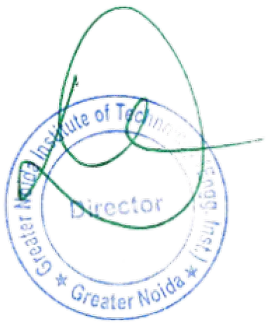
7.1.3
Energy Audit Report



Greater Noida Institute of Technology (Engg. Institute)

Plot No. 7, Knowledge Park II, Greater Noida
Uttar Pradesh 201310 India

Name of the Organization	Greater Noida Institute of Technology(Engineering Institute)	
Address	Plot no 7 , KP: 2, Greater Noida, Uttar Pradesh	
Site Address (If any)	Same	
No. of Employees	300	
No. of Shift	1	
E mail id	info@gniot.net.in	
Contact Person	Mr. Kapil Kumar	
Telephone/Fax	0120-2328214	
Scope	Education	
Technical Area	Engineering Institute	
Audit Team	Lead Auditor: Mr. Kapil Auditor: Technical Expert	No of Mandays: 10
Starting date of Audit	10.04.2020	
End date of Audit	20.04.2020	
Brief about the organization	Established in the year 2001, GNIOT group of institutions has become one of the leading institutions for management and engineering programs worldwide. Our aim is to educate leaders who build a strong organization and wisely leverage the power of markets to create lasting value	
Purpose of Audit	To verify the implementation of the Energy Management System as per the ISO 50001:2018Standards Requirement, verification of records for the conformity of the implementation.	

CHANGE DETAIL:

Audit Duration for Stage 2	
Are quoted man-days adequate?	Yes
Any change in employee detail?	No
Any Change in Scope?	No
Any additional Information:	Nil

Director

ATTENDENCE SHEET:

NAME OF PERSON	DESIGNATION
SHELLY GARG	Professor
RAMVEER SINGH	Professor
RAJDEV TIWARI	Professor
BRAJENDRA SINGH CHAUHAN	Professor
RAVINDRA KUMAR	Professor
SUDHIR KUMAR	Professor
RAVINDRA KUMAR	Professor
KIRTI UPADHYAY	Professor
MAHIPAL SINGH RAWAT	Professor
ARUN KUMAR SINGH	Professor
SHELLY GARG	Professor
RAMVEER SINGH	Professor
NITASH KAUSHIK	Professor
MANOJ SINGHAL	Professor
RATAN LAL SHARMA	Professor

Director

SUMMARY OF AUDIT

AREA OF IMPROVEMENTS	
	Internal Audit con be more detailed
	Awareness Training about IA
	More awareness about saving power

Non Conformities Raised

____Minor Non-conformance identified in the Stage 2audit, details of Non Conformance in F50

Please respond by using your own corrective action form and include the root cause analysis with systemic corrective action. Failure to include root cause analysis with systemic correctiveaction will result in your responses being rejected by Lead Auditor

Team Leader Declaration (Tick or cross Each Column as per applicability)	
√	Auditing is based on a sampling process of the available information
X	Audit is combined, joint or integrated;
√	The effectiveness of corrective actions taken regarding previously identified
√	nonconformities has verified
√	outcomes are effective and complying.
√	The internal audit and management review process are effective and complying with the requirements.
√	The scope of certification is appropriate.
√	The capability of the management system to meet applicable requirements and expected
√	The audit objectives has been fulfilled and achieved.

Recommendation:

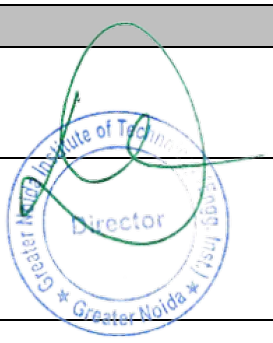
Yes	**The quality system complies with the requirements of the reference standard:**Congratulations, on the basis of the above summary, Lead Auditor is pleased to put forward a recommendationfor Issuance of Certificate. The organization can use the Mark
	The quality system complies with the requirements of the reference standard with exception of minor NC: Congratulations, Team Leader is pleased to put forward a recommendation for Issuance of the certificate of Organization upon off-site verification of closure of all minor NC within 60 days from the date of Stage 2 audit. Responses to the non-conformances should be submitted and must include supporting evidence of closure to allow for off-site verification. In responding to the non-conformances, the organization should consider the root cause of the non-conformance and the potential for related issues in other parts of system. If all non-conformances are not closed within 60 days, a full reassessment may be required.
	Evidence of major non conformities: Organization is not recommended for Issuance of Certificate and at this time. Follow-upaudit will be scheduled to allow for on-site verification and closure of all issues within 60 days from the date of Stage 2. Once all non-conformances are closed, the recommendation for Issuance of certification may recommended. If all non-conformances are not closed within 60 days, a full reassessment may be required.
	Not Recommended: Organization is recommended for Issuance of certificate at this time. Full Stage 2 audit is required as the organisation has not implemented the system and process at pace.
	Proposed Audit Date for 1st Surveillance Audit ……(mm/dd/yy)

Sign Off :(Date)	
Report Submission	Client Acceptance for Report
Name of Team Leader: Signature:	Name: Sign Designation:

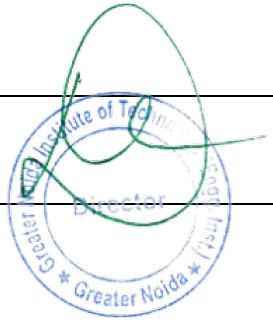
AUDIT CHECKLIST

VERIFICATION OF DOCUMENTED INFORMATION& RCORDS AS PER STD REQUIREMENT
(C- Conformity, NC-Non Conformity, O-Observation)

Clause Number	C/NC/O	Document Verification detail with statement of Conformity
4 Context of the organization		
4.1 Understanding the organization and its context (External and Internal Issues)	C	Reference document Annexure 1
4.2 Understanding the needs and expectations of interested parties (Need & Expectation of Interested parties)	C	Reference document Annexure 2
4.3 Determining the scope of the energy management system	C	Verified
4.4 Energy management system	C	Verified
5 Leadership		
5.1 Leadership and commitment (Ensure Top Management Commitment)	C	Verified,
5.2 Energy policy (Documented, communicated, availability and Review)	C	Documented and displayed
5.3 Organization roles, responsibilities and authorities (Assigned and communicated by Top Management)	Mi-1 Mi3	Verified , Doc/EnMS/07 Appointment letter MR not evident Document number not correct on Responsibility Matrix
6 Planning		
6.1 Actions to address risks and opportunities	C	Checked
6.2 Objectives, energy targets and planning to achieve them (Consistent with Energy Policy, SEU, documented, measurable, communicated and updated)	C	Verified, R/Obj-Tar/23



6.3 Energy review (Current type of energy use, past and current consumption, documented and updated)	C	Ok, R/Eqpt E comp/21
6.4 Energy performance indicators (Documented and updated)	C	Yes, verified
6.5 Energy baseline (Documented and review periodically and retention)	C	Checked
6.6 Planning for collection of energy data (Accuracy and repeatable, documented and retention)	C	Verified
7 Support		
7.1 Resources (Determination of resource required)	C	Yes
7.2 Competence (determine, documented and retain the competence)	C	Yes
7.3 Awareness (Objective, Policy, Non Conformance of EnMS)	C	Yes
7.4 Communication (What, When, With Whom, How & Who)	C	Verified
7.5 Documented information (Creation, Updating, Control, Retention, External Origin, Storage & Preservation)	C	Yes
8 Operation		
8.1 Operational planning and control (Documneted, Plan, Implement, Control the process related to SEU and communication)	C	Verified
8.2 Design (Documented, Specification, design consideration)	C	Verified
8.3 Procurement (Establish & Implement criteria for evaluating energy performance)	C	Verified R/AECP/10
9 Performance evaluation		
9.1.1 General (Monitoring, measurement, analysis and evaluation of energy performance and the EnMS)	C	Verified
9.1.2 Evaluation of compliance with legal requirements and other requirements	C	Verified R/LR/05



9.2 Internal audit (Frequency and Effectiveness)	Mi 2 Obs 1 Obs 2	Verified, R/IA/02 & EnMSp-05, Internal Audit checklist not completed Internal Audit con be more detailed Awareness Training
9.3 Management review (Frequency and input/output)	C	Verified, R/MRM/11 & EnMSP- 08
10 Improvement		
Nonconformity and corrective action	C	Verified
Continual improvement	Obs 3	Verified More awareness about saving power

Reflections on the Results of the Energy Audit

10.1. Locations inspected during the course of the Energy Audit

Date	Location of Energy Audit Testing
01-03-2020	Admin Block
	Faculty rooms
	Power House
	Classrooms
	Seminar Halls and Board rooms
	Auditorium
	Laboratories
	Computer Labs
	Well, Sump and pumps
	Sewage and Water Treatment Plant
	Library
	Hostels

The sections carry out monitoring, verification, and analysis of the given services with regard to the many aspects of energy use. Lighting systems provide the primary source of electrical energy consumption in each of these locations. The NPCL is the company that is responsible for providing the three phase power service connections that are found on the campus. Audits and studies are done on the usage of electricity charges to see whether or not they meet the requirements for load demand and efficient energy use.

Interactions with stakeholders have taken place, and opportunities for improvement have been highlighted. The spectrum of potential areas in which there are chances for energy conservation and savings has been identified, and implementation strategies have been provided for those areas.

10.2. Energy Audited Systems

1. Physically inspected lighting fixtures.

2. Energy-efficient lighting was installed.

3. Safety systems were tested.

4. Generator and UPS maintenance and consumption were confirmed.

5. NPCL invoices evaluated electricity consumption.

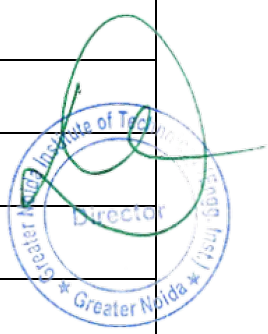
6. Stakeholder energy conservation understanding for optimal electricity consumption and savings was examined.

10.3. Consumption of Energy and Cost

The following graphic displays stakeholders' annual consumption of energy and cost.

Table 1: Month-wise energy consumption in KWh for the year 2020

Months	Energy consumption in KWh
Sept	88236.25
Oct	69124.25
Nov	58754.25
Dec	61025.75
Jan	38463.75
Feb	34290
Mar	39142



Apr	79526.25
May	128673.75
Jun	129108.75

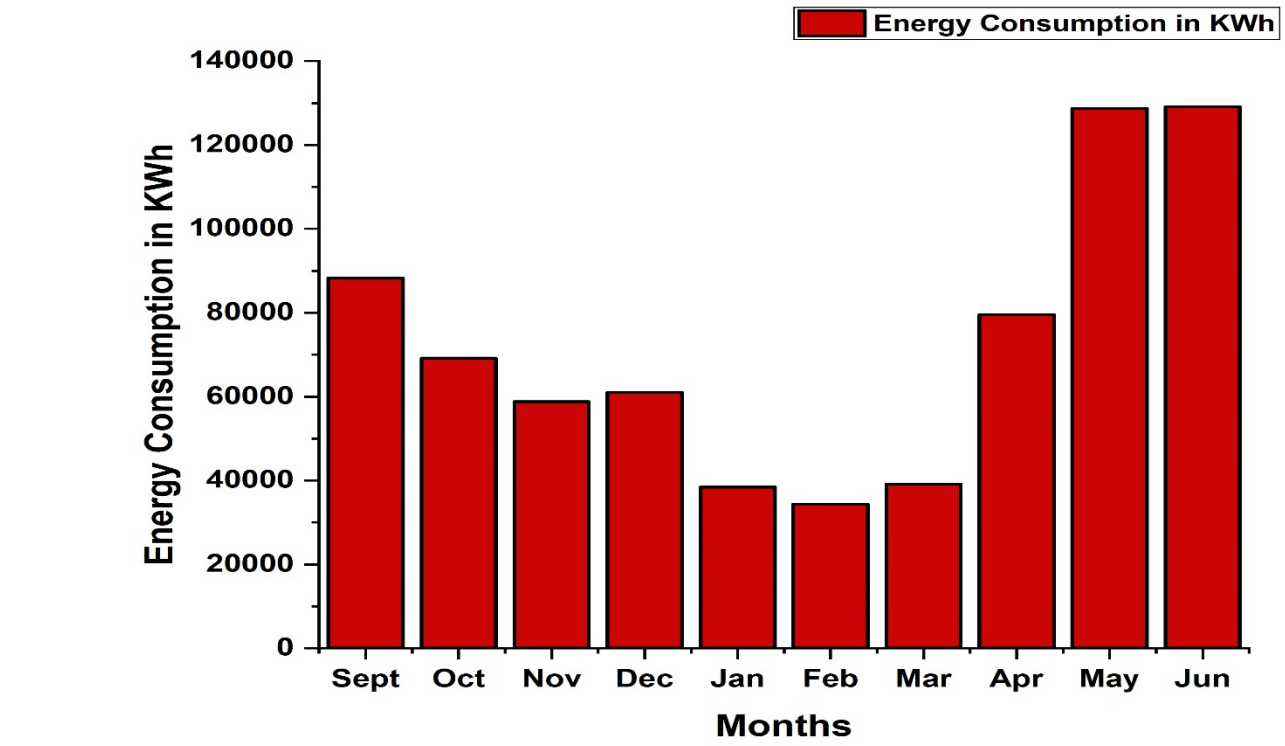
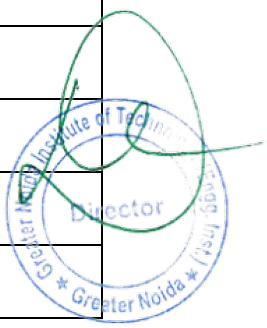


Fig. 1: Month-wise energy consumption in KWh for the year 2020

Table 2: Month-wise energy cost in INR for the year 2020

Months	**Energy cost in INR**
Sept	1214873
Oct	987545
Nov	754895
Dec	598425
Jan	544766
Feb	501305
Mar	523586



Apr	834124
May	1.39797E6
Jun	1.4143E6

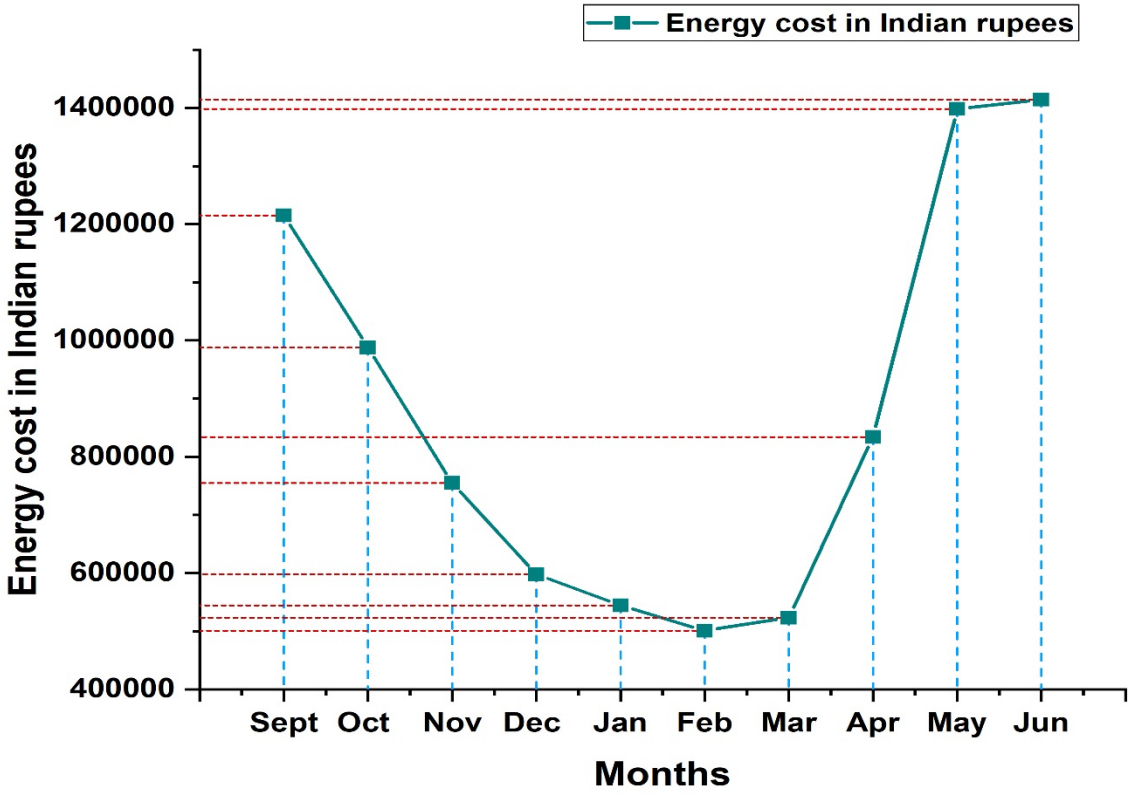


Fig. 2: Month-wise energy cost in INR for the year 2020

10.4. Energy supply Equipment and Major Loads

Contractual Load : 650 KVA

Transformer Rating: 1250 kVA

Generator Rating : 380 Kva

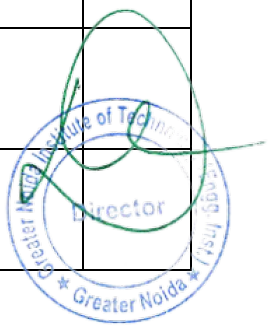
Table 3: Major electrical equipment

S.No	Equipment/ Components	Power Rating/ Capacity	Quantity
1.	Fan	60 W	1028
2.	LED Bulbs	18 W	400
3.	Tube Lights	18 W	1150
4.	Sodium Vapour Lights	11 W	57
5.	UPS	30 kVA	10
6.	Tubular battery 12V	12 V	100
7.	Projector	22 W	50
8.	Refrigerators	(2-5 star rated)	10
9.	AC (Split and Window)		220
10.	RO Water Systems		12

10.5 Different measurements

Table 4: Measurements Quantitative and Qualitative

S.No.	Audit checklist	Conformity		
		Yes	No	NA
1.	Has the organisation established energy audit procedures?	✓		
2.	Do campus energy efficiency and conservation programmes exist today?	✓		
3.	Energy savings: Management Representative, Electrical Engineer, Staff incharge?	✓		
4.	Have programmes to meet campus electricity usage bills for each building?	✓		
5.	Has the organisation guaranteed that environmental-specific staff have energy audit knowledge (e.g., education, training programme, seminar, workshop, camp, etc.)?	✓		
6.	Are energy audit goals and a register maintained?	✓		
7.	Any energy flow analysis for energy conservation must not negatively impact building output.	✓		
8.	Alternative energy efficiency metrics satisfying sophisticated investors' financial criteria	✓		



9.	Management's most efficient and cost-effective Energy Conservation Opportunities (ECOs) or Measures (ECMs).	✓		
10.	Are these energy efficiency and conservation factors adequately considered?			
	a. CFL/LED lights replace fluorescent tube, incandescent, and sodium vapour lights.	✓		
	b. Number of UPS and generators that provide power for power a backup to alternative current supply capacity in each building	✓		
	c. Number of solar energy systems, solar lights, solar water heaters and electric water heaters installed	✓		
	d. Automatic sprinkler systems that are used for irrigation	✓		
	e. Ultra-violet lights and other harmful lights used with safety precautions		✓	
	f. Reduce energy and carbon footprint.	✓		
11.	Is all monitoring electrical equipment properly calibrated?	✓		
12.	Is energy conservation equipment being retrofitted?	✓		
13.	Total campus electricity usage divided by population (kWh/person).	✓		
14.	Renewable energy production/annual energy usage			
15.	Total campus carbon footprint per person (metric tonnes).	✓		

10.6. Evaluation of the Facility's Capacity to Measure Carbon Dioxide

The quantity of carbon in the atmosphere of Earth is playing a significant part that acts as an international gauge for monitoring the pristine condition of the atmosphere despite the tremendous growth in climate change, environmental changes, and human populations including numerous commercial activities these days.

This is because the quantity of carbon in the atmosphere acts as a global indication for monitoring the purity of the environment. At a variety of locations all across the GNIOT campus, the concentration of carbon dioxide was determined with the assistance of a portable CO2 analyzer. According to the findings of the observation, the level of CO2 in the environment is found to be relatively low, and it has not yet reached the critical limit for CO2. It has also been discovered that all of the areas that were chosen have clean air, excellent air circulation, and are devoid of any contaminants.

Direct emissions, including those that arise from combustion of fossil fuels in production, being heated, and transport, as well as pollutants needed to generate electricity that is associated with the products and services consumed, are included in the carbon footprint, which is the amount of carbon dioxide produced associated with all of the actions of the institution or other organisations such as building constructing and activities that are caused by human beings. In addition to that, the concept of leaving a carbon footprint typically incorporated the emissions of many additional greenhouse gases.

Table 5: Examining the Levels of Carbon Dioxide in the Atmosphere at the GNIOT campus

S.No.	Different places of the campus	CO_2 level (in ppm)	Remarks
1.	1st year Class Room	352	CO_2 level is low
4.	Library	435	CO_2 level is low
5.	Computer Science Lab	413	CO_2 level is low
6.	Electrical Workshop	487	CO_2 level is low
7.	Admin Office	506	CO_2 level is low
8.	Conference Hall	497	CO_2 level is low
9.	Physics Lab	384	CO_2 level is low
12.	Parking Area	513	CO_2 level is low

Typical CO2 levels:

350–1000 ppm: In interior spaces with excellent air exchange and pure air

1000–2000 ppm: Sleepiness and poor condition of the air.

2000–5000 ppm: Critical level for headaches, tiredness, and stale, stuffy air. Poor concentration, attentiveness, heart rate, and minor nausea may occur.

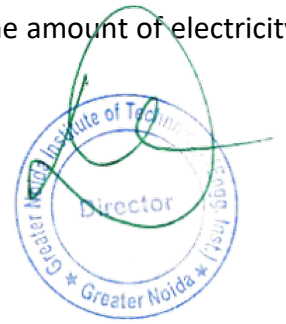
Calculation of GNIOT College's Carbon Footprint in Relation to Its Use of Electricity:

The calculation of one's carbon footprint can be performed based on the stage of computation that is described on the website www.carbonfootprint.com, involving the total amount of electricity that is consumed in one year.

The CO2 emission from electricity is equal to the annual electricity consumption measured in kWh/1000 multiplied by 0.84, which results in a total of 924.41 metric tonnes.

Notes:

The coefficient to use for converting kWh to metric tonnes is 0.84, and the amount of electricity used in a year is 1100498.8 kWh.



10.7 Methods for Lessening Our Carbon Footprint

Knowing one's carbon footprint is a first step towards reducing one's impact on the planet. There are many areas—transportation, food, clothing, waste—where even modest adjustments can have a significant impact over time. Follow these pointers:

Food

• Eat seasonal and locally grown foods.

• Cut back on red meat, especially beef.

• Choose fish caught in a responsible manner.

• Bring your own bags and skip the items wrapped in too much plastic.

• Make sure you only purchase what you will actually use to reduce waste.

Clothing

• Maintain your clothing well and consider borrowing, renting, or purchasing previously owned items.

• Clothing created ethically, such as from recycled materials or with an eco-label, should be a priority.

Transportation

• Ride a bike or take public transportation

• Drive safely and strategically

11. Organisational Best Practises

• Fences and warning signs safeguard transformers, generators, and UPS.

• Most places have "Switch ON" and "Switch OFF" signs to help stakeholders save energy.

• Staff and students are protected against damaged electrical cables, switch boxes, and stabilisers.

• Rooftop solar power plant.

• Solar water heaters work.

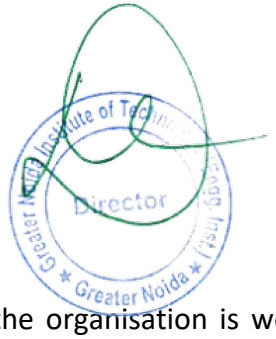
• LED and solar streetlights are used.

• Installed sensor-controlled switches.

• Auditoriums have HVLS fans.

• Water level controllers.

• Campus e-vehicles.



12. Conclusions

Energy conservation and campus self-sufficiency are possible since the organisation is well-established and has a solid reputation. Institutional energy conservation efforts are significant. The institution uses energy-efficient lighting, stakeholder awareness, and power backups. The organization's energy audits

best practises include fences and warning signs for transformers, generators, and UPS. Most places have "Switch ON" and "Switch OFF" signs to help stakeholders save energy. Staff and students are protected from damaged electrical cables, switch boxes, and stabilisers. Appreciated campus sprinkler watering energy savings. Few suggestions can boost the Organization's energy savings. This may lead to a bright future for Energy Efficiency Campus and sustainable community development for stakeholders in coming years.