ENERGY AUDIT

STUDY PERIOD (ONE YEAR) 2023 - 2024

AUDIT REPORT

Studied for

Samridhi Sarwajanik Charitable Trust's

Jhulelal Institute of Technology

Kh.No.68/1/2/3/72, Off Koradi Road,
Lonara,Nagpur – 441111,
Maharashtra, India

ZESTA

Disclaimer

The Audit Team has prepared this report for the **Samridhi Sarwajanik Charitable Trust's Jhulelal Institute of Technology** located at Kh.No.68/1/2/3/72, Off Koradi Road, Lonara, Nagpur – 441111, Maharashtra, India based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon"ble Management and College. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

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Acknowledgement

The Audit Assessment Team thanks the **Samridhi Sarwajanik Charitable Trust's Jhulelal Institute of Technology, Maharashtra** for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Hon'ble Mahesh Sadhwani, Chairman; Pramod Pampatwar,** Director Technical, **Dr. Hemant Asarani,** Dean Admin and Director and everyone from the Management.

Our heartfelt thanks to **Dr. Narendra G. Bawane,** Principal and or the valuable inputs.

We are also thankful to College's Task force the faculty members who have collected data required for green audit Prof**. Yuvraj Chavhan,** Assistant Professor, Department of Electrical Engineering for the inventory and data collection.

We highly appreciate the assistance of **Office Superintendent, Accountant** and the **entire Teaching, Non-teaching and Admin staff** for their support while collecting the data.

ZESTA (Zest Energy Solutions and Training Academy)

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Contents

1. Introduction

About the College

Jhulelal Institute of Technology is governed by Samridhi Sarwajanik Charitable Trust with a noble cause of providing quality technical education to the students in Central India. The society has eminent persons from the fields of technology and education on its governing body and academic advisory council.

The College is situated in a pleasant natural setting, 12 km away from the zero miles, off Koradi road. The peaceful environment in the campus provides ideal atmosphere foracademic pursuit, concentrated studies and research. Over the years the College has maintained our position amongst one of the top unaided engineering colleges of the region.

Populace analysis for Academic year 2023-24

Students data

The student data (shared by the College) shows there were a total of **870 Boys and 709 Girls** students thus **a total of 1,579 students** in the premises.

Staff data

The staff data shows the premises had a total of **106** Staff Members.

Total College Area & College Building Spread Area

The total site area is 5.11 Acres and the total Built-up area of College is 1,32,079 sq. ft. for a total of 1,599 footfalls.

Timeline of activities for Green Building Study Audit

- Discussion with the College
- Allotment and Initiation by the College
- Process discussion with team
- Data submitted by College
- Submission of the Report

MoU's and Collaborations

The College has extended its Industry connect by being associated with reputed firms for educational and research exposure. The details of the recent collaborations are documented below; in addition to the Academic courses of Computer Science Engineering, CSE(Artificial Intelligence & Machine Learning), Electronics & Telecommunication Engineering, Electronics and Computer Engineering, Advanced Communication Technology, Electrical Engineering, Mechanical Engineering, Master Of Technology, Master Of Business Administration.

Sr no	Name of Agencies	Year of signing MoU / linkage	Tenure	Exercising Authority
1	Revat Networks, Nagpur	2023-24	1years	JIT (Dept. of ME)
2	Live TechSkills Solution Nagpur	2023-24	3years	JIT (Dept. of EE)
3	Shopcardd Business Solution, Nagpur	2023-24	3years	JIT (Dept. of MBA)
4	Risewell Cybersecurity Solutions Pvt. Ltd., Nagpur	2023-24	1years	JIT (Dept. of CSE)
5	IT Networkz Pvt. Ltd , Nagpur	2023-24	1years	JIT (Dept. of AIML)
6	Risewell Cybersecurity Solutions Pvt.Ltd	17th March 2023	3years	JIT (Dept. of CSE)
7	Maximum Solutions Nagpur	10th March 2023	3years	JIT (Dept. of EE)
8	NU Intelligence Pvt.Ltd Nagpur	01st October 2023	3years	JIT (Dept. of EE)
9	NU Intelligence Pvt.Ltd Nagpur	08th December 2022	3years	JIT (Dept. of ETC)
10	RCOEM- Tata Technologies Centre for Invention, Innovation & Training(CIIT)	19th January 2023	3years	JIT (Dept. of ME)
11	VNIT,Nagpur – V R Jamdar Siemens Center of Excellence	16th January 2023	3years	JIT (Dept. of ME)
12	NU Intelligence Pvt.Ltd Nagpur	19 st October 2023	3years	JIT (Dept. of ME)
13	EDU PLUS NOW Learning System Pvt Ltd, Nagpur	14th November 2022	3years	JIT (Dept. of ME)
14	Widesoftech Pvt Ltd	16th September 2022	3years	JIT (Dept. of MBA)
15	Data Council Nagpur	14th September 2022	3years	JIT (Dept. of MBA)
16	Green Engineers Nagpur	21st April 2023	3years	JIT (Dept. of T&P)

Table1:Details of the MoU's anD collaborations

Awards

The College has received the following achievements recently.

- Best Engineering College In Vidarbha by ET ICONS OF Nagpur 2023
- Dr. Roopesh Rao Dean, Training & Placement JIT Awarded with Outstanding Contribution in the Field of Training & Placement Award by Mauli Group
- Prof. Anurag Karande Awarded with best paper award in the international conference on technological innovations and application in industry 4.0 organized by St. Vincent pallotti College Nagpur
- Rotaract Club of JIT has Received the prestigious DRR Citation Award and the Award for Outstanding Work in R.I.D.E during RIY 2023-24 from Rotaract District 3030!

1. Audit inferences 203-24

As the College had undergone a for the Audit of Academic year 2022-23, a data collection process for verification purposes were asked to be submitted. The report has been prepared based on the inputs provided for immediate action for improvement in this subject.

Positive points that are implemented as per previous Report

- In the previous year there were certain CFL and Non-LED lights, these are now replaced with LED lights. The College is thus now a 100% LED premises. total of 714 Light sources are available in Campus.
- Institute has 50KW Capacity Solar Roof top installation to conserve energy by using solar renewable energy. This helps in improving environment quality by controlling pollution.
- Institute promoted use of Electric vehicles as its future need. Institute has electric charging points , E-Rickshaw, E-Bicycle There are many projects done by students to promote use of Electric vehicles, solar system.

Section-wise recommendation related to 'Equipment'

The following points are listed as value addition to the existing premises, are should be considered as ***first Priority*** for implementation under section wise study. These have to be ***implemented in the next 1 year of the submission of the Report.*** Owing to the excellent practices adopted at present, the numbers of recommendations are less for this section.

Desktop computers to laptops

Among all equipment, it suggested replacing the desktop computers with laptops as this would be energy efficient. A normal desktop computer consumes an average of 250W and it is to be connected all time when it has to be used. On the contrary, a laptop consumes 40W and has a battery backup that lasts up to 4 hours. There is **an average 84% reduction** in energy consumption if replaced with an energy-efficient appliance which is a laptop in all the areas. This replacement is however dependent on a variety of factors as follows.

- **Some of the senior staff** members may be more convenient with computers; replacement with a laptop might result in a change of the working patterns and hours which may affect the productivity.
- **Laptops** in case are not handled with care such as if dropped unintentionally might result in data imbalance.
- **Students who are not day scholars** can use a laptop at their convenience; whereas in common areas there can monitor of the usage hours hence computers may be a preferable option then laptops in certain spaces.
- Institute has Total 430 computers in use

Thus the Institute should analyze the above points and then devise a strategy for the replacement, when the devices get damaged or are not in working condition.

Ceiling Fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 60W when in use. These should be replaced with energy efficient fans consuming 35W when in use.

Our detailed study states that is all the **ceiling fans on all floors** if replaced with star rated appliance results in a reduction of average of **42% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if college can have certain plans else the replacement can be done when fans get damaged or are not in working condition **as currently the energy efficient appliances are available in the class rooms and the Staff rooms & remaining areas Like Virtual Room, Auditorium, Library, Computer centre, EIIC, SPORT ROOM, Reception, Toilets /coriders, T&P, principal Room, Accounts Section, Management Room, HR Room, Canteen, PR Office, Medical Room, Gym, Music Room their count**

Particulars	count
Air Conditioners	35
Air Cooler	17
Computers	422
Fan celling	475
Fan Exhaust	24
LED LIGHTS	714
Printer	27
Projector	24

Facility management systems, controls (Smart premises)

The College has extreme potential to become 100% energy efficient premises. In addition to provisions in the electromechanical system some facilities can be introduced towards building management systems as well. These can be undertaken equally for educational and residential sections. (Includes electromechanical systems – Electrical, Water)

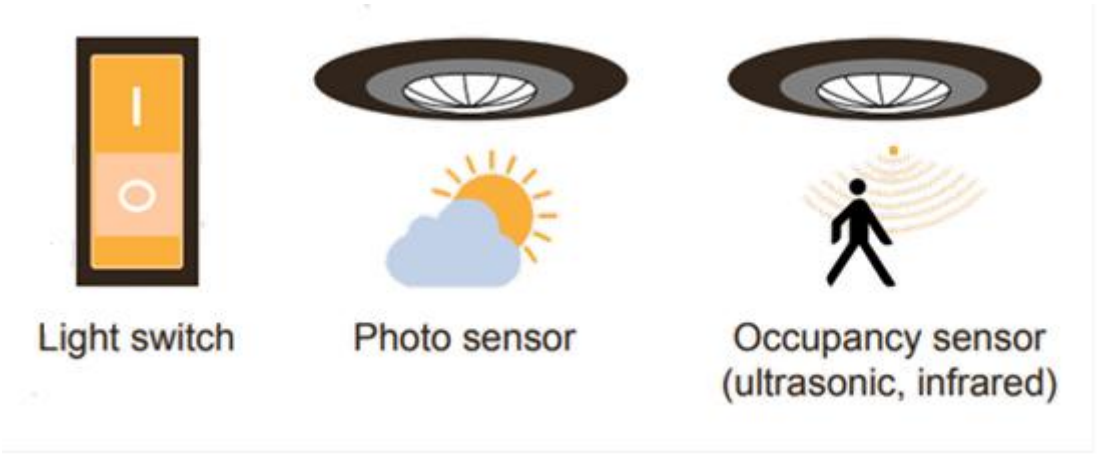


Plate 1: Understanding the lighting concepts

The above diagram provides a detailed study of how the system controls should be incorporated in the premises as fare as lighting systems are considered. The suggesting for this sub-section are listed below.

- Install PIR control of the lighting in the toilet areas.
- Install low flow taps with automatic shut off in the toilets.
- Install push button timer control in all rooms lighting and ceiling fans.
- Install audible alarms on the laboratory doors to ensure doors remain closed at all times.
- Install Power Electronics control of the Foyer notice board lighting.
- Use of photo sensor switch for street light controlling helps in conserving the lighting energy.

Other equipment

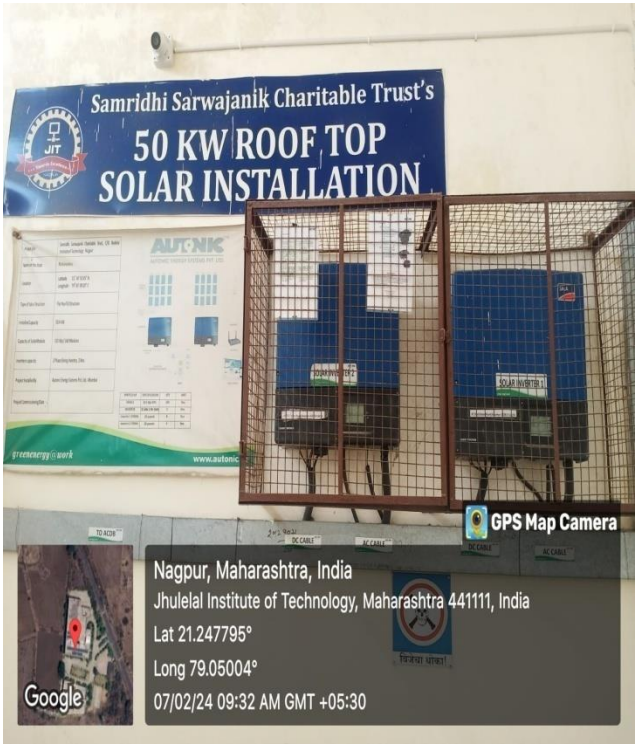
The following recommendations are for the other equipment in the premises.

- Backup computer files during vacations.
- Refrigerators and all electronic equipments should be cleaned out completely including system check up with AMC during vacations, this should be a periodic activity and the same should be documented every year

On-site investigation and physical verification

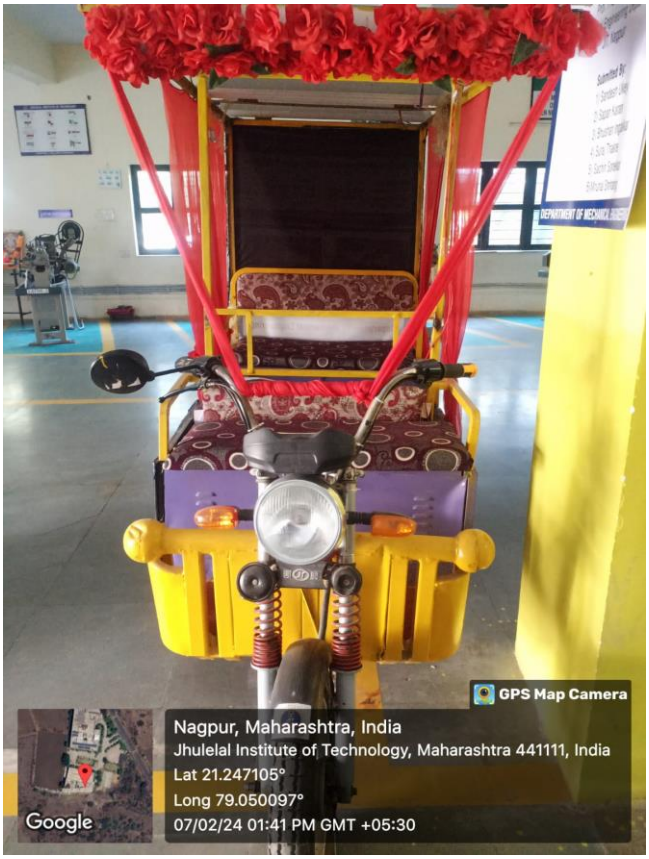
Battery charging are in the College

Wheelchair facility



50KW ROOF Top Solar System to improve Renewable energy

E-Bicycle



E-Rikshaw

Energy Efficient Lighting System

2. 3.References

The study is based on the data collected, analysed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere.These are used as a base to analyse and study the data collected.

Specific references for study related to energy

- https://www.energy.gov/eere/buildings/zero-energy-buildings
- https://www.dsaarch.com/zero-net-positive-energy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INSTITUTE