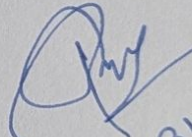


TO WHOM IT MY CONCERN

This is to certify that the Government General Degree College, Tehatta of Nadia District has conducted an 'Energy Audit' of the last academic session 2022-2023 to assess the electrical consumption, effective management of different electrical equipment and use of renewable energy resources. The activities and measures carried out by the college have been verified and were found to be satisfactory. The necessary feedback has been given and recommendations have been made to make energy consumption cost-effective and eco-friendly.

Name of the auditor: RAJARSHI BASU MALLICK

Designation: Executive Engineer,
PWD (Electrical)


31/05/24

Executive Engineer (P.W.D.)
Nadia Electrical Division
Krishnanagar, Nadia

(Signature of auditor with seal)



Government of West Bengal
Office of the Principal

Government General Degree College, Tehatta

Tehatta, Nadia, Pin-741160

E-mail: tehattagovtcollege@gmail.com

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Declaration

The energy audit conducted and prepared by our college are completely based on self-enquiry and data collected by the energy audit team. The perception about the audit was conducted by various electrical equipments used daily.

Signature of the members

1. Sumit Kumar Das
2. Susmita Chowdhury
3. Sanjoy Satpati
4. Ajoy Mandal
5. Pradyumn Das
6. Subrata Halder

Counter signed by

(Dr. Sibsankar Pal)
Officer-In-Charge

Government General Degree College, Tehatta



Dr. Sibsankar Pal
Officer-in-charge
Govt. Gen. Degree College, Tehatta
Nadia-741160



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ENERGY AUDIT REPORT (JULY 2022 - JUNE 2023)

Energy audit Team:

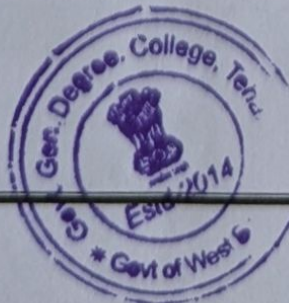
1. Dr. Sumit Kumar Das (Assistant Professor, Dept. of Physics)
2. Susmita Chowdhury (Assistant Professor, Dept. of Chemistry)
3. Dr. Sanjoy Satpati (Assistant Professor, Dept. of Chemistry)
4. Dr. Ajoy Mandal (Assistant Professor, Dept. of Physics)
5. Tridib Sinha (UDC)
6. Subrata Halder (DEO)


Preface:

The Energy Audit team of our college completed the energy audit survey. Every piece of information was gathered from every classroom, lab and area. The task is finished by taking into account the number of fans, tubes, ACs, electronic instruments etc. in each room and how much electricity these components consumed.

Objective:

- To improve the campus's energy competency.
- To reduce energy use while promoting or humanizing comfort, safety, and health.
- To identify the appliances that use the least amount of energy.
- Additionally, a number of daily procedures pertaining to typical equipment have been made available, which makes it easier to decrease energy expenditures
- To detect any loose connections or cable heating in a timely manner




Dr. Sibsanakar Pal
Officer-in-charge
Govt. Gen. Degree College, Tehatta
Nadia, 741160

Introduction:

Sustainability has emerged as a crucial aspect of institutional accountability in the ever changing world of today. The adoption of sustainable energy methods is deemed essential as Government General Degree College, Tehatta works to maintain its dedication to environmental stewardship and operational effectiveness. Following this ethos, the college conducted an energy audit to determine areas of inefficiency, evaluate its patterns of energy use, and prepare the ground for strategic improvements. In the present study the information was gathered from every classroom, lab, and area. The task is finished by taking into account the number of tubes, fans, air conditioners, electronic instruments, etc. in each room. Every time the energy audit is carried out it rekindles the interest in Energy Conservation as an important function. Energy Auditors sharing their experience and knowledge with the plant personnel, helps in fuelling the innovative ideas for further action of reduction in Specific Power consumption (SPC). Any loose connections or heating of cables come to timely vision. For an external competent authority due to unbiased vision, a few points for energy conservation may be visible each time they perform the audit. As an outcome of this audit our college has decided to take several initiatives which would help in achieving further energy conservations.

1. Electric connection

We have one meter in our college campus with following meter number.

WLD0799

1.1 List of Energy Consuming Sources: (Table Format) [Principal's Room, Principal Office and Department wise]:

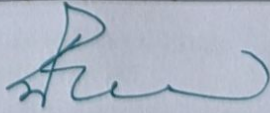
Dept./ Section/ Room	CCTV (No.)	Computer (No.)	Fan (No.)	Ex-Fan (No.)	Tube (No.)	LED tube/ Bulb (No.)	Printer/ Projector (No.)	Photo copier (No.)	AC (No.)	Fridge (No.)	Aqua guard & Cooler (No.)	Heater/ Micro wave (No.)	Vapor Lamp (No.)	Water Pump	Lab Instrument (No.)	Total Watt
Room 1 (Dept. of English)	1	0	9	0	8	0	0	0	0	0	0	0	0	0	0	955
Room 2 (Dept. of Philosophy)	1	0	9	0	8	0	0	0	0	0	0	0	0	0	0	955
Room 3	1	0	9	0	8	1	0	0	0	0	0	0	0	0	0	964



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(Dept. of History)																
Room 4	1	0	9	0	8	1	0	0	0	0	0	0	0	0	0	964
(Dept. of Physics)																
Room 5	1	0	9	0	8	1	1	0	0	0	0	0	0	0	0	1214
(Dept. of Bengali)																
Room 6	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	485
(Dept. of Pol Sci.)																
Room 7	1	0	9	0	11	0	0	0	0	0	0	0	0	0	0	1075
Room 8	1	0	9	0	11	0	0	0	0	0	0	0	0	0	0	1075
Room 9	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	705
Room 10	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	705
Room 11	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	705
Room 12	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	705
(Dept. of Chemistry)																
Room 13	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	485
Room 14	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	485
Room 15	1	0	9	0	11	0	0	0	0	0	0	0	0	0	0	1075
(Dept. of Mathematics)																
Library	1	2	15	0	20	0	1	0	0	0	0	0	0	0	0	2405
Chemistry Lab 1	1	0	9	0	8	0	0	0	0	1	0	0	0	0	0	1305
Chemistry Lab 2	1	0	9	0	8	1	0	0	0	1	0	0	0	0	5	2314
Chemistry Lab 3	1	0	9	0	8	0	0	0	0	0	0	0	0	0	5	1955
Math Lab	1	8	5	1	5	2	2	0	2	0	0	0	0	0	0	5423
Physics Lab 1 + Dark room	1	0	6+3	0	4+4	1	0	0	0	0	0	0	0	0	5	1964
Physics Lab 2	1	0	9	0	8	2	0	0	0	0	0	0	0	0	10	2973
Officer-In-Charge's Room	1	3	5	0	10	2	1	1	2	0	0	0	0	0	0	5373
Office	1	4	5	1	12	1	4	2	2	1	0	1	0	0	0	8344
Teacher's Room	1	8	16	0	34	2	8	0	4	1	1	0	0	0	0	12303
Ground Floor Corridor	2	0	9	0	4	0	0	0	0	0	1	0	0	0	0	1050
First Floor Corridor	3	0	4	0	11	0	0	0	0	0	1	0	0	0	0	985
Second Floor Corridor	2	0	7	0	8	0	0	0	0	0	0	0	0	0	0	820
Store Room	1	0	4	0	8	0	0	0	0	0	0	0	0	0	0	605

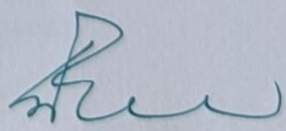



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Seminar Room	2	1	14	0	16	1	1	0	5	0	0	0	0	0	0	9539
Male Common Room	0	0	11	1	8	1	0	0	0	0	0	0	0	0	0	1249
Female Common Room	0	0	11	1	8	1	0	0	0	0	0	0	0	0	0	1249
College Canteen	0	0	5	1	10	0	0	0	0	1	0	0	0	0	0	1250
Security Room	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	330
Main Building Washrooms (4) (For Students)	0	0	0	4	16	8	0	0	0	0	0	0	0	0	0	1312
Teacher's Room washroom	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	380
Officer-In-Charge's Rooms' washroom	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	230
Office Washroom	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	230
College Campus	0	0	0	0	0	4	0	0	0	0	0	0	22	2	0	9536
Hostel Corridor (Ground + First)	0	0	0	0	10	7	0	0	0	0	0	0	0	1	0	2463
Hostel Kitchen	0	0	5	1	5	1	0	0	0	0	0	0	0	0	0	709
Hostel Warden Room	0	0	5	1	6	2	0	0	0	0	0	1	0	0	0	1358
Hostel Rooms (6 in total)	0	0	36	0	36	12	0	0	0	0	0	0	0	0	0	4068
Hostel Roof	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	250
Hostel washrooms (Ground + First)	0	0	0	4	4	4	0	0	0	0	0	0	0	0	0	796
Grand Total	35	26	313	19	396	55	18	3	15	5	3	2	23	3	25	95320

NOTE: 6 and 16 Amp plug points are omitted from the table as they are rarely used.

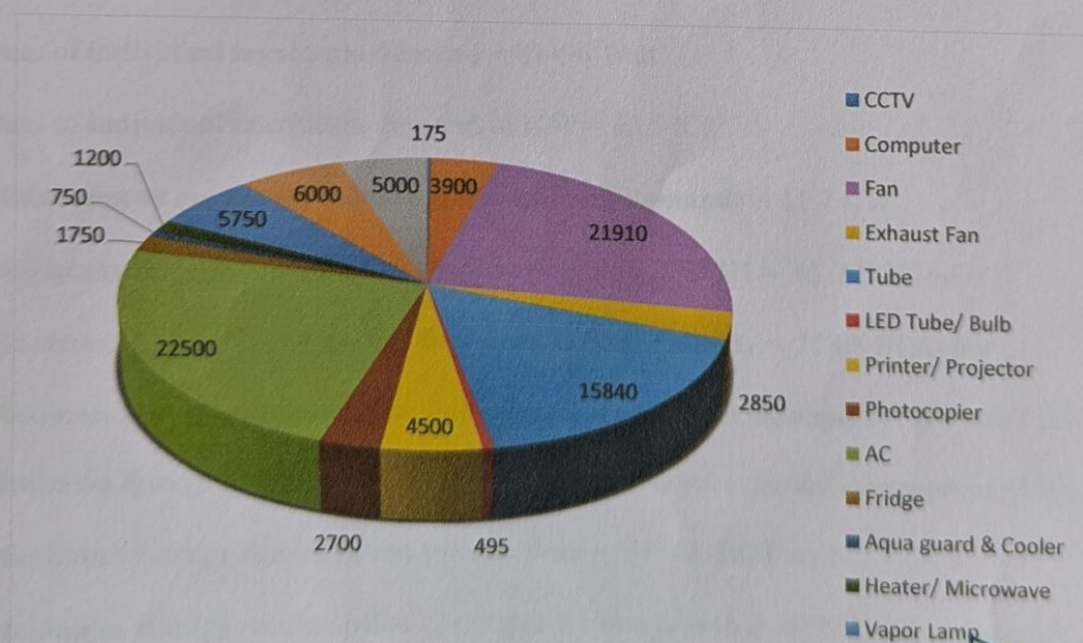


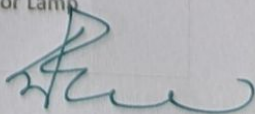

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1.2 DEVICE SPECIFIC LOAD CONSUMPTION:

Sl No.	Name of the appliance	No. of Items	Wattage
1.	CCTV	35	175
2.	Computer	26	3900
3.	Fan	313	21910
4.	Exhaust Fan	19	2850
5.	Tube	396	15840
6.	LED Tube/ Bulb	55	495
7.	Printer/ Projector	18	4500
8.	Photocopier	3	2700
9.	AC	15	22500
10.	Fridge	5	1750
11.	Aqua guard & Cooler	3	750
12.	Heater/ Microwave	2	1200
13.	Vapor Lamp	23	5750
14.	Water Pump	3	6000
15.	Lab Instrument	25	5000
	TOTAL	941	95320

Device Wise Load Distribution Pie Chart:



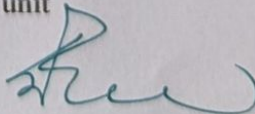

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1.3. Calculation of Electrical Load & Consumption: - (Table Format)
[Equipment item wise]:

SL. No.	Name of the Equipment	Total No. of Equipment	Wattage	Total Wattage	Demand Factor	Max. Demand (Watt)	Max. Demand (KW)
I.	CCTV	35	5 - 10	175	0.8	140	0.1
II.	Computer	26	150	3900	0.8	3120	3.1
III.	Fan	313	70 - 100	21910	0.85	18623	18.6
IV.	Exhaust fan	19	150 - 250	2850	0.85	2423	1.9
V.	Tube	396	40	15840	0.85	13464	13.5
VI.	LED tube/ Bulb	55	9 - 22	495	0.85	420	0.4
VII.	Printer/Projector	18	250-400	4500	0.8	3600	3.6
VIII.	Photocopier	3	900	2700	0.8	2160	2.2
IX.	AC	15	1500 -2000	22500	1	22500	22.5
X.	Fridge	5	350-800	1750	0.85	1488	1.5
XI.	Aqua Guard & Cooler	3	250 - 350	750	0.8	600	0.6
XII.	Heater/ Microwave	2	600 - 2000	1200	0.85	1020	1.0
XIII.	Vapor lamp	23	250	5750	0.85	4888	4.8
XIV.	Water Pump	3	2000-3000	6000	0.8	4800	4.8
XV.	Lab Instrument	25	200 - 2000	5000	0.85	4250	4.2

- ❖ Total Wattage = 95320 Watt
- ❖ Sum of individual maximum demand = 83496 Watt
- ❖ Sum of individual maximum demand in KW = 83.5 KW
- ❖ Simultaneous maximum demand (50% of Total Demand) = 41.7 KW
- ❖ Maximum Energy consumption one hour per day (KWH) = 41.7 BOT unit
- ❖ Maximum Energy consumption five hour per day (KWH) = 208.5 BOT unit
- ❖ Maximum Energy consumption for one year (taking 240 working days) = 50040 BOT unit
- ❖ Maximum Energy consumption for rest 125 days (taking 5% of normal consumption) = 1303 BOT unit
- ❖ Maximum Energy consumption for one Year = 51343 BOT unit
- ❖ Maximum Energy consumption (average) for one month = 4278 BOT unit




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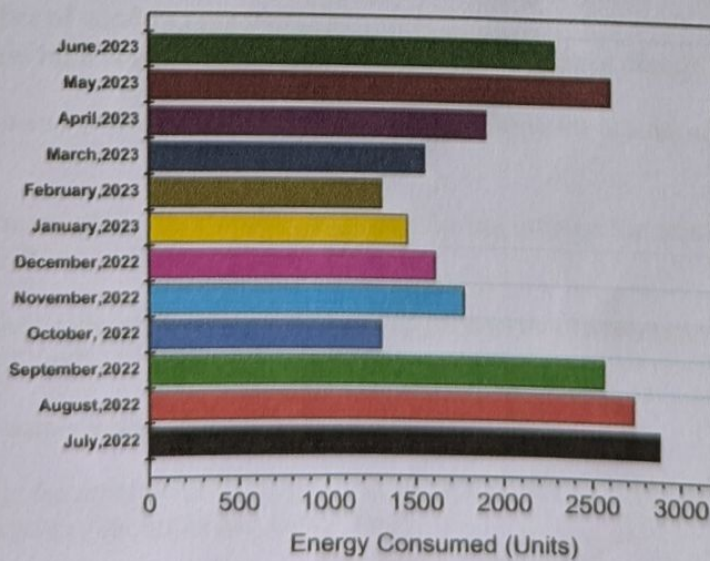
2. Consumption of Energy (units) in the period July, 2022 to June, 2023
(Table Format):

Month, Year	Energy consumed (in Units)
July,2022	2878.5
August,2022	2732
September,2022	2563.5
October, 2022	1304
November,2022	1769.5
December,2022	1607.5
January,2023	1450
February,2023	1307
March,2023	1548
April,2023	1896.5
May,2023	2597.5
June,2023	2282.5
TOTAL	23936.5

Yearly Total Energy units Consumed = 23936.5 BOT

Monthly (average) Energy units Consumed = 1994.7 BOT

Graph Showing the Units of Energy Consumed in 2022-2023:



(Handwritten Signature)

Dr. Sibsankar Pal
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Govt. Gen. Degree College, Tahata
Nadia-741160

3. Observation questionnaire:

3.1 Reduction of energy consumptions, especially fossil fuel energy:

3.1.1 Total electric consumption amount - 23936.5 KWH/Yr.

3.1.2 Average electrical consumption in a month- 1994.7 KWH.

3.1.3 Whether college has any provision/choice of renewable and carbon-neutral electricity options: "No"

3.1.4 Whether college has planned to install solar panels (if so, Project installed/working: Date/Month/Year): "Yes", college authority has initiated to take action on this.

3.1.5 Whether college has efficient water heating system: "No"

3.1.6 Whether the staff members of all sectors are concerned in turning off electrical appliances when not in use in both commercial and residential area: "yes"

3.1.7 Is there any monitoring system – like put off the main switch where there is no need of electricity? : "Yes"

3.1.8 Whether the users follow the appropriate and measurable targets for a reduction of energy, such as, computer, printers, electrical equipment when not in use: "Yes"

3.1.9 Is there any options for equipment's running on standby mode: "Yes"

3.1.10 Whether college has taken initiative to purchase efficient and environmentally sound appliances in order to fulfill the green budget: "Yes"

3.1.11 Whether college has its own mechanism in repairing of electrical fault: "Yes"

3.1.12 Whether the class rooms are with sufficient illumination in day time and ventilation: "Yes"

- Number of lights & fans in class room (average): 4+4
- Use of light & fans in the day time (average hours): 8 hrs
- Number of windows per class: 5
- Natural light source in day time (in hours) (average per class): 8 hours

3.1.13 How many (%) e-notice generated by the college for academic/administrative purposes in a month: 80%

3.1.14 How many (%) paper-notice generated by the college for academic/administrative purposes in a month: 20%

3.1.15 Whether college has organized lectures on energy conservation in order to give awareness to the students: "Yes"

3.2 Energy conservation strategies:

3.2.1 Whether the architectural design for college is based upon use of natural lighting & ventilation, to save extra power for bulbs and fans: "Yes"



A handwritten signature in blue ink, appearing to read "Sankar".

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Officer-in-charge
Govt. Gen. Degree College, Tehatta
Nadia-741160

3.2.2 Whether fluorescent bulbs are replaced with CFL bulbs/LEDs: "Yes"

3.3 Minimize the use of unsustainable transport:

3.3.1 What are the available/maximum transport facilities used by the staff members/students etc., - mention the number (in average per day): E-rickshaw – 20 in number, Bi-cycle- 30 I number.

3.3.2 Whether college has any common car sharing/car pool among the students and faculty: "No"

Observation:

Our college's primary energy source is electricity. In addition, as an alternative source of energy, we want to put solar panels on the roof of our college building. Our college will be installing more LED lights in order to save electricity. Computers are powered down when not in use. Computers run in power saving mode. Unnecessary consumption of power is not allowed and all the switches are carefully operated.

Conclusion

Energy audit is an effective tool in identifying and pursuing a comprehensive energy management program. A careful audit of any type will give the organization a plan with which it can effectively manage the energy consumption at minimum cost. Through this study suggestions / recommendations has been made to reduce the electrical power consumption.

Signature of Energy Audit Committee:

- | Name | |
|------------------------|--------------------------|
| 1. Dr. Sumit Kumar Das | <i>Sumit Kumar Das</i> |
| 2. Susmita Chowdhury | <i>Susmita Chowdhury</i> |
| 3. Dr. Sanjoy Satpati | <i>Sanjoy Satpati</i> |
| 4. Dr. Ajoy Mandal | <i>Ajoy Mandal</i> |
| 5. Tridib Sinha | <i>Tridib Sinha</i> |
| 6. Subrata Halder | <i>Subrata Halder</i> |

[Signature]
31/05/24
(Dr. Sibsankar Pal)
Officer-In-Charge
Government General Degree College, Tehatta

Dr. Sibsankar Pal
Officer-in-charge
Govt. Gen. Degree College, Tehatta
Nadia-741160



THE ENERGY AUDIT REPORT IS CERTIFIED BY:

[Signature]
31/05/24
Junior Engineer, P.W. Dte.
Krishnagar Electrical Section - V
Govt. of West Bengal

[Signature]
31/05/24
Executive Engineer (P.W.D.)
Nadia Electrical Division
Krishnagar, Nadia