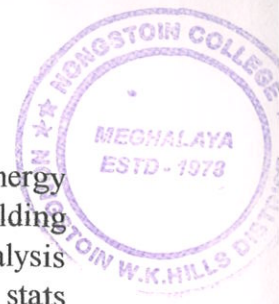




## **ENERGY AUDIT**

**NONGSTOIN COLLEGE**

**2024**



## ENERGY AUDIT

An energy audit is a process for energy inspection and analysis of energy flow for energy conservation in a building or industry, or to reduce the amount of energy into the building without affecting the output of the building. Energy audit is a process of testing and analysis energy uses the institutions and other organizations. National energy conservation laws state that the regulations for energy consumption, investigation and energy audit management. Energy audit includes the survey of all electrical devices which use energy in a building after a period of time. Energy audit includes the supply of energy, use of energy and energy losses for all normal buildings. Energy auditing is therefore, essential for any environmentally responsible institution which will contribute to conserve the environment and to enhance sustainable development.

The objective of the audit was to study the energy consumption pattern of the facility, identify the areas where potential for energy/cost saving exists and prepare proposals for energy/cost saving along with investment and payback periods.

## ENERGY USAGE

**Electricity charges** – Rs 12,000 per month (approx)

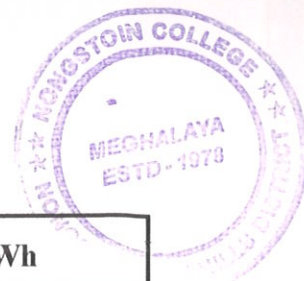
**Generator fuel (Diesel Generator Set)**–30 Litres per month

**Gas plan (Petrol)** – 40 Litres per month

## Check list of electrical electronically equipments in college

Sl. No.	Devices	No.
1.	Number of CFL bulbs	9
2.	Number of LED bulbs	27
3.	Tube lights	413
4.	Flood lights	13
5.	Computers	65
6.	Refrigerators	1
7.	Water pump	3
8.	Photocopier	4
9.	Printers	5
10.	LCD projector	15
11.	Television	2
12.	Number of inverters	1
13.	Number of water heaters	2
14.	Scanner	3
15.	CCTV DVR	2
16.	Electric kettle	4
17.	Smart Board	2
18.	Paper shredder	1

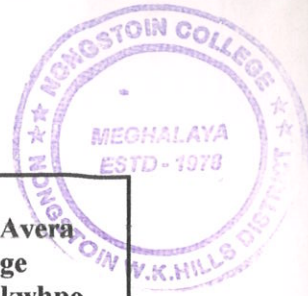
## Checklist of Laboratory Equipments



Sl. No.	Instrument	Number of appliances	kWh
1	Autoclave	1	1.5
2	Doubledistillation unit	2	7.5
3	Magnetic stirrer	4	0.6
4	Spectrophotometer	1	0.03
5	Weighing balance	4	0.1
6	Hot plate	3	1
7	Melting point apparatus	1	0.5
8	Hot air oven	2	2.2
9	Water bath	2	1
10	Centrifuge	4	0.18
11	Digital multi meter		
12	Ammeter		
13	Voltmeter		
14	Sodium Vapour Lamp		
15	Mercury Vapour Lamp		

There are many equipments mentioned in the above table where the kWh are not identified since the assembled equipment does not have any details regarding it. Moreover, while calculating total energy usage, the audit team was unable to measure its usage because of its rare usage by lab users.

## Electric Appliance Audit Sheet



Appliance	Power use (Watt)	Power in (kWh)	Usage per day (Hours)	Number of Units/ appliances	Average kwh per day (watt x hours x no/ 1000)	Average kwh per month
Number of CFL bulbs	15	0.015	6	9	0.810	17.82
Number of LED bulbs	10	0.01	6	27	1.620	35.64
Tube lights	40	0.04	6	413	99.12	2180.64
Flood lights	100	0.1	10	13	13	286
Computers	250	0.25	4	65	65	1430
Refrigerators	180	0.18	24	3	12.96	285.12
Water pump	1864.25	1.8	1	3	5.592	123.04
Photocopier	1000	1	4	4	16	352
Printers	25	0.025	4	5	0.5	11
LCD projector	240	0.24	3	15	10.8	237.6
Television	100	0.1	2	1	0.2	4.4
Inverters	3000	3	2	1	6	132
Water heaters	2000	2	2	1	4	88
CCTV DVR						
Electric kettle						
Smart Board						
Paper Shredder						
<b>TOTAL</b>						
Scanner	20	0.02	4	3	0.24	5.28

The total energy utilization of the college for different purposes is approximately **5242.44** kWh/ month. Electricity charges per month is Rs. **12,000/-** month (Approx).

Non-conventional category of energy like solar energy will be a good alternative for efficient energy management system for the college. Energy saving through the replacement of CFL lamps and tube lights to LED light could be a good option. Awareness programmes for the stakeholder to save energy may also increase sustainability in the utilization of various energy source.

Following are the major consumers of electricity in the facility:

- Computers
- Lighting
- Printers
- Xerox machines
- UPS
- LCD Projector
- Router system
- Pumping motor
- CCTV
- Other Lab Equipment



### Existing energy management methods in the campus:

- Electrical equipments are turned off when not in use
- Older and damaged equipments are replaced
- Wiring and electrical maintenance are periodically monitored and replacements are made.
- Use computers and electronic equipments in power saving mode.
- Raise awareness by encouraging staffs and students to help in monitoring energy consumption and implement corrective actions.

### Recommendations:

1. There has to be Institute level student community that keep track of the energy consumption Parameters of the various departments, classrooms, halls, areas, meters, etc
2. Energy auditing inside the campus has to be done on a regular basis and report should be made public to generate awareness.
3. College should take initiative to arrange seminars, lectures, paper presentation competition among students and staff for general awareness.

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