. ऊर्जा साक्षरता अभियान से कैसे जुड़े

- इस अभियान में जुड़ना पूर्णतः निशुल्क है।
- वेबपोर्टल या मोबाईल एप के माध्यम से (एप डाउनलोड करें)।
- मोबाईल ओटीपी के माध्यम से पंजीकरण।
- पंजीकरण उपरंत अपनी स्वेच्छा अनुसार निम्न पाठ्यक्रमों में से एक का चयन कर सकेंगे।
- पाठ्यक्रम के चयन पर प्रतिभागियों को पाठ्यक्रम (Module) डाउनलोड करने की सुविधा।
- प्रतिभागी अपनी सुविधा अनुसार, ऑनलाईन पद्धति से बहु विकल्पिय प्रश्नों के रूप में एक परीक्षा में भाग ले सकेंगे।
- प्रश्न कन्स्यूटर द्वारा रेण्डम आधार पर प्रस्तुत होंगे। प्रतिभागियों के उत्तरों के आधार पर ऑनलाईन ऊर्जा साक्षरता प्रमाण-पत्र जारी किया जाएगा जो कि ओटीपी वेरीफिकेशन से डाउनलोड किया जा सकेगा।
- प्रतिभागियों को श्रेणी सुधार एवं अन्य उच्च स्तर पर परीक्षा में सम्मिलित होने की सुविधा भी उपलब्ध होगी।



अभियान से जुड़ने के लिए लॉगिन करें  
[www.usha.mp.gov.in](http://www.usha.mp.gov.in)



M.P. New & Renewable Energy Dept (Govt of MP), Bhopal



मध्य प्रदेश ऊर्जा विकास निगम लिमिटेड,  
"ऊर्जा भवन" मेन रोड नं. 2, शिवाजी नगर, भोपाल - 462016 (म.प्र.)  
[www.mprenewable.nic.in](http://www.mprenewable.nic.in) | email: [ceuvn@mp.gov.in](mailto:ceuvn@mp.gov.in)

नरेन्द्र मोदी  
 प्रधानमंत्री

निरवयुज सिंह खोसला  
 मुख्यमंत्री

**ऊर्जा साक्षरता**

हरदीप सिंह कोहली  
 मंत्री, नवीन एवं नवनिर्माण ऊर्जा

प्रकाश चंद्र मिश्रा  
 मंत्री, पंच. ऊर्जा विकास प्रदेस वि.

## ऊर्जा साक्षरता अभियान (Urja Saksharta Abhiyan (Usha))







# ऊर्जा साक्षरता अभियान

# (UshA)



## (1) - पृष्ठभूमि

वर्तमान परिदृश्य में अल्पवयु परिवर्तन के पर्यावरणोप दुष्प्रभाव वैश्विक स्तर पर फैल चुके हैं। नवीकरणीय और अल्पवयु परिवर्तन के प्रभावों से निवारण की दिशा में कदम बढ़ाते हुए भारत सरकार द्वारा "ऊर्जा साक्षरता अभियान" प्रारम्भ किया जा रहा है-

- विश्व में इस उद्योग अभियान के माध्यम से स्कूलों, कॉलेजों के विद्यार्थियों एवं आम जनता को ऊर्जा, ठोस ऊर्जा और ऊर्जा की बचत के विषय में जागरूकता दी जायेगी।
- अल्पवयु परिवर्तन को ऊर्जा के उपयोग के प्रत्यक्ष एवं अप्रत्यक्ष रूपों की जानकारी सुलभ रूप में पहुँचाने एवं अवसरों का कार्य एक विशाल के रूप में विकसित करना।



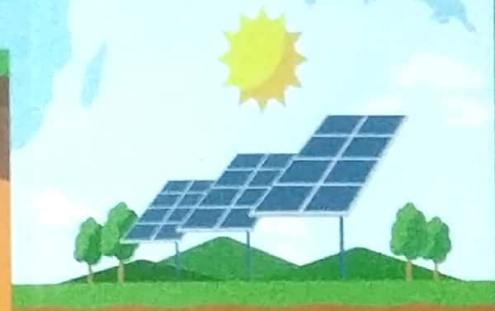
## (2) - अभियान के उद्देश्य

इस ऊर्जा साक्षरता अभियान के मुख्य उद्देश्य इस प्रकार हैं-

- कार्यवाही रूप से प्रदेश की जनता को ऊर्जा साक्षरता अभियान के अंगीकार ऊर्जा साक्षर बनाने का महाअभियान।
- ऊर्जा के व्यव एवं उपयोग को समझा जा सके।
- ऊर्जा के परम्परागत एवं वैकल्पिक स्रोतों की जानकारी एवं इनका पर्यावरण पर प्रभाव की समझ पैदा करना।
- ऊर्जा एवं ऊर्जा के उपयोग के बारे में सचेत संवाद हो सके।
- ऊर्जा संरक्षण एवं प्रबंधन के बारे में जागरूक करना।
- ऊर्जा उपयोग के प्रभावों, परिणामों की समझ के आधार पर इसके एक उपयोग हेतु निर्णय लेने में।
- पर्यावरणोप तंत्रिका एवं अल्पवयु परिवर्तन के कारगर प्रभाव को कम करना।

### ऊर्जा साक्षरता अभियान - विद्यार्थियों पर (AIG) -

ऊर्जा साक्षरता अभियान को ज्ञान, जागरूकता (awareness), जानकारी (information) एवं प्रदर्शन (demonstration) चारों के माध्यम से विकसित किया जा रहा है (AIG)



## (अ) - अभियान के जागरूकता (Awareness) -

(Awareness) घटक के तहत जन साधारण हेतु निम्न प्रकार सामग्री के माध्यम से जागरूक करना -













- पोस्टर
- होर्डिंग
- एनीमेशन वीडियो
- सोशल मीडिया
- एफ.एस. रेडियो
- डिग्लस
- वाॉल पैन्टिंग
- अन्य

## (ब) - जानकारी (Information)

अभियान को संचार के प्रभावी तरीके "वेब पोर्टल" व मोबाईल एप आधारित ऑनलाईन प्रशिक्षण पद्धति से क्रियान्वित करना।

- पाठ्यक्रम मॉड्यूल की प्रस्तावित श्रेणियाँ - लेवल I से IV तक एवं मास्टर ट्रेनर एवं वॉलन्टियर्स के लिए।
- स्कूलों में ऊर्जा साक्षरता बाबत "स्वयं करके देखो" (Do it yourself) जैसे प्रयोग।
- "ऊर्जा साक्षरता अभियान" योजना में सभी की भागीदारी सुनिश्चित करने हेतु वेबपोर्टल आधारित प्रशिक्षण कार्यक्रम से प्रजागीकरण हेतु प्रेरित करना।
  - ✓ मासिक द्वारा स्वयं का प्रजागीकरण करना।
  - ✓ परिवार के सदस्यों का प्रजागीकरण करना।
  - ✓ पास-पड़ोस के लोगों को प्रजागीकरण हेतु प्रोत्साहित करना।
  - ✓ मोहल्ले / कॉलोनी के लोगों को प्रजागीकरण हेतु प्रोत्साहित करना।
- अभियान को विस्तार देने के लिए स्कूलों, विद्यालयों, विश्वविद्यालय स्तर पर छात्रों को Brand Ambassador बनाया जाएगा।
- किसान/गृहणी/व्यवसायिक/छात्र-छात्रा/नौकरी पेशा/सभी वर्ग के लोगों को उत्कृष्ट सहभागिता होने पर पुरस्कृत किया जाना प्रस्तावित है।
  - ✓ समाज के समस्त वर्गों को अभियान से जोड़ने के विशेष रूप से कार्यक्रमों का रूपान्तरण किया जाएगा।



	इलेक्ट्रिक क्षेत्र का उपयोग करें		दोस्तों व परिवार के सदस्यों के साथ यथासंभव करपूलींग करें
	सबसे निचले से शुरू करें। नियत व बदलते समय अपने घर को क्लेस से दूर रखें		सॉलर वाटर हीटर का उपयोग करें
	टेलीविजन के स्थान पर बाह्य खुले वातावरण में रहें		बायोगैस का उपयोग खाना बनाने व बिजली उत्पादन के लिए करें
	एक कंटीनर का उपयोग 24 डिग्री वा असेस अधिक रखें		प्रशर कूकर का अधिकाधिक उपयोग करें
	इलेक्ट्रॉनिक संदेशों को सूची में से हटा दें		स्मार्ट स्वीचेस का इस्तेमाल करें
	खाने वाली हलु मछली का उपयोग करें		फ्रिज को समय-समय पर डिफ्रॉस्ट करते रहें

**ऊर्जा साक्षरता - ऊर्जा संरक्षण - संतुलित पर्यावरण**  
**एक परिवार एक यूनिट**  
**प्रतिदिन बिजली की बचत करें**

मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड  
 नवीन एवं नवकरणीय ऊर्जा विभाग  
 भोपाल



**Mission LiFE-Lifestyle for Environment**

मिशन लाइफ का मुख्य उद्देश्य संसाधनों के विनाशकारी उपभोग के बजाय सचेत उपयोग को बढ़ावा देना है

श्री नरेन्द्र मोदी  
 माननीय प्रधानमंत्री

“हार्ट ऑफ इंडिया”, मध्यप्रदेश को “लंग ऑफ इंडिया” बनाना है। मध्यप्रदेश में ऊर्जा साक्षरता अभियान के माध्यम से ऊर्जा संरक्षण एवं प्रबंधन को अपने जीवन में अपनाने हेतु प्रेरित/प्रोत्साहित किया जा रहा है।

श्री शिवराज सिंह चौहान  
 माननीय मुख्यमंत्री

जलवायु परिवर्तन के नकारात्मक प्रभावों को कम करने के लिए सामाजिक बिहेवियर में परिवर्तन की आवश्यकता को देखते हुए मा. प्रधानमंत्री महोदय ने COP-26 में Lifestyle for Environment (LiFE) को अपनाने का आह्वान किया है। (Behaviour change can help up in climate change) मिशन LiFE पर्यावरण आरे जलवायु के लिए सामुहिक कार्यवाही की दिशा में व्यक्तियों के प्रयासों को जोड़ता है।

मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड  
 नवीन एवं नवकरणीय ऊर्जा विभाग  
 भोपाल





मिशन LIFE के तीन चरण है -

- i. मांग में बदलाव (Change in Demand):- आम जन को अपने दैनिक जीवन में सरल लेकिन प्रभावी पर्यावरण अनुकूल बदलाव करने हेतु प्रेरित करना।
- ii. आपूर्ति में बदलाव (Change in Supply):- बड़े पैमाने पर व्यक्तिगत मांग में बदलाव के आधार पर उद्योगों एवं बाजारों की मांग एवं आपूर्ति के पैटर्न में बदलाव।
- iii. नीतिगत बदलाव (Change in Policy):- मिशन LIFE की दीर्घकालिक दृष्टि बड़े पैमाने पर औद्योगिक और सरकारी नितियों में बदलाव को गति प्रदान करना है, जो स्थायी खपत और पर्यावरण अनुकूल उत्पादन का समर्थन कर सके।

मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड  
नवीन एवं नवकरणीय ऊर्जा विभाग  
भोपाल



सौर संपर्क को उपयोग में ऊर्जा की आवश्यकता को पूर्ण के साथ ही वैश्वीय उत्सर्जन भी सीमित किया जा सकता है।

मिशन लाइफ के मुख्य बिन्दु

- > ऊर्जा की बचत
- > पानी की बचत
- > एकल उपयोग प्लास्टिक को ना करें
- > टिकाऊ/सतत खाद्य प्रणालियों को अपनाना
- > ठोस अपशिष्ट को कम करना
- > ई-वेस्ट को कम करना
- > स्वस्थ जीवन शैली को अपनाना

	एल.ई.डी बल्ब एवं एल्यूमीनियम का उपयोग करें		सार्वजनिक परिवहन का अधिकाधिक उपयोग करें
	सम्भवतः लिफ्ट के स्थान पर सीढ़ियों का इस्तेमाल करें		ताल बली होने पर साहन का इग्नीशन बन्द करें
	कम दूरी के लिए पैदल जाएं या साइकल का उपयोग करें		उपयोग न होने पर लिजली के उपकरणों जैसे-सिंचाई पम्प आदि को बंद करें

मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड  
नवीन एवं नवकरणीय ऊर्जा विभाग  
भोपाल