

# ENERGY AUDIT CERTIFICATE

This is to certify that Energy Audit has been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and an ISO 14001:2015 company and suggestions for improvements have been given. The Audit activity has been executed for beneficiary with following Details:-

Uran Education Society's College of Management & Technology  
Palak Maidan, Bori, Uran Maharashtra


Date of Audit: 20/05/2023

Assessment Period: 2021-2023 Valid till: 19/05/2024



  
ANUP A. SAMANT  
TECHNICAL DIRECTOR



  
ASHUTOSH V. THAKUR  
MANAGING DIRECTOR

Saur Engineers & Consultants Pvt. Ltd.

Registration No: EA-28 MEDA/ECN/2023-24/Class-A/EA 28

Empanelled Energy Auditor-CLASS A, MEDA, Government of Maharashtra

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.



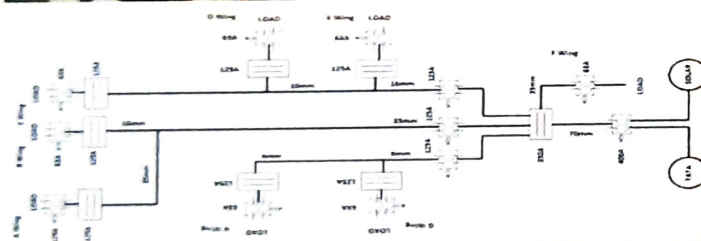
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- Liasoning
- Energy Audit
- Safety Audit
- Electrical Projects
- Solar Projects

UES's College of Management & Technology  
Palak Maidan, Bori, Uran Maharashtra



Report By  
M/S. Saur Engineers & Consultants Pvt. Ltd.  
Mumbai.

- Registered Energy Auditor
- Power Consultant
- Channel Partner-MNRE, Govt. of India.
- Channel Partner-MEDA, Govt. of Maharashtra.
- Solar Grid Engineers, NISE, Govt. of India
- Licensed Electrical Contractor,

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Solar Rooftop EPC | New Electric Connections| Meters (New, Shifting, additional)  
Load Management | Electrical Installation & Maintenance| Permissions, approvals, liasoning  
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**Detailed Report**  
**Energy Audit**

=====  
**Project Beneficiary**  
**2021-2023**

=====  
**Uran Education Society's**  
**College of Management & Technology**

=====  
Palak Maidan, Bori  
Uran Maharashtra

=====  
**Consultants & Auditor**

=====  
**SAUR**  
**Engineers & Consultants**  
**Pvt. Ltd.**

REGISTRATION NO. : EA-28

=====  
D-8, Plot No. 108, Akshay, Rsc-16,  
Gorai-1, Borivali (west), Mumbai-400092  
MAHARASHTRA  
+919867499812/+919168402909



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### **INDEX**

<b>No.</b>	<b>Topic</b>	<b>Page No.</b>
A	Acknowledgement	04
B	Certificate	05
1	Introduction	06 – 07
2	Topography	08 – 11
3	Electric System	12
4	Billing Analysis	13 – 14
5	Connected Load Analysis	15 – 16
6	Consumption Analysis	17
7	Lighting System Analysis	17
8	Cooling System Analysis	17
9	Renewable System Analysis	17
10	Conservation Analysis	18
11	Suggestions	19
12	Disclaimer	19
13	Conclusion	19

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### **Acknowledgement**

This is to certify that Detailed Energy Audit has been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and an ISO 14001:2015 company.

This activity is jointly executed by auditor and beneficiary to account energy use and conservation opportunity without sacrificing its purpose. The main object was to assess the existing system for Energy saving opportunities, High quality professional and sustainable power quality management, Adopt best practices and Standard operating procedures.

Beneficiary premise is a leading educational service utility in semi-urban area. The college is run as per the norms and standards and having awareness and approach towards energy saving. The management and staff are keen on saving energy on every opportunity available.

We sincerely acknowledge efforts of Management and staff members for smooth execution of audit process. We sincerely acknowledge the leaders and guides of the activity who helped to design and supported to the execution of the process

Mrs. Sonali Mhatre, Principal and Team Head  
Dr. Minakshi Gupta, Team Member, Teaching  
Ms. Manali Haldankar, Team Member, Teaching  
Ms. Neha Varma, Team Member, Non-Teaching  
Mr. Sairam Pradhan, Team Member, Student  
Mr. Anil Mhatre, Team Member, Electrician  
Mr. Ajay Kumar Yadav, Team Member, Helper  
Mr. Kishor Shama, Team Member, External expert  
and all other technical, teaching, non-technical staff and students of college.

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**Name of Beneficiary:** Uran Education Society's College of Management & Technology

**Registration Number:** F-173 COLABA

**Address:** Palak Maidan, Bori, Uran Maharashtra

**Contact Person:** Dr. Minakshi Gupta

**Contact Number:** 8108214659

**Date of Audit:** 20/05/2023

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Mumbai - 400 091.

### Sign & Seal

Saur Engineers & Consultants Pvt. Ltd.

Registration No: EA-28

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### **1. Introduction**

Energy Audit is a Basic essential activity to be done for saving in electrical billing and also allied with any energy saving projects like renewable energy project and solar projects. Energy Audit is an assessment of usage, consumption and pattern of energy used in the premises based on all above parameters along with conditions and benchmarks as resource and Building Envelope Analysis, working, operational and Maintenance Procedure Analysis, Utility Data Analysis, Load Data Analysis, Analysis of Energy Consumption, Load Evaluation, consumption pattern and billing history, back-up systems and also the administrative requirements, assessment of safety concerns, assessment of operating and occupancy schedules for Equipment, Power Quality and Environmental Parameters Analysis, Efficiency and Wastage Analysis and assessment of potential risk factors.

Energy Audit is a process of systematic identification, quantification, recording, reporting and analysis of energy usage properties of institute. It aims to analyze within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Energy audit is a valuable means for an Institution related to educational area to determine how and where they are connected with Energy conservation drive of nation. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an eco-friendly view of life while making changes and planning for savings. It provides better understanding of impact of energy consumption on working conditions to staff and visitors. As the Energy availability is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to Energy availability and quality crisis. On this background it becomes essential to adopt the system of Energy efficient and safe Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. Moreover, it is social responsibility of a High energy consuming institution to ensure that they contribute towards the saving of Energy and thus making it available who are destitute in term of energy availability.

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### **1. Objective**

The Energy audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing Energy availability and quality. The institution has been putting efforts to keep reducing and standardizing energy usage since its inception. Therefore the purpose of present Energy audit is to identification, quantification, recording, reporting and analysis of components of Energy utilization and electrical safety properties of institute framework of energy conservation in compliance with the applicable regulations, policies and standards. The main objectives to carrying out the energy audit are:-

- To have overview of premises
- To record and document Utility data
- To record and document Load profile data
- To record and document basic Electrical Safety observations data
- To record and document Energy Conservations (if any)

### **2. Methodology**

The purpose of Energy Audit of is to ensure that the practices followed in the campus are in accordance with the Energy Conservation Policy of the Country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

The report is based on the documents obtained while on site, visual inspection and data collection carried out during the assessment period. All the measurements recorded on site are indicative loads and duties. All readings are collected for analysis and improvement planning. Cost estimates are indicative only as more detailed design and acceptance of suggestions will be required to improve the accuracy of these estimates.

The units are selected from SI (international standards) with meters, Celsius degrees, Etc.

### **3. Audit Statement**

The building is adopting the "Energy Efficient Campus" system for Energy conservation and sustainability. There are main three pillars i.e. Energy saving by technology and Operation & Maintenance procedures, safe working on occupational health and performance and 100% inmates demonstrating energy efficiency literacy. The goal is to maintain safe working environment, reduce energy consumption, while creating an atmosphere where inmates can work and live healthy.





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### 2. Topography

#### 1. Overview

SL No	Head	Details
1	Name of Applicant Institution	Uran Education Society's College of Management & Technology
2	Address	Palak Maidan, Bori, Uran Maharashtra
3	Contact Number	8108214659
4	Registration Certificate Number	F-173 COLABA
5	Sector Type	Education
6	Senior Management Contact	Dr. Minakshi Gupta
7	Contact Number	8108214659
8	Status of Institution (Pvt./Public)	Private
9	Company Turnover (Rs. In Lakhs)	Not Applicable
10	Number of Employees	13-15
11	Year of Establishment	2008
12	Plot Area (ft <sup>2</sup> )	Approximate 5700 ft <sup>2</sup>
13	No of Buildings	1
14	Building Type	RCC
15	Age of Building	20 Years
16	Leakages/Cracks on wall/roof	Minor
17	No. of workers (Footfall)	15 – 16
18	No. of Customers (Footfall)	300-350
19	Day Vs Night activity in %	Only Daytime
20	Shifts per day	1
21	Hours per shift	8
22	DG Set installed	Yes common for all premises
23	Inverter Installed	No
24	Renewable Energy System installed	No
25	(Solar/Wind/Biomass/Biofuel/Etc.)	No

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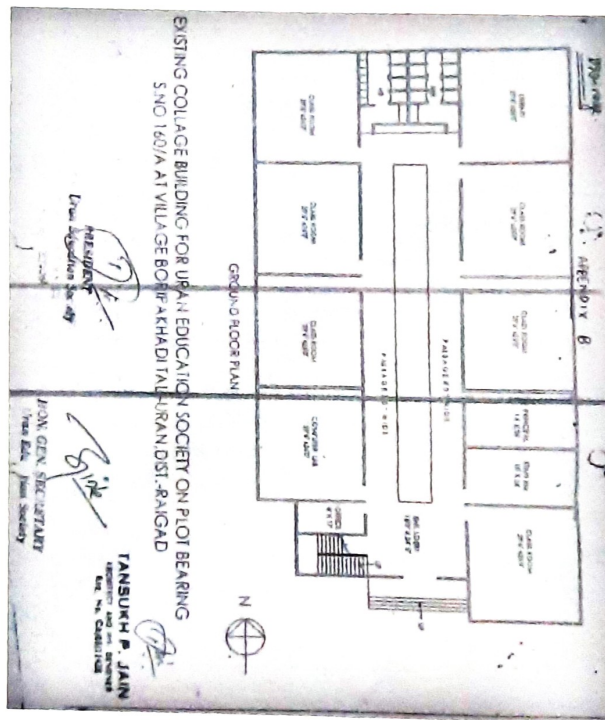
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**2. Location**

SL No	Head	Details	Remark
1	Name of Institute	UESCMT	
2	Category	College	Educational Institute
3	Address	Palak Maidan, Bori, Uran	
4	State	Maharashtra	
5	Nearest Railway Station	Panvel	Outstation
		Uran (proposed)	Local
6	Nearest Bus Station	Panvel	Interstate
		Uran	Intrastate
7	Nearest Airport	CSIA, Mumbai	
8	Longitude	18.882513	
9	Latitude	72.934656	

**3. Layouts**

**Floor Map**



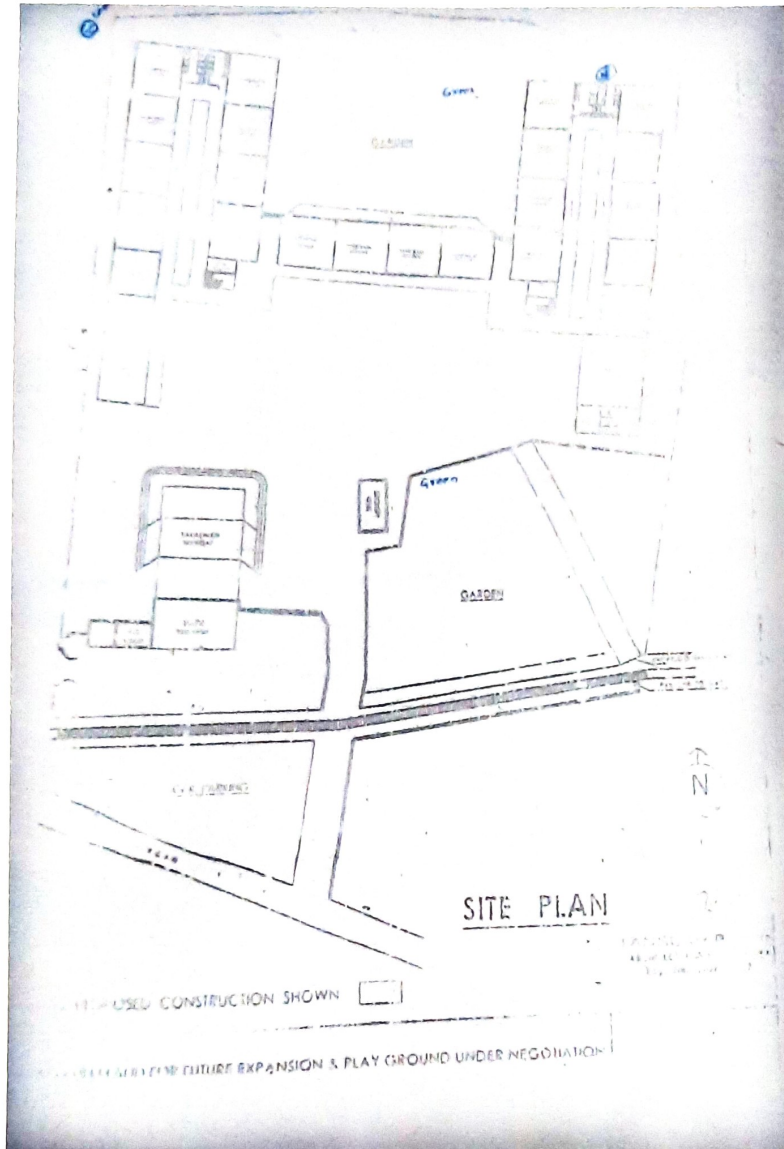




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### Site Map



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### Google Map



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### 3. Electric System

SL No	Specification	Value
1	Customer Account Number	025510197812
2	Meter No	078D0214818
3	Sanctioned Load (KW)	20
4	Contract Demand (KVA)	NA
5	DISCOM	MSEDCL
6	PHASE	THREE
7	BILLING UNIT	0337/URAN S/DN./PANVEL URBAN
8	POWER FACTOR	NA
9	PENALTY	NO

### 4. Billing Analysis

2021-22			
MONTH	UNITS	AMOUNT	RATE
APRIL	1708	11048	6.5
MAY	1903	12268	6.4
JUNE	2336	14974	6.4
JULY	2336	14974	6.4
AUGUST	2210	14187	6.4
SEPTEMBER	2487	15918	6.4
OCTOBER	2338	14987	6.4
NOVEMBER	2869	18305	6.4
DECEMBER	2644	16940	6.4
JANUARY	2438	15612	6.4
FEBRUARY	2347	15043	6.4
MARCH	3357	21726	6.5

2022-23			
MONTH	UNITS	AMOUNT	RATE
APRIL	2891	18483	6.4
MAY	1893	12235	6.5
JUNE	3120	22256	7.1
JULY	2955	21100	7.1
AUGUST	2449	17553	7.2
SEPTEMBER	3776	26855	7.1
OCTOBER	2782	19887	7.1
NOVEMBER	3260	23238	7.1
DECEMBER	3023	21576	7.1
JANUARY	2631	18828	7.2
FEBRUARY	2681	19179	7.2
MARCH	2855	20399	7.1

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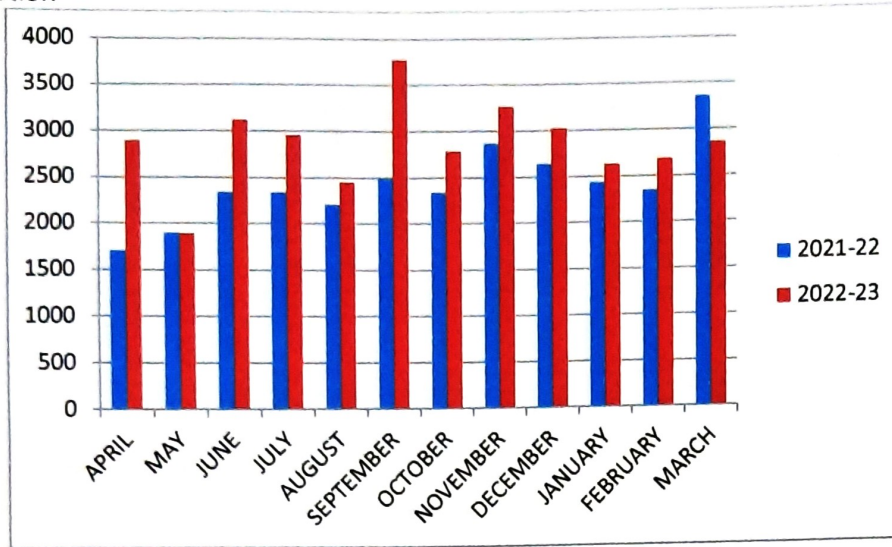
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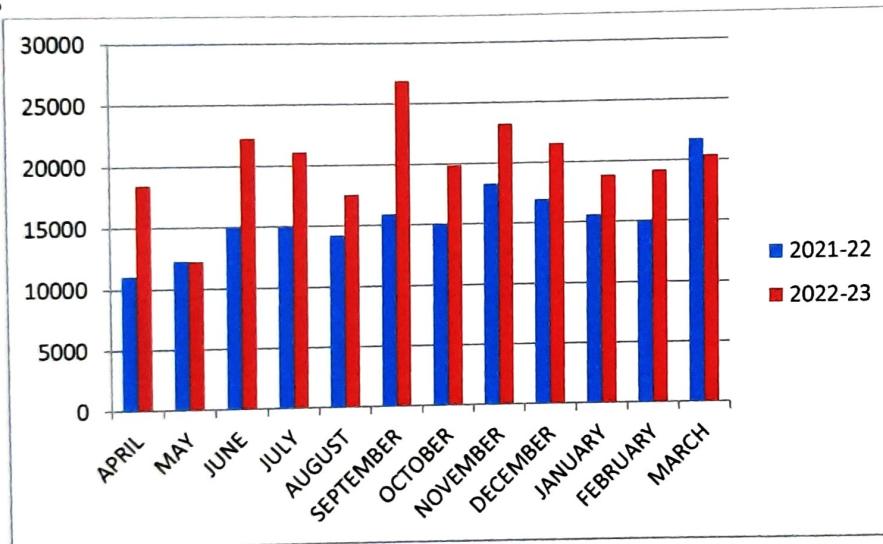
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## Consumption



## Expenses



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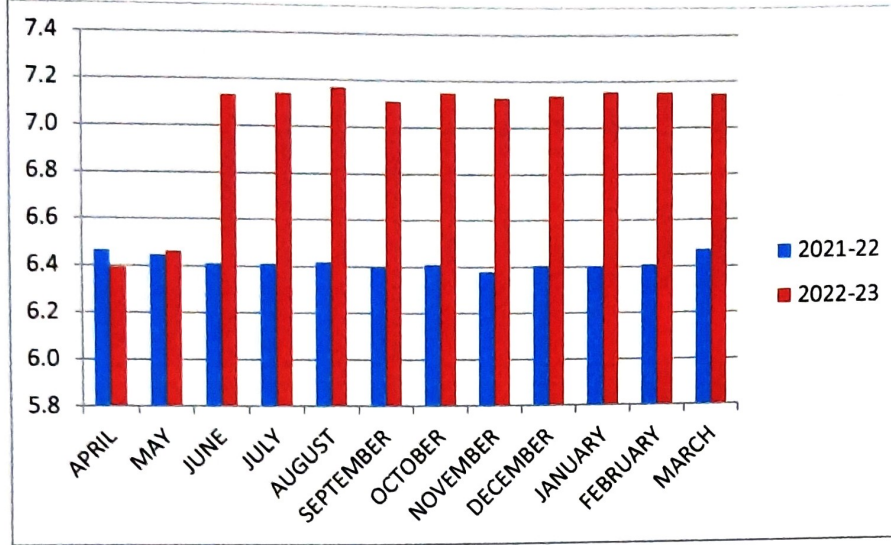




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### Unit Rate



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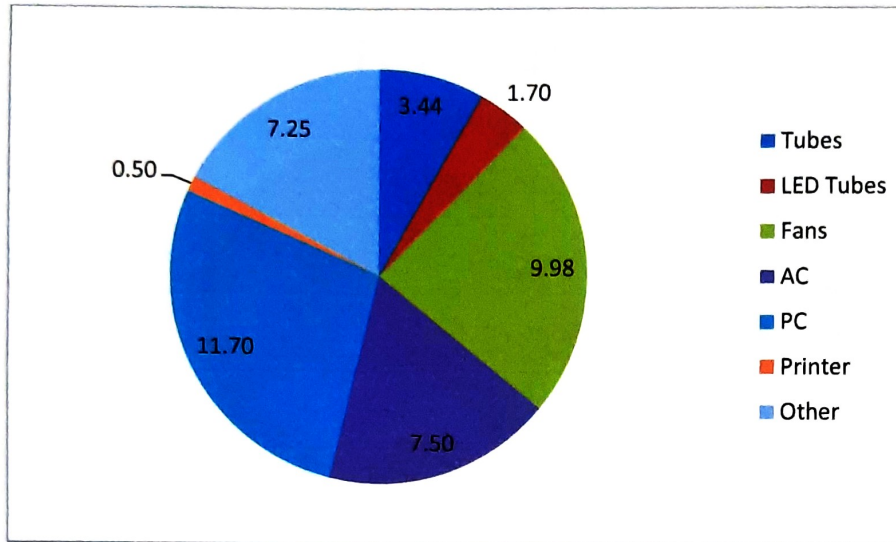
### 5. Connected Load Analysis

SL No	Floor	Room	Tubes	LED Tubes	Fans	AC	PC	Printer	Other
1	Ground	R-1	3	3	8	0	0	0	200
2	Ground	R-2	5	3	6	0	0	0	200
3	Ground	R-3	4	2	5	0	0	0	200
4	Ground	R-4	4	2	5	0	0	0	200
5	Ground	R-5	4	2	5	0	0	0	200
6	Ground	R-6	3	3	5	0	0	0	200
7	Ground	R-7	2	4	5	0	0	0	200
8	Ground	PC LAB-1	0	9	6	0	10	2	200
9	Ground	PC LAB-2	0	14	0	3	61	1	200
10	Ground	RECEPTION	8	3	6	0	4	0	200
11	Ground	PASSAGE	8	6	7	0	0	0	200
12	FIRST	R-1	4	2	9	0	0	0	200
13	FIRST	R-2	4	2	9	0	0	0	200
14	FIRST	R-3	1	3	7	0	0	0	200
15	FIRST	R-4	3	3	8	0	0	0	200
16	FIRST	R-5	2	2	5	0	0	0	200
17	FIRST	CHEM LAB	2	2	5	0	0	0	200
18	FIRST	PHY LAB	1	3	5	0	0	0	200
19	FIRST	BIO LAB	1	3	5	0	0	0	200
20	FIRST	OFFICE	26	10	15	2	2	2	3200
21	SECOND	LIBRARY	1	4	7	0	1	0	250

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Load	Tubes	LED Tubes	Fans	AC	PC	Printer	Other
Nos	86	85	133	5	78	5	7250
Load	3440	1700	9975	7500	11700	500	7250
Kw	3.44	1.70	9.98	7.50	11.70	0.50	7.25



## 6. Consumption Analysis

2021-22	Usage (Kwh)	Payment (Rs)	Duration
<b>Total</b>	28973	185982	Annual
<b>Min</b>	1708	11048	APRIL
<b>Max</b>	3357	21726	March
<b>Average</b>	2414	15499	Annual

2022-23	Usage (Kwh)	Payment (Rs)	Duration
<b>Total</b>	34316	241589	Annual
<b>Min</b>	1893	12235	MAY
<b>Max</b>	3776	26855	SEPTEMBER
<b>Average</b>	2860	20132	Annual

- 6.1.1. Average Consumption is increased
- 6.1.2. Maximum consumption month has been changed.
- 6.1.3. IOT based remote monitoring is recommended.

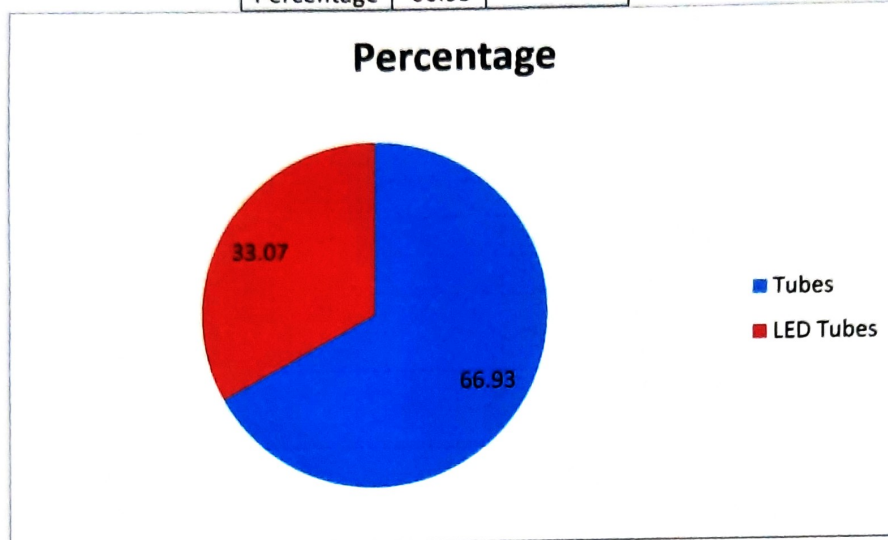


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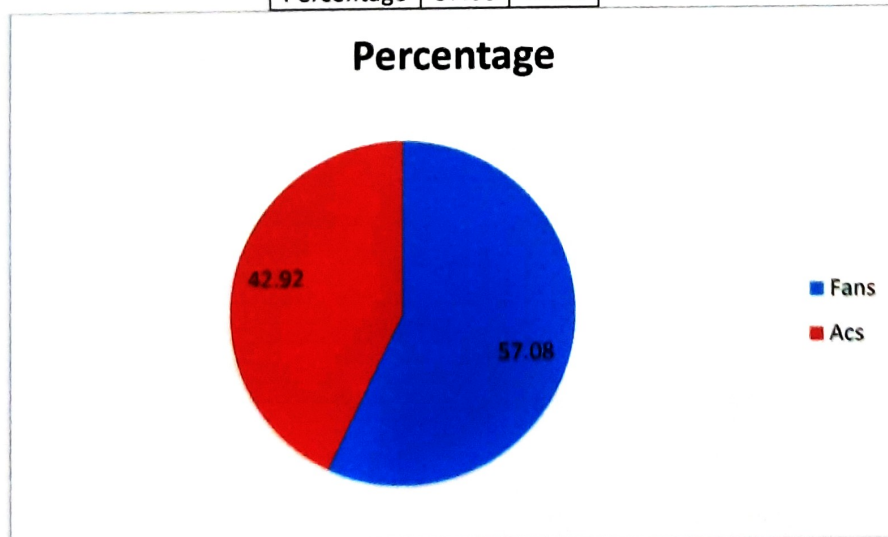
### 7. Lighting System Analysis

Load	Tubes	LED Tubes
Nos	86	85
Load	3.44	1.70
Percentage	66.93	33.07



### 8. Cooling System Analysis

Load	Fans	Acs
Nos	133	5
Load	9.98	7.50
Percentage	57.08	42.92



### 9. Renewable System Analysis

Proposed 50Kwp SPV GCRT Plant

Energy, Electrical & safety Audits | Solar and Electric Consultation | Power Management by IOT  
 Solar Rooftop EPC | New Electric Connections| Meters (New, Shifting, additional)  
 Load Management | Electrical Installation & Maintenance| Permissions, approvals, liasoning  
 Plot No. 108 / D - 8, Akshay Co. op. Society, Gorai- 1, Borivali (W), Mumbai-400092.  
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### 10. Conservation Analysis

#### 1. Lights

Approximate Saving In Traditional Light Fitting			
No	Particular	Value	Unit
1	Present Quantity of Service	100	Nos
2	Existing Energy Demand	40	W/Unit
3	Total Energy Demand	4000	Watts
4	Energy Demand of Solution	20	W/Unit
5	Reduction in Demand	2000	W/Unit
6	Average Daily Usage	8	Hrs/Day
7	Daily Saving in Energy	16000	Kwh/Day
8	Annual Working Days	225	Nos
9	Annual Energy Saving Possible	3600	Kwh/Annum
10	Rate of Electricity	7.2	Rs/Kwh
11	Annual Monetary Saving	25920	Rs/Annum
12	Price of Solution	800	Rs/Unit
13	Units Required	100	Nos
14	Investment Required	80000	Rs Lump Sum
15	Simple Payback Period	37.0	Months

#### 2. Fans

Approximate Saving In Traditional Fans Fitting			
No	Particular	Value	Unit
1	Present Quantity of Service	133	Nos
2	Existing Energy Demand	75	W/Unit
3	Total Energy Demand	9975	Watts
4	Energy Demand of Solution	35	W/Unit
5	Reduction in Demand	4655	W/Unit
6	Average Daily Usage	8	Hrs/Day
7	Daily Saving in Energy	42560	Kwh/Day
8	Annual Working Days	225	Nos
9	Annual Energy Saving Possible	9576	Kwh/Annum
10	Rate of Electricity	7.2	Rs/Kwh
11	Annual Monetary Saving	68947.2	Rs/Annum
12	Price of Solution	4000	Rs/Unit
13	Units Required	133	Nos
14	Investment Required	532000	Rs Lump Sum
15	Simple Payback Period	92.6	Months

Energy, Electrical & safety Audits | Solar and Electric Consultation | Power Management by IOT  
 Solar Rooftop EPC | New Electric Connections| Meters (New, Shifting, additional)  
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### 11. Suggestions:

1. Install IOT based Energy monitoring system.
2. Replace Traditional Lights with LED Tubes.
3. Replace Traditional Fans with BLDC Fans.
4. Put "SWITCH OFF" boards on back side of Doors.
5. Keep AC temperature to 26<sup>o</sup> C.
6. Clean Luminaries, Fans, ACs regularly to increase efficiency.
7. Prepare and observe SOPs for maintenance of equipments.

SL No	ENCON	Investment	Saving	Payback
	Suggestion	Rs	Rs/Year	Months
1	Replace TL with 20W LED Tubes	80,000	25,900	37
2	Replace Conventional Fans with BLDC Fans	5,32,000	69,000	93

### 12. Disclaimer

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

### 13. Conclusion

We hereby conclude report for "Energy Audit" of the institute has been done under scope of work for "Uran Education Society's College of Management & Technology, Palak Maidan, Bori, Uran Maharashtra". Please study it thoroughly and implement recommendations and suggestions at earliest.