ENERGY AUDIT REPORT
FOR
CHHATRAPATI SHIVAJI MAHARAJ INSTITUTE OF TECHNOLOGY

Elion Technologies & Consulting Private Limited

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Acknowledgement

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to Chhatrapati Shivaji Maharaj Institute of Technology, Panvel for entrusting the task of conducting energy audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.

Site Information

Name of College	Chhatrapati Shivaji Maharaj Institute of Technology
College Address	92/A Mumbai- Pune old Highway near Shedung Toll Plaza Shedung, Ta- Panvel, Dist- Raigad-410206
Execution Partner	ELION Technologies & Consulting Pvt Ltd
Communication Address	307, 3rd Floor DDA Lal Market H-Block Vikas Puri, New Delhi-110018
Date of Audit	16th January 2024
Year of Audit	2024 – 2025
Site Team who participated in the Study	Chhatrapati Shivaji Maharaj Institute of Technology
Main Energy Consuming Machines/Equipment's considered for Energy Audit	• Lighting & Fans • Air Conditioners • Motors & Pumps • Desktops & Printers

Executive Summary

Chhatrapati Shivaji Maharaj Institute of Technology, a premier Institute in Mumbai is firmly rooted and has been verdantly bloomed. It adopts an interactive approach in teaching which enhances creative thinking analytical findings and effective communicative skills. Keeping at pace with globalization and resurgence of an open economy, the Institute tries to equip the students with information and training in entrepreneurship skills and communication. We take pride in being a cohesive group who shares the fundamental aims the staff specializes in excellence and high standard achievers.

At Chhatrapati Shivaji Maharaj Institute of Technology, we believe in providing a holistic and enriching experience for our students. Our carefully curated events offer a diverse range of opportunities to explore passions, develop skills, and forge lifelong connections. From thrilling festivals and inspiring speaker series to engaging workshops and impactful social initiatives, we have something for everyone.

Our events foster personal growth, encourage collaboration, and celebrate the spirit of community. Whether it's showcasing talents, gaining practical skills, participating in sports competitions, experiencing cultural exchanges, or preparing for future careers, our event section is a hub of excitement and learning. Join us on this remarkable journey of self-discovery and create memories that will last a lifetime.

Stay tuned to our event section for upcoming events, as we continue to ignite curiosity and shape well-rounded individuals. Welcome to a world of opportunities, connections, and unforgettable experiences at Chhatrapati Shivaji Maharaj Institute of Technology.

Vision

St. Wilfred's is a conscious and thoughtful response to a critical need for excellent and relevant education in a traditional, innovative and creative frame work. We take pride in being a cohesive group who shares the fundamental aims where the staff specializes in excellence and high standards of achievements.

Mission

- To cater to multiple abilities & intelligence present in learners for realization of their true potential and individual needs of developments.
- To instill among the students a sense of responsibilities to participate in citizenship duties and strive towards common welfare.
- To nurture overall development of the students through enrichment and quality education.
- To promote involvement of students with community outside the college and other social concerns through community service program.

List of courses offered by the institute:

- BE Mechanical Engineering
- BE Civil Engineering
- BE Computer Engineering

Electricity is supplied by Maharashtra State Electricity Distribution Co. Ltd. and for backup power supply - DG set of rating 125 KVA (Kirloskar) is available.

Also, solar power plant of capacity 80KW is installed in the college.

The energy audit included detailed data collection, analysis of data and identification of specific energy saving proposals.

Chapter 01: Introduction

Chhatrapati Shivaji Maharaj Institute of Technology, Panvel evinced interest in availing the services of Elion Technologies and Consulting Pvt Ltd for conducting energy audit of their premises.

Elion Technologies and Consulting Pvt Ltd team conducted the Detail Energy audit on 12th April 2024.

This report is on the energy audit carried out in Chhatrapati Shivaji Maharaj Institute of Technology, Panvel. The detailed energy audit comprised of the following activities:

- Data collection of power consuming equipment's.
- A brief session on energy management was conducted to seek more inputs from the personnel engaged in operation and maintenance of electro mechanical services.
- Analysis of collected data.
- Discussion with the officials on the identified proposals.
- Discussion and reporting of the findings of energy audit with the Engineers and management staff.

All the identified energy savings proposals have been discussed with the executives concerned before finalizing the projects.

The contents of the report are based solely on the data provided by Chhatrapati Shivaji Maharaj Institute of Technology, Panvel officials during the energy audit.

The management should implement the suggestions made in the report after verifying requisite safety aspects.

Methodology for Energy Audit:

The following is a list of general procedure and information undertaken during the energy audit:

- General information of the site.
- Baseline energy description.
- Past energy consumption bills which include electricity bills.

- On site data collection
- Energy analysis of different sectors.
- Recommendation of energy conservation measures.

The primary goal of the energy audit was to identify sources and areas of potential energy savings and cost saving throughout the Plant by measures of optimization, replacement, retrofitting, and on the other hand, to also provide recommendations on operational and maintenance practices improvements.

Chapter 02: Energy Consumption Details

List of equipment present in the campus:

Rating of Transformer (in KVA)	630KVA
Year of installation of the Transformer	2023-24
Rating of DG Set (in KVA)	125KVA
Rating of Capacitor Bank (if present)	NA
Capacity of Solar Power Plant (if installed)	80 KW

The main areas of energy consumption as observed during the audit are as follows:

- Air Conditioners
- Lighting & Fans
- Motors & Pumps
- Desktops & Printers

The main sources of energy to meet the required consumptions are as follows:

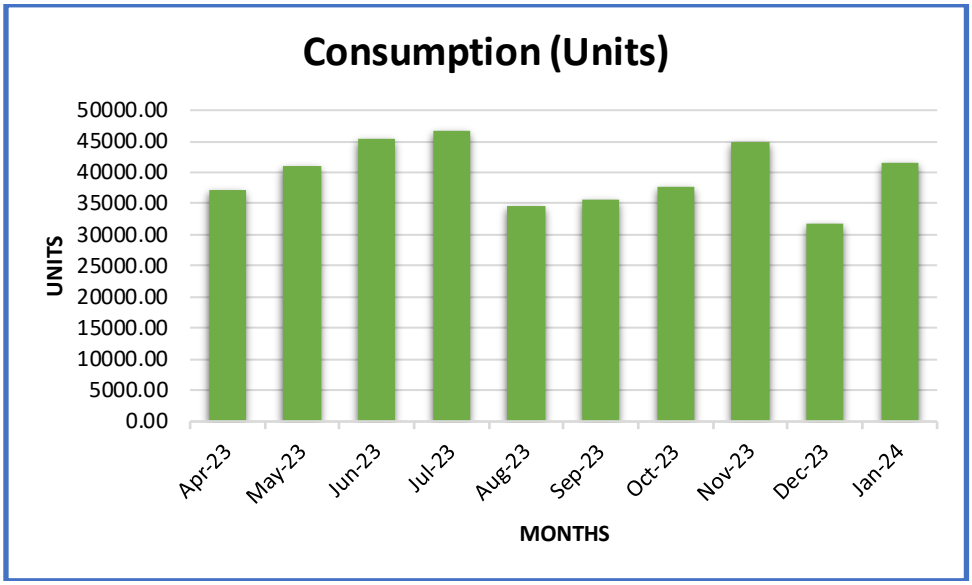
- Electricity supply from Maharashtra State Electricity Distribution Co. Ltd.
- DG sets of rating 125 KVA (Kirloskar).
- Solar power plant of capacity 80KW.

DG Set

Consumption pattern for energy is given below:

Available electricity bills for the year were collected and following is the summary for energy meter.

Bill Month	Consumption (Units)	Bill Demand (KVA)	Bill Amount
Jan-24	41589.00	125	730981.52
Dec-23	31878.00	98	537267.22
Nov-23	44965.00	126	734325.95
Oct-23	37809.00	130	646336.93
Sep-23	35701.00	132	612231.28
Aug-23	34514.00	112	565979.52
Jul-23	46633.00	125	746836.81
Jun-23	45408.00	113	711679.62
May-23	41147.00	121	668311.36
Apr-23	37290.00	98	546052.15


Consumption (Units)
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45000.00
40000.00
35000.00
30000.00
25000.00
20000.00
15000.00
10000.00
5000.00
0.00
UNITS
Apr-23
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Jun-23
Jul-23
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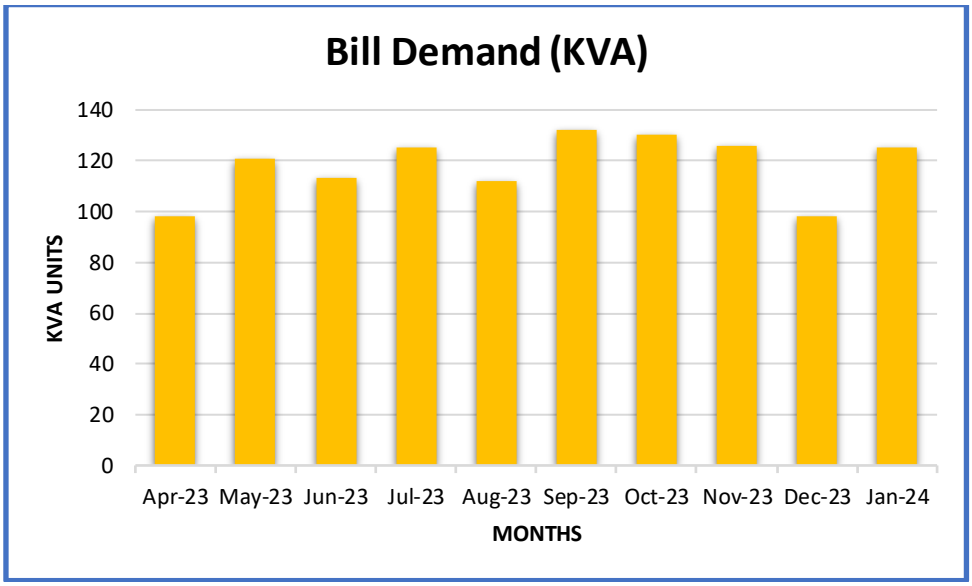
Nov-23
Dec-23
Jan-24
MONTHS


Bill Demand (KVA)
140
120
100
80
60
40
20
0
KVA UNITS
Apr-23
May-23
Jun-23
Jul-23
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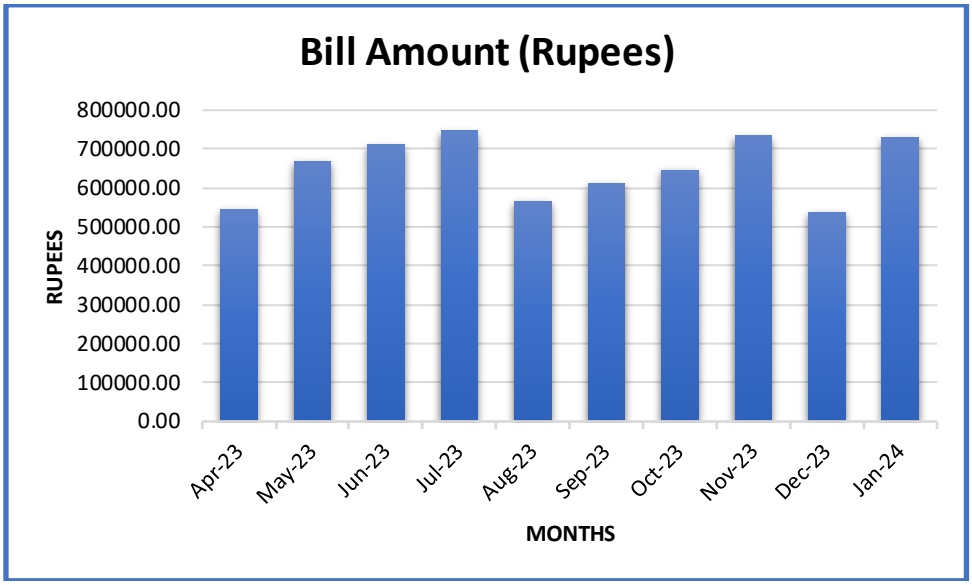
Oct-23
Nov-23
Dec-23
Jan-24
MONTHS


Bill Amount (Rupees)
800000.00
700000.00
600000.00
500000.00
400000.00
300000.00
200000.00
100000.00
0.00
RUPEES
Apr-23
May-23
Jun-23
Jul-23
Aug-23
Sep-23
Oct-23
Nov-23
Dec-23
Jan-24
MONTHS

Chapter 03: Lighting System

The lighting inventory of the colleges present in the university were collected and following is the summary:

Type of lights (LED/CFL/Conventional Bulb/Tube Light)	Location	Rating	Quantity	Number of Hours being turned on
LED Tube lights	Ground floor	10-20W	45	08
LED Bulbs and Tube lights	1st Floor	10-20W	64	08
LED Bulbs and Tube lights	2nd Floor	10-20W	47	08
Ceiling LED	3rd Floor	15-25W	15	08

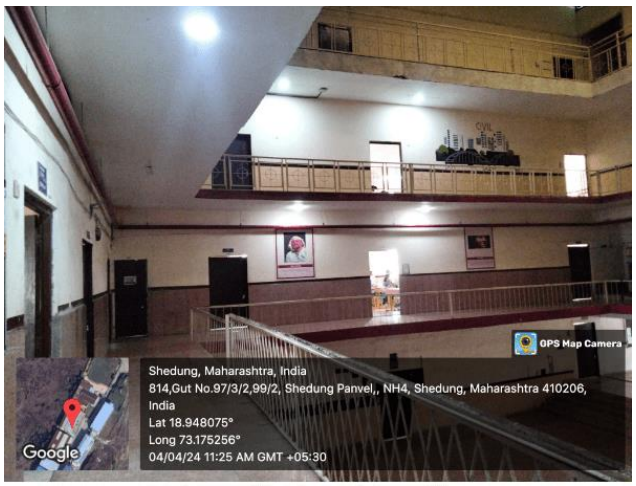
Observation:

It was observed that energy efficient LED lights are installed in the campus. College management has replaced all the conventional lights with LED lights.

Recommendation:

- Occupancy sensors can be installed in cabins and spaces where continuous lighting is not required.
- Sticker to SWITCH OFF LIGHT and SAVE ENERGY to be displayed.
- Regular cleaning of light fixtures to be done to get maximum lux level.

LED Lights in Corridor



LED Lights in Corridor

Chapter 04: Pumps and Motors

Pump is generally used for pumping of ground water to the water tank. The details of the pumps are given below:

Name of Pump and make	Running Hours	Rated Capacity in KW	Flow Rate	Head	RPM
Kirloskar Three phase Mono block	5 hrs.	10 HP	-	-	1500

Name of Pump and make	Discharge Pressure
Kirloskar Three phase Mono block	17.5 LPS

Observation:

All pumps and motors are functioning properly and well maintained.

Recommendation:

Proper maintenance and upkeep of pump and motor to be done.

Pump Name Plate Details

Pump Starter

Pump Borewell

Chapter 05: Air Conditioning

Split ACs are used in facility for air conditioning. Following is the list of ACs present in the campus:

Type of AC (Windows/Split/Package and Location)	Capacity in Ton	Whether any star rating available	Set Temperature	Running Hours	Whether AC performance is satisfactory (Yes/No)
Windows VOLTAS – Principal Office Room	1	2	26	13	Yes

Observation:

- All air conditioners are found to be functioning properly and well maintained.
- Most of the air conditioners used are 3-star which is a good practice.

Recommendation:

- All doors to be kept closed while using the air conditioners and regular annual service of AC's should be carried out.
- Set Temperature of Air Conditioner shall be maintained at 26°C.
- A reduction in 1°C set point temperature, the energy cost comes down by 5%. By carefully selecting the seasonal temperature in different areas as per requirement considerable saving on account of power consumption can be achieved.
- Whenever Air Conditioners are replaced in future, BEE 5 star rated air conditioners shall be considered which are energy efficient.
- University management should consider installation of programmable microprocessor-based energy saver for air conditioners to achieve savings up to 30%.

Window AC

Chapter 06: Photographic Evidence

DG Set Name Plate

DG SET

LED Lights

LED Lights

Conclusion

The energy audit conducted at Chhatrapati Shivaji Maharaj Institute of Technology, Panvel has revealed that college is doing good work in having sustainable college. Energy efficient LED lights are installed in the entire campus. To further reduce energy consumption, college should implement the recommendation made in report.

End of Report

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