



GOVERNMENT COLLEGE OF ENGINEERING AND CERAMIC TECHNOLOGY

Established 1941

Accredited by NAAC with Grade A

(2015)

7.1.6 Provide Links for any other relevant document to support the claim

Energy Audit Report

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ENERGY AUDIT REPORT FOR GOVERNMENT COLLEGE OF ENGINEERING AND CERAMIC TECHNOLOGY



Elion Technologies & Consulting Private Limited

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Acknowledgement

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to Government College of Engineering and Ceramic technology 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	Government College of Engineering and Ceramic Technology
College Address	73, Abinash Chandra Banerjee Ln, Subhas Sarobar Park, Phool Bagan, Belegghata, Kolkata, West Bengal, 700010
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	23 rd March 2021
Year of Audit	2020 - 2021
Audit Participants	Dr. Krishnendu Chakrabarty
Major Electrical Load	<ul style="list-style-type: none">• Air Conditioners• Lighting• Fans• Desktops & Printers



Executive Summary

Our College of Ceramic Technology was established in 1941 by Professor Sasadhar Ray who was an eminent and educationist and the first Principal of the college. At that time the college was named as Bengal Ceramic Institute Calcutta, which later on flowered into College of Ceramic Technology. Professor Ray was one of the pioneers in spreading ceramic education in India. He obtained his M.Sc. degree in Physics in 1930, as a student of Prof. Satyendranath Bose, from the University of Dacca having been placed first in Class. He was a research scholar under Prof. K. S. Krishnan-F.R.S. in the Indian Association for the Cultivation of Science and served as a supervisor in Peripatetic Demonstration for Scheme of the Govt. of Bengal to popularize the ceramic manufacturing processes in the villages. He also worked for a brief period in the Industrial Research Laboratory, Dept. of Industries, Government of West Bengal.

The college started with certificate and diploma courses in Ceramic Technology with six other different courses to train people for various ceramic industries in the eastern and other regions of India. Prof. Roy organized a commercial Training- cum- Production unit at the institute to provide employment through practical training to the students. He formulated many developmental schemes with their successful implementation and introduced the concept of self- employment in the institute to cope with the problem of growing unemployment in the country. He was the pioneer in India to manufacture bone chinawares using indigenous raw materials on commercial basis and glazed pottery, sanitary wares, tiles and low-tension insulators from Gangetic silt. His contribution to ceramic education and industry has gone far and near within India and round the globe.

In the year 1962, B. Sc (Tech.) degree course in Ceramic Technology under the University of Calcutta was introduced in the institute, which was then renamed as College of Ceramic Technology and was undertaken by the Govt. of West Bengal. At that time more emphasis was given on Traditional Ceramics. Traditional consists of pottery including materials, cement, etc. and traditional glasses for windows and containers/bottles including crystal glasses and of course the infamous optical glasses for our eyes and cameras.

Then came Dr. B. N. Samaddar as the Principal of the College, who was trained in MIT, USA. He brought a sophisticated touch of modern ceramics like Nuclear Ceramics, Space Ceramics, Electronic and Magnetic Ceramics, Bio-Ceramics, Piezoelectrics and Ferroelectrics by continuously enriching the courses with a strong emphasis on Materials Science.

This college has seen the addition of two new B.Tech courses in Information Technology and Computer Science & Engineering which was initiated under the West Bengal University of Technology in the year 2000 and 2001 as well as the M.Tech course in Ceramic Technology which was introduced in the year 2006. The B.Tech and M.Tech courses of Ceramic Technology and the B.Tech course in Information Technology has already been accredited by the National Board of Accreditation (NBA). The institute has also recently gained approval from AICTE to begin the M. Tech. course in Information Technology.



VISION

To cultivate excellence in various fields of engineering and technology by imparting core knowledge to the students and to transform the institution into a center of academic excellence and advanced research apart from producing skilled technologist.

MISSION

- To impart high quality technical education with ethical values that will produce globally competitive engineers & technologists.
- To inculcate entrepreneurial skill and leadership quality amongst potential students.
- To motivate students for acquiring and eventually generating advanced knowledge.
- To create compassionate, responsible and innovative global citizens
- To strengthen Institute-Industry interaction to make the students aware of real problems in the Industries and solutions thereof

List of courses offered by the institute:

- B.Tech.
- M.Tech.

Details of the infrastructure of the campus:

Total Area: 2.5 Acres

Green Area: 1 Acre



Chapter 01: Introduction

M/S Government College of Engineering and Ceramic Technology 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 23rd March 2021.

This report is on the energy audit carried out M/S Government College of Engineering and Ceramic Technology. 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 Government College of Engineering and Ceramic Technology 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 includes 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

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

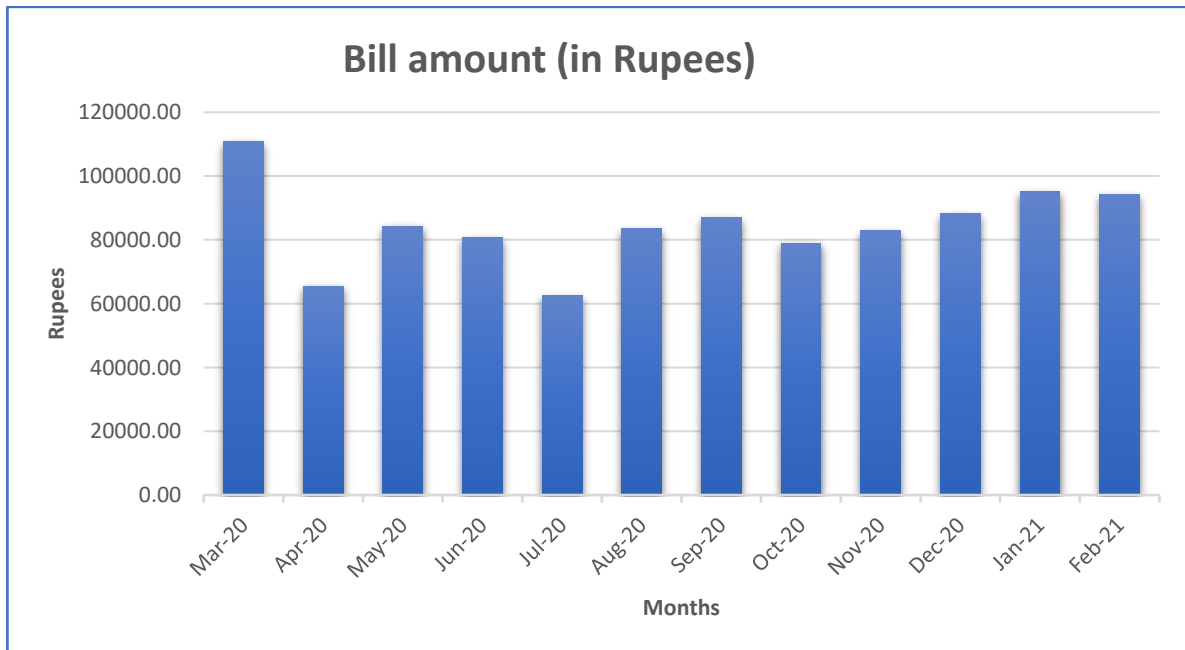
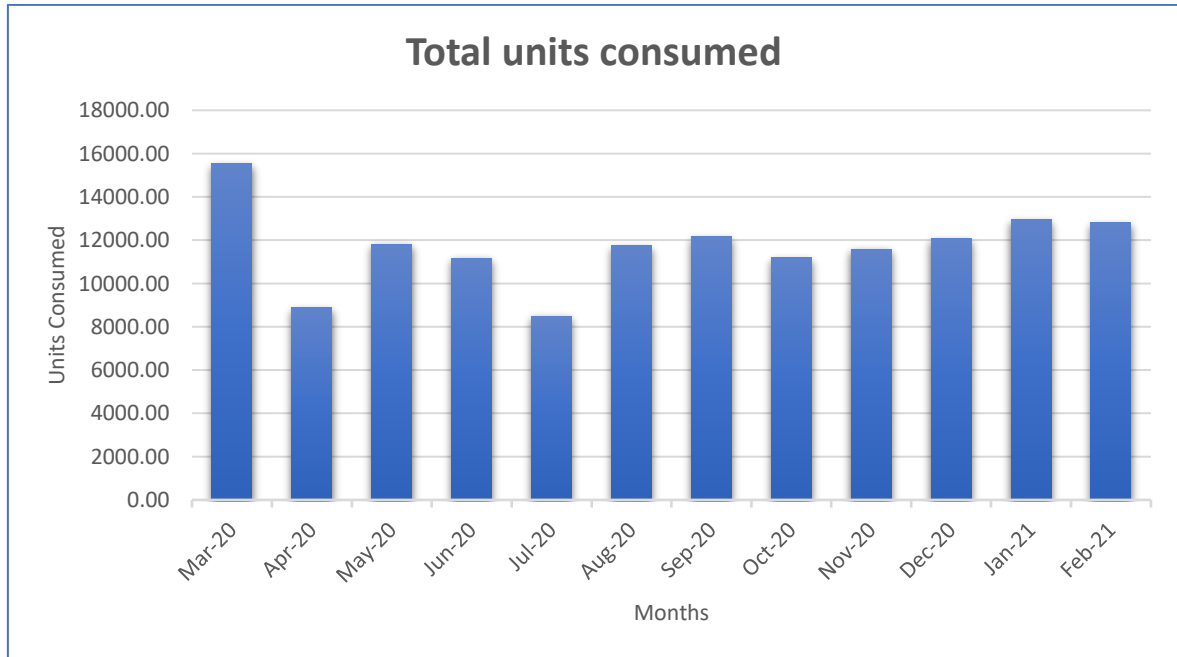
- Air Conditioners
- Lighting & Fans
- Motors & Pumps
- Desktops & Printers

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

- Electricity supply from Power Distribution Company.
- DG set.
- Solar Power Plant of capacity 8KW.

Consumption pattern for energy is given below:

Month	Total units consumed	Bill amount (excluding rebate, adjustment etc.) in ₹
Mar-20	15546.00	110881.00
Apr-20	8898.00	65498.00
May-20	11816.00	84322.00
Jun-20	11171.00	80814.00
Jul-20	8497.00	62461.00
Aug-20	11761.00	83529.00
Sep-20	12149.00	87066.00
Oct-20	11208.00	78960.00
Nov-20	11586.00	82847.00
Dec-20	12068.00	88269.00
Jan-21	12963.00	95107.00
Feb-21	12812.00	94284.00





Chapter 03: Lighting System

Following are the list of different types of lights installed in the campus:

Location	Type of Lights							
	4' single tube light fitting (LED)	4' double tube light fitting (LED)	4' single tube light fitting (Fluorescent)	4' double tube light fitting (Fluorescent)	2' X 2' False Ceiling LED fitting	9W Round False ceiling fitting (LED)	36W PL False ceiling fitting (CFL)	CFL Lamp
Main Gr F1	20	21	12	-	1	-	-	-
Main 1st F1	17	12	10	2	28	16	-	-
Main 2nd F1		11	2	3	3		9	-
Main 2.5 F1	6	16	-	-	-	-	-	-
Main 3rd F1	20	4	9	24	-	-	-	-
Main 3.5 F1	-	-	-	-	36	23	-	-
Main 4th F1	6	8	18	44	-	-	-	2
Main 5th F1	7	-	-	-	-	-	-	-
Workshop Block	14	-	10	21	13	-	-	-
Annex 1 (CSE)	10	11	5	-	-	-	-	2
Annex 2 (Canteen)	-	-	32	13	-	-	-	-
Gr F1 Gym block	3	13	-	-	-	-	-	-
Garden	-	-	-	-	-	-	-	-
Hostel	92	2	-	-	-	-	-	-
Auditorium	-	-	-	-	-	57	-	-



Location	Type of Lights								
	18W CFL single False ceiling fitting	18W CFL double False ceiling fitting	LED Lamp	Garden Light post LED	Gate light LED	Wall Bracket LED	Sodium/Halogen light	50W Round False ceiling fitting (LED)	LED Flood Light
Main Gr F1	-	-	-	-	-	-	-	-	-
Main 1st F1	-	-	-	-	-	-	-	-	-
Main 2nd F1	-	-	-	-	-	-	-	-	-
Main 2.5 F1	-	-	-	-	-	-	-	-	-
Main 3rd F1	-	-	-	-	-	-	-	-	-
Main 3.5 F1	-	-	-	-	-	-	-	-	-
Main 4th F1	-	-	-	-	-	-	-	-	-
Main 5th F1	7	57	2	-	-	-	-	-	-
Workshop Block	-	-	-	-	-	-	-	-	-
Annex 1 (CSE)	-	-	-	-	-	-	-	-	-
Annex 2 (Canteen)	-	-	8	-	-	-	-	-	-
Gr F1 Gym block	-	-	2	-	-	-	-	-	-
Garden	-	-	-	12	4	29	7	-	-
Hostel	-	-	-	-	-	-	-	-	-
Auditorium	-	-	-	-	-	-	-	10	-

Observation:

Most of the lighting used are LEDs. Fluorescent lights are being used at certain locations. It was informed that college is in process of replacement of old conventional lights with energy efficient LED lights.

Recommendation:

- Sticker to SWITCH OFF LIGHT and SAVE ENERGY to be displayed.
- Regular cleaning of light fixtures to be done to get maximum lux level.





Chapter 04: Fans

Following are the list of fans and exhaust fans installed in the campus:

Location	Type of Fans			
	Ceiling Fan (Old)	Ceiling Fan (New)	Wall Mounted Fan (New)	Exhaust Fan
Main Gr F1	20	-	-	3
Main 1st F1	9	10	13	4
Main 2nd F1	3	8	10	-
Main 2.5 F1	-	16	-	-
Main 3rd F1	19	-	-	-
Main 3.5 F1	-	-	13	-
Main 4th F1	6	7	-	3
Main 5th F1	37	66	5	-
Workshop Block	-	11	13	9
Annex 1 (CSE)	12	10	-	-
Annex 2 (Canteen)	1	10	4	10
Gr F1 Gym block	12	3	-	4
Garden	-	-	-	-
Hostel	-	64	-	-
Auditorium	-	-	-	-

Observation:

All the fans were found to be functioning properly. Few fans have been replaced in the recent times.

Recommendation:

Typical ceiling fans made with the conventional design are made of single-phase induction electric motor. Most of the prevailing fan manufacturers used aluminium than copper in the fan, as it is cheaper. But aluminium is less energy efficient. The end result is that most of the traditional technology fans consumed about 70-80 watts of electricity. The air delivery of these fan ranges between 210 to 250 m³/min.

The super-efficient 5-star rated BLDC fans are 5-star rated consuming 25-40 watts of energy, which is about 40-70% less than the regular old fans. Also, BLDC fans do not



require installation of an additional regulator which saves 200-500 rupees upfront. Instead, they are controlled wirelessly with the help of remote just like air conditioners.

Prominent advantages of BLDC motor over induction motor is summarized as:

- Lower Electricity Consumption (65% savings)
- Longer backup on Inverters (even on Solar)
- Improved reliability
- Noise reduction
- Longer lifetime



Chapter 05: Air Conditioning

Following is the list of air conditioners present in the campus:

Location	Air Conditioners
Main Gr F1	57
Main 1st F1	
Main 2nd F1	
Main 2.5 F1	
Main 3rd F1	
Main 3.5 F1	
Main 4th F1	
Main 5th F1	
Workshop Block	-
Annex 1 (CSE)	10
Annex 2 (Canteen)	17
Gr F1 Gym block	-
Garden	-
Hostel	-
Auditorium	32

Observation:

- All air conditioners are found to be functioning properly and well maintained.

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.



Conclusion

The energy audit conducted at M/S Government College of Engineering And Ceramic Technology has revealed that college is doing good work in having sustainable college. Campus has a fully functional solar power plant and the campus is net energy positive. To further reduce energy consumption, college should implement the recommendation made in report.

End of Report



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DISCLAIMER

All information contained in this report is based on the data available and observations made during the audit. All recommendations made in this audit report should be duly evaluated by the management before implementation.

Elion Technologies and Consulting is not liable for any damages incurred by the organization through implementation of the energy saving proposals either to it or to any third party getting impacted by the implementation of this report.

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