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DARJEELING GOVERNMENT COLLEGE
DARJEELING

ENERGY AUDIT REPORT

Lebong-Cart Road
Darjeeling
734101

Coordinator
IQAC
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Darjeeling Government College, established on August 5, 1948, has been a cornerstone of higher education in the eastern sub-Himalayan region. Located at an altitude of 2134 meters on the Lebong Cart Road, the college is adjacent to key landmarks such as the Padmaja Naidu Himalayan Zoological Park and the Himalayan Mountaineering Institute. With a rich heritage, the college has evolved into a premier institution, providing quality education and fostering holistic development for its students.

As a fully government-run institution, Darjeeling Government College operates under the administrative control of the Higher Education Department of the Government of West Bengal. The college is dedicated to maintaining high academic standards, as evidenced by its faculty appointments through the West Bengal Education Service (W.B.E.S.) and West Bengal Senior Education Service (W.B.S.E.S.), based on the University Grants Commission (UGC) guidelines.

The college hosts an Indira Gandhi National Open University (IGNOU) study centre, a well-stocked Central Library with over 100,000 books, and offers modern technological facilities including internet and Wi-Fi access. It prioritizes student welfare with various amenities such as affordable stores, canteens, and hostels, alongside a comprehensive fitness center. Additionally, the institution emphasizes extracurricular engagement through cultural programs, sports, and robust National Cadet Corps (N.C.C.) and National Service Scheme (N.S.S.) units.

With a focus on continuous improvement, Darjeeling Government College actively organizes national and international seminars, encourages research projects, and plans to introduce new undergraduate subjects. As it prepares for the 2nd cycle NAAC visit, the college remains committed to furthering student welfare and academic excellence.

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Memo No: N-12/22 Date: 04.03.2022

The following teachers are the member of Energy Audit Assessment Team (Internal)

Sl.No.	Name	Designation	Department	
1.	Shri. Sailesh Kumar Gupta	Assistant Professor	Physics	coordinator
2.	Shri. Sourav Basu Neogi	Assistant Professor	Chemistry	Member
3.	Dr. Ekramul Kabir	Assistant Professor	Physics	Member
4.	Shri. Partha Bhore	Assistant Professor	Bengali	Member
5.	Shri. Safin Pramanik	Assistant Professor	Philosophy	Member

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4/3/2022
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LIST OF FIGURES

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1. Introduction to Energy Audit

An energy audit is an essential tool for assessing how energy is utilized within a plant or institution, pinpointing waste, and identifying opportunities for improvement. With an overall energy efficiency from generation to final consumer of approximately 50%, saving one unit of energy at the end-user level is equivalent to saving two units at the power generation level. This underscores the critical importance of energy conservation.

Energy audits offer a systematic approach to evaluating energy management practices, uncovering inefficiencies, and formulating solutions. They are integral to the responsible utilization of economic, financial, social, and natural resources. By conducting an energy audit, institutions can enhance their management strategies by identifying and evaluating their energy systems comprehensively.

2. Objectives of Energy Auditing

The primary objectives of an energy audit include:

- **Identifying Energy Inputs:** Evaluating the quality and cost of various energy inputs.
- **Assessing Consumption Patterns:** Analyzing current energy consumption across different operational areas.
- **Relating Inputs to Outputs:** Correlating energy inputs with production outputs to gauge efficiency.
- **Spotting Energy Savings:** Identifying potential areas for thermal and electrical energy conservation.
- **Highlighting Waste:** Identifying major areas of energy wastage.
- **Setting Targets:** Establishing energy-saving targets for individual cost centers.
- **Implementing Conservation Measures:** Executing measures to conserve energy and achieve savings.

3. Methodology

The energy audit process involves a comprehensive approach, utilizing the following methodologies:

- **Site Inspections:** Conducting on-site visits to evaluate the condition and efficiency of existing systems, equipment, and building structures.
- **Staff Interviews:** Engaging with relevant officials to identify key focus areas and related systems.

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- **Measurements and Monitoring:** Using appropriate instruments for continuous or time-lapse recording and visual observations to identify energy usage patterns and losses.
- **Trend Analysis:** Analyzing trends in energy costs and consumption over time.
- **Efficiency Tests:** Performing capacity and efficiency tests on major utility equipment where applicable.
- **Loss Estimation:** Estimating various energy losses throughout the system.
- **Data Analysis:** Conducting in-depth analysis of collected data using computerized techniques to draw conclusions and develop energy conservation plans aimed at reducing specific energy consumption.
- This structured and detailed approach ensures a thorough evaluation of energy usage, paving the way for significant improvements in energy efficiency and conservation.

4. Present Energy Scenario:

Darjeeling Government College in Darjeeling relies on electricity purchased from the West Bengal State Electricity Distribution Company Limited (WBSEDCL) under the Tariff Category Commercial Urban A (CM_U). The college has a total sanctioned load of 124.7 kW and incurred a total billing amount of approximately **INR 6,13,384**/- for the four-quarter analysis period of 2022-23. The overall average energy charge was **Rs. 9.14 per unit**.

4.1 POWER SUPPLY SYSTEM

The power supply for the college is from WBSEDCL with the help of 430 Volts feeders under Commercial Urban A(CM_U) with sanctioned load 124.7 kW.

Phase	Red	Yellow	Green
Voltage (V)	240	240	240

4.2 DG Set:

The power house contains a DG set and the details of it provided in Table 1.

Table 1: Technical Specifications for DG set

Sr. No.	Parameter	Technical Specification DG
1	Make	Jackson Limited (Model no: JSPF-62.5)
2	Capacity	62.5 kVA
3	Rated Voltage	430 V
4	Frequency	50 Hz
5	Power Factor	0.95
6	Phase	3 Phase

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Figure 1(a). The DG set

Figure 1(b). Model display of DG set

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5.Observation:

5.1 Single Line Diagram:

This figure represents the single-line diagram of Darjeeling Government College in Darjeeling.

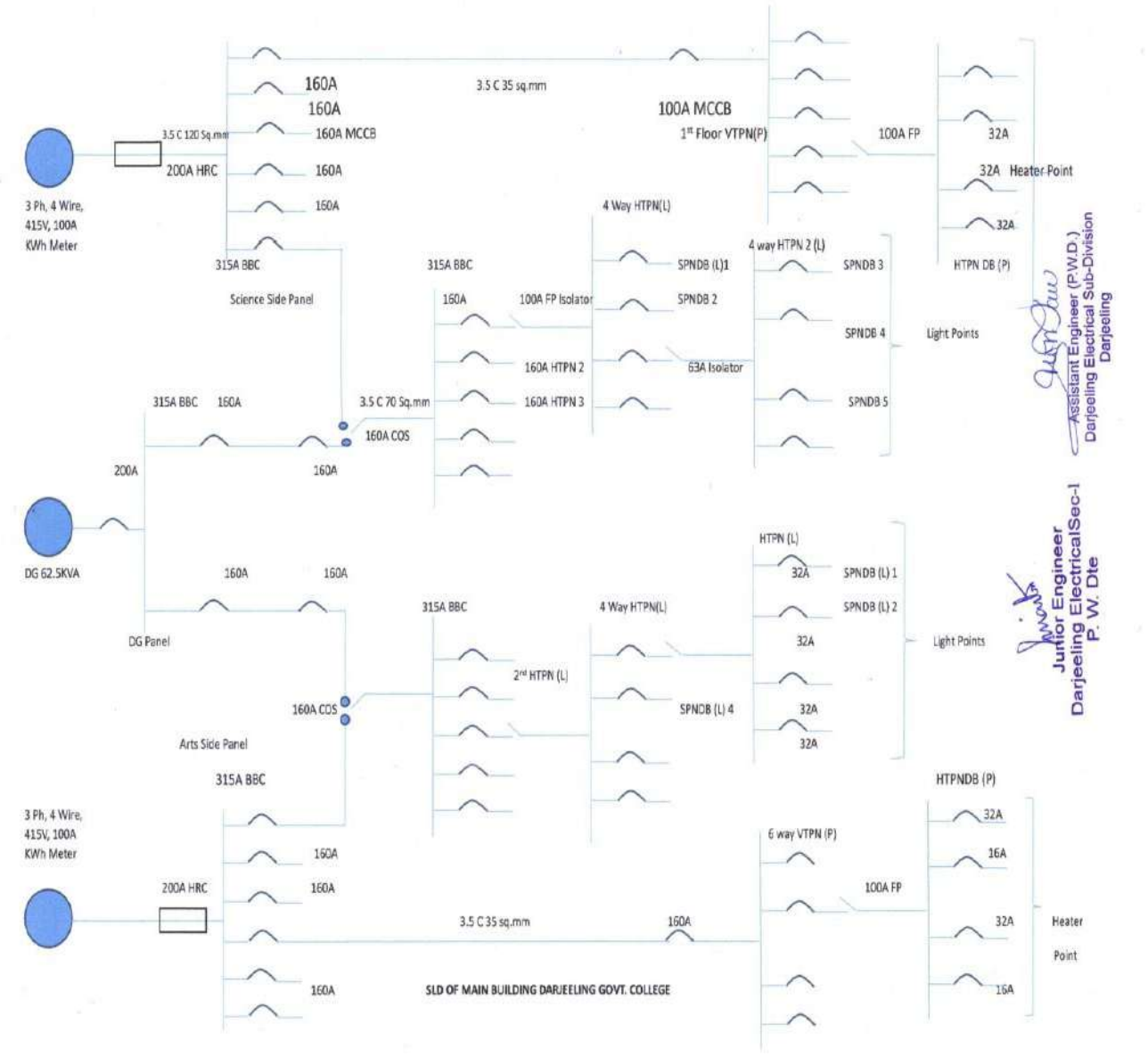

Figure 2. Single Line Diagram

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5.2 Electricity Bill Analysis:

The energy audit team analyzed the electricity bills of the College for the last four quarters. The detailed findings include the total unit consumption, the annual payable amount, and the annual per unit charges as follows:

Quarterly electrical energy consumption (Year – 2022-23):

The quarterly electrical consumption for the college is given in the Table 2

Table 2: Energy consumption of **college** and billing amount (year 2022-2023)

Sr. No.	Month & Year	Total Consumed Unit (KVAH)	Amount (Rs.)
1	Q1 (April-June)	11,376	110,343
2	Q2 (July-September)	10,838	102,077
3	Q3 (October-December)	8,764	84,171
4	Q4 (January-March)	10,733	102,058
	Total	41,711	398,649

Table 3: Energy consumption of **hostel** and billing amount (year 2022-2023)

Sr. No.	Month & Year	Total Consumed Unit (KVAH)	Amount (Rs.)
1	Q1 (April-June)	1,207	10,729
2	Q2 (July-September)	1,394	14,997
3	Q3 (October-December)	2,387	22,258
4	Q4 (January-March)	2,407	22,082
	Total	7,395	70,066

Table 4: Energy consumption of **quarters** and billing amount (year 2022-2023)

Sr. No.	Month & Year	Total Consumed Unit(KVAH)	Amount (Rs.)
1	Q1 (April-June)	404	5181
2	Q2 (July-September)	395	2367
3	Q3 (October-December)	334	1861
4	Q4 (January-March)	369	2211
	Total	1,502	11,620

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Table 5: Total energy consumption and billing amount of **college, hostel** and **quarters (2022-2023)**

Sr. No.	Item	Total Consumed Unit (KVAH)	Amount (Rs.)
1	College	41,711	398,649
2	Hostel	7,395	70,066
3	Quarters	1,502	11,620
	Total	50,608	480,335

Table 6: Overall unit Charges of **college** (year 2022-2023)

Sr. No.	Month & Year	Per Unit Charges (Rs/KVAH)
1	Q1 (April-June)	9.70
2	Q2 (July-September)	9.42
3	Q3 (October-December)	9.60
4	Q4 (January-March)	9.50
	Average	9.55

Table 7: Overall unit Charges of **hostel** (year 2022-2023)

Sr. No.	Month & Year	Per Unit Charges (Rs/KVAH)
1	Q1 (April-June)	8.89
2	Q2 (July-September)	10.75
3	Q3 (October-December)	9.32
4	Q4 (January-March)	9.17
	Average	9.53

Table 8: Overall unit Charges of **quarters** (year 2022-2023)

Sr. No.	Month & Year	Per Unit Charges (Rs/KVAH)
1	Q1 (April-June)	12.82
2	Q2 (July-September)	5.99
3	Q3 (October-December)	5.57
4	Q4 (January-March)	5.99
	Average	7.59

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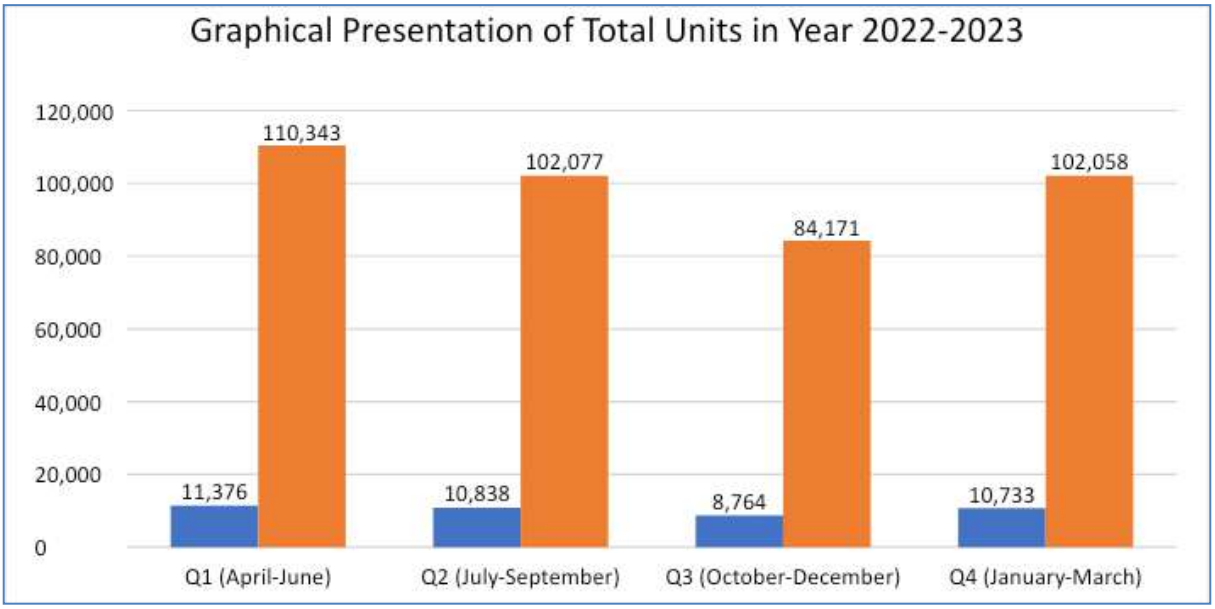

Figure 3. Graphical Presentation of Total Units of **college** (Year 2022-2023)

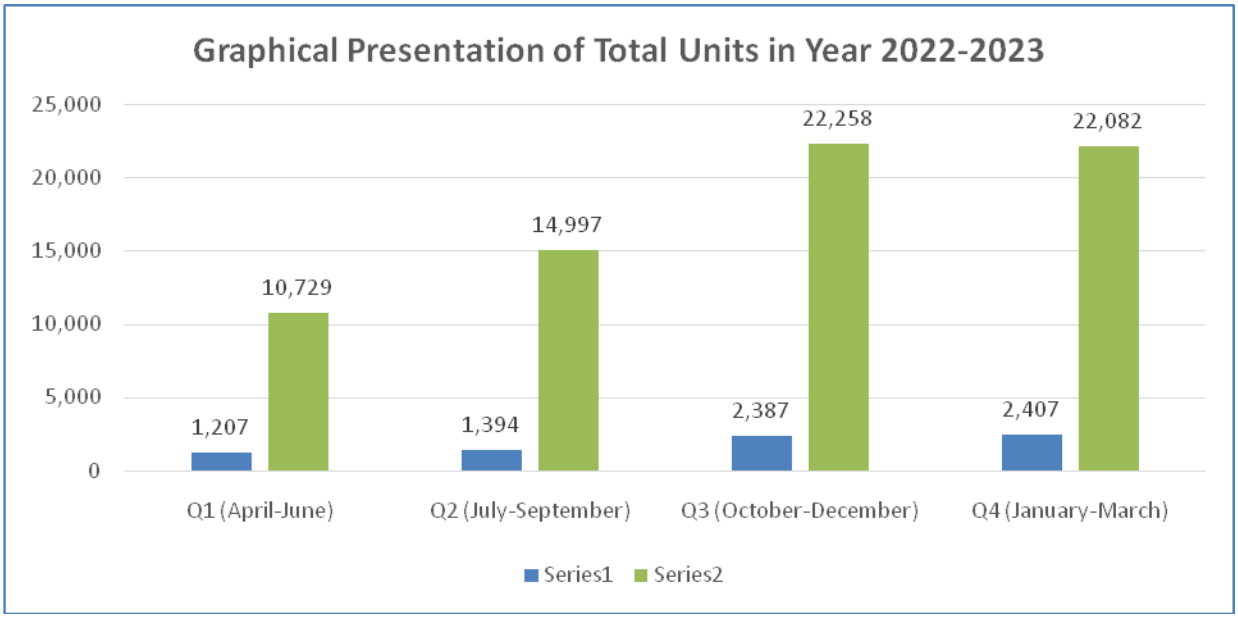

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Figure4. Graphical Presentation of Total Units of **hostel** (Year 2022-2023)

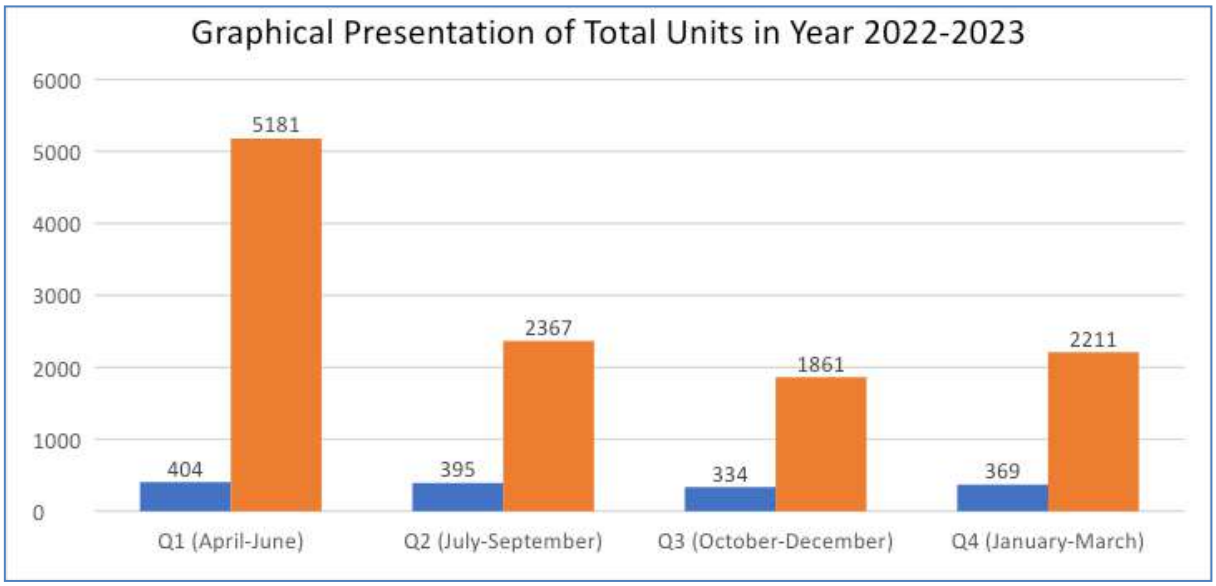

Figure 5. Graphical Presentation of Total Units of **quarters** (Year 2022-2023)

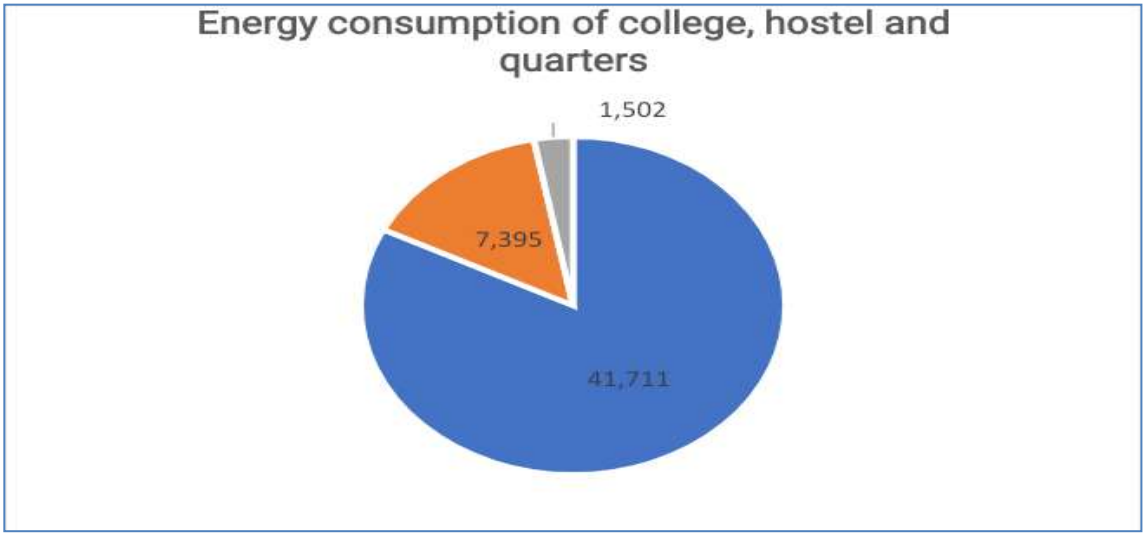

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Figure 6. Pi chart of energy consumption of **college, hostel and quarters** (year 2022-2023)

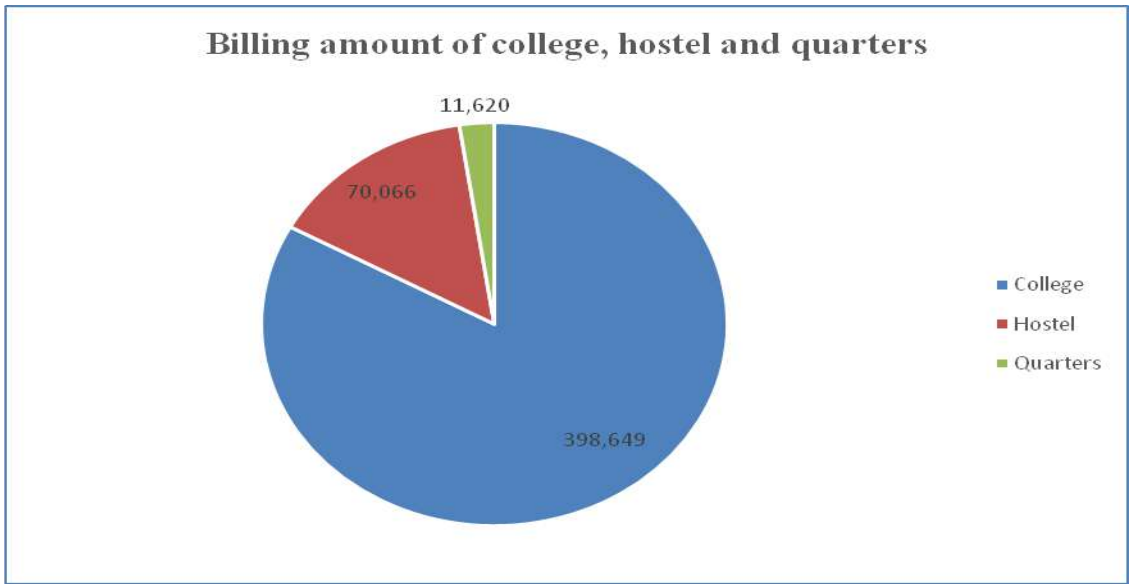

Figure 7. Pi chart of billing amount of **college, hostel and quarters** (year 2022-2023)

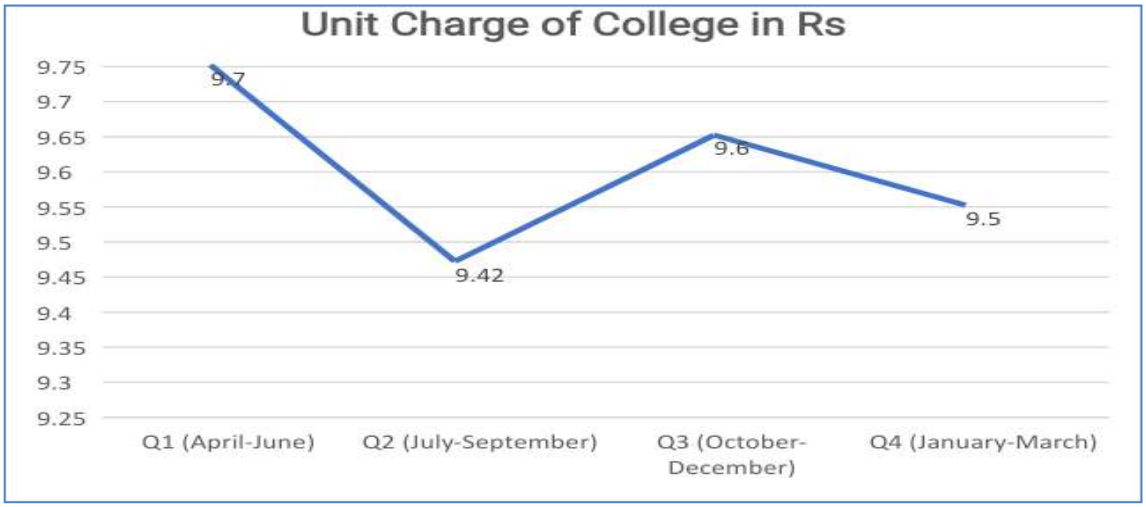

Figure 8. Graphical Presentation of actual per unit charges of **college** (Year 2022-2023)

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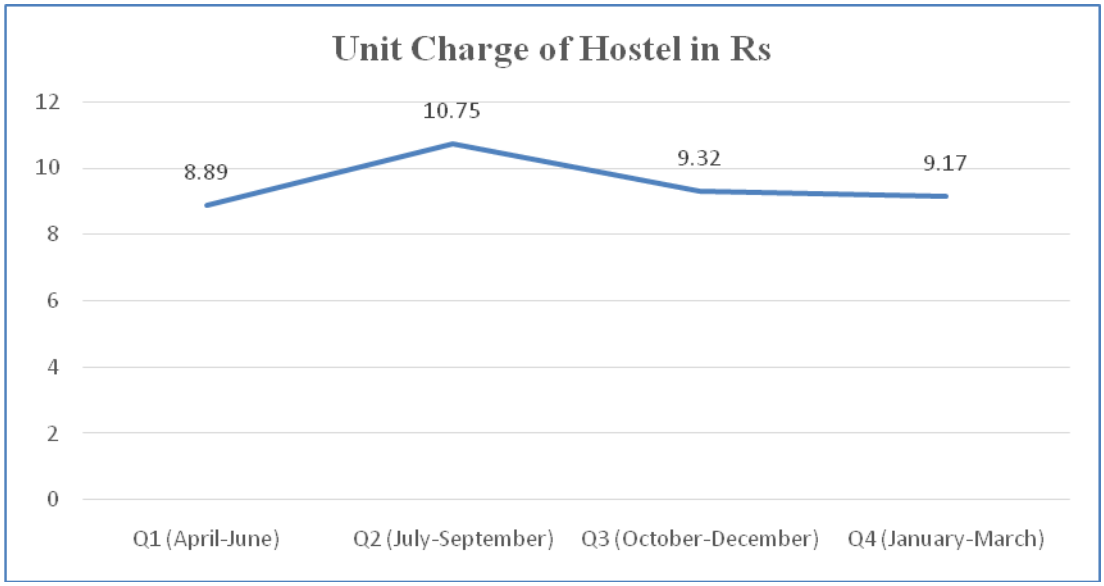

Figure 9. Graphical Presentation of actual per unit charges of **hostel** (Year 2022-2023)

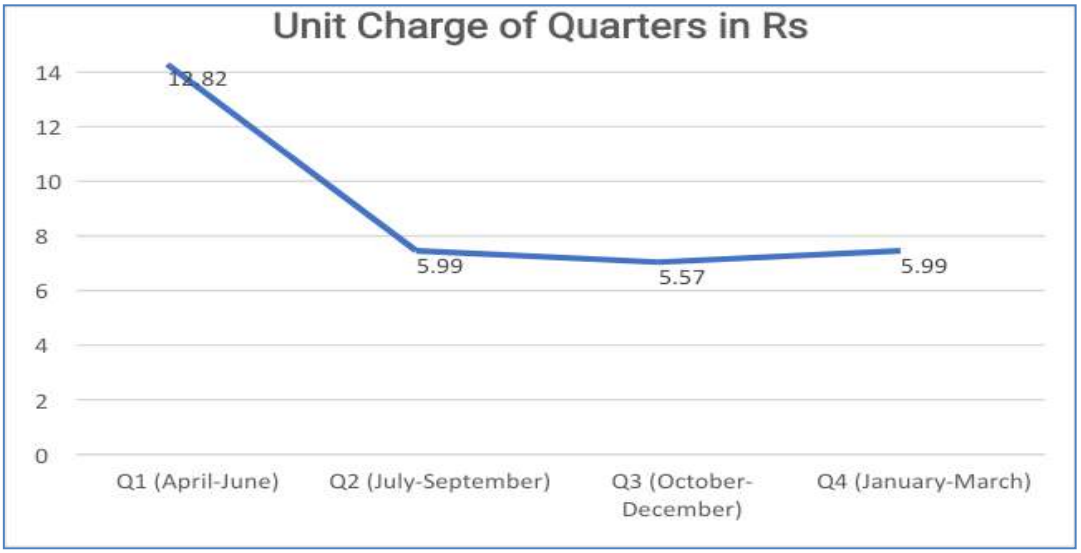

Fig 10: Graphical Presentation of actual per unit charges of **quarters** (Year 2022-2023)

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5.3 Connected Load of College:

Details of connected load are given in the Table 9

Table 9: Connected Load

Connected Load of College

Location/Department	Fixtures	Watt	QTY	TOTAL LOAD (WATT)
Department of Bengali	Computer	60	2	120
	Heater	1200	1	1200
	Printer	20	1	20
	Tube Light	18	2	36
Department of Botany	Autoclave	20	1	20
	Centrifuge	110	2	220
	Computer	60	5	300
	Heater	70	6	420
	Fridge	100	2	200
	Tube Light	40	45	1800
	Oven	1500	1	1500
	Printer	20	5	100
	CCTV Camera	40	2	80
Canteen	Heater	1200	2	2400
	LED Bulb	9	2	18
	Tube Light	18	4	72
	Exhaust Fan	60	1	60
Department of	Computer	60	1	60

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Chemistry	Exhaust Fan	60	5	300
	Heater	1200	3	3600
	Freezer	100	1	100
	Xerox	1000	1	1000
	Oven	2500	3	7500
	Printer	20	1	20
	Pump	1500	2	3000
	Tube Light	18	46	828
	Wi Fi	10	1	10
	Electric Kettle	1500	2	3000
	Micro Oven	1000	1	1000
Department of Nepali	Heater	1200	3	3600
	CCTV Camera	40	2	80
	Tube Light	18	28	324
	Computer	60	2	120
	Printer	20	2	40
Department of Economics	Computer	60	1	60
	Heater	1200	1	1200
	Printer	20	1	20
	Tube Light	18	3	54
Department of Hindi	Computer	60	2	120
	Heater	1200	3	3600
	Printer	20	2	40
	Tube Light	18	5	90

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	Electric Kettle	1500	1	1500
Department of English	Computer	60	1	60
	Heater	70	2	140
	Printer	20	1	20
	Tube Light	18	6	108
	LED Bulb	9	1	9
	Micro Oven	1000	1	1000
	Wi Fi	10	1	10
	Electric Kettle	1500	1	1500
Department of Geography	Computer	60	7	420
	Heater	1200	4	4800
	LED Bulb	18	5	90
	Printer	20	3	60
	CCTV Camera	40	2	80
	Tube Light	40	25	1000
	Filament Bulb	100	5	500
Department of History	Computer	60	2	120
	Heater	1200	2	2400
	Printer	100	2	200
	Tube Light	18	4	72
	Vacuum Cleaner	1000	1	1000
IGNOU	Computer	60	1	60
	Heater	1200	1	1200

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	Printer	20	1	20
	Tube Light	18	4	72
	Micro Oven	1500	1	1500
	Wi Fi	10	2	20
IQAC room	Computer	60	1	60
	Heater	1200	1	1200
	Printer	20	1	20
	Tube Light	40	4	160
	CCTV Camera	40	1	40
Library	Computer	60	2	120
	Heater	1200	1	1200
	Printer	20	2	40
	Dehumidifier	220	1	220
	Tube Light	18	33	594
	Electric Kettle	1500	1	1500
	Wi Fi	10	1	10
	CCTV camera	10	2	20
	LED Bulb	9	8	72
Department of Mathematics	Computer	60	1	60
	Heater	1200	1	1200
	Printer	20	1	20
	Tube Light	18	5	90
Office	Computer	60	7	420
	Heater	1200	5	6000

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	LED Bulb	18	6	108
	Printer	20	7	140
	Tube Light	18	10	180
Department of Philosophy	Computer	60	4	240
	Heater	1200	1	1200
	Printer	20	2	40
	Tube Light	18	3	54
Department of Physics	Computer	60	3	180
	Heater	1200	2	2400
	Fridge	100	1	100
	Printer	20	1	20
	Tube Light	18	46	828
	Filament Bulb	100	5	500
Department of Commerce	Computer	60	2	120
	Heater	1200	2	2400
	Printer	20	1	20
	Tube Light	18	5	90
Department of Political Science	Computer	60	1	60
	Heater	1200	1	1200
	Printer	20	1	20
	Tube Light	18	4	72
Principal's Chamber	CCTV Camera	40	4	160
	Computer	60	1	60
	Heater	1200	2	2400

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	Printer	20	3	60
	Tube Light	18	18	324
Department of Tibetan	Computer	60	1	60
	Heater	70	1	70
	Printer	20	1	20
	Tube Light	40	4	160
Street Light	Halogen light	90	7	630
Department of Microbiology	Computer	60	2	120
	Incubator	100	1	100
	Printer	20	2	40
	Tube Light	18	10	180
Satyendra Nath Tagore Civil Services	TV	100	1	100
	Inverter	200	1	200
	Computer	60	3	180
	Printer	20	1	20
	Tube Light	18	4	72
Department of Zoology	Autoclave	20	1	20
	centrifuge	110	1	110
	Computer	60	10	600
	CCTV Camera	40	3	120
	Heater	1200	12	14400
	Fridge	100	3	300
	Tube Light	40	96	3840
	Oven	2500	1	2500

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	Printer	20	11	220
	Pump	1500	1	1500
	Water Purifier	60	1	60
Classroom (top floor)	Tube light	18	50	900
	CCTV Camera	40	1	40
Corridor	Tube light	18	33	594
	CCTV Camera	40	5	200
Seminar Hall	LED panel	12	31	372
	Fan	50	4	200
	Large Speaker	100	4	400
	Small Speaker	15	2	30
	Projector	282	1	282
Hall (1st floor)	Tube light	40	30	1200
	Projector	282	1	282
Guard Room	Heater	1200	3	3600
	Tube light	18	1	18
Exam Cell	Tube light	18	2	36
Toilet	Tube light	18	9	172

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Connected Load of Hostel

Location/Department	Fixtures	Watt	QTY	TOTAL LOAD (WATT)
Castleton Hostel	Computer	60	0	0
	Electric Kettle	1500	2	3000
	Tube Light	18	18	324
	Rice Cooker	1000	1	1000
Heather Lodge	LED Bulb	9	27	243
	Tube Light	18	18	324
	Rice Cooker	1000	1	1000
	Inverter	200	1	200
	CCTV Camera with Monitor	40 100	16 1	640 100
	Electric Kettle	1500	18	27000
Snow-View Hostel	Heater	1200	2	2400
	CCTV Camera with Monitor	40 100	1 1	40 100
	Tube Light	18	20	360
	Electric Kettle	1500	13	19500
	Inverter	200	1	200
Annexure Girls Hostel	LED Bulb	9	18	0
	Exhaust Fan	60	2	120
	Heater	1200	1	1200
	CCTV Camera with Monitor	40 100	4 1	160 100
	Tube Light	18	13	234
	Electric Kettle	1500	13	19500

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Connected Load of Quarters

Location/Department	Fixtures	Watt	QTY	TOTAL LOAD (WATT)
Group C & D Quarter	TV	100	6	600
	Electric Kettle	1500	4	6000
	Tube Light	18	28	504
	Washing Machine	1000	6	6000
	Rice Cooker	1000	5	5000
New Professor Quarter	LED Bulb	9	60	540
	Tube Light	18	44	792
	Rice Cooker	1000	8	8000
	Halogen Light (Outside)	90	5	450
	Refrigerator	500	7	350
	Washing Machine	1000	7	7000
	Electric Kettle	1500	8	12000

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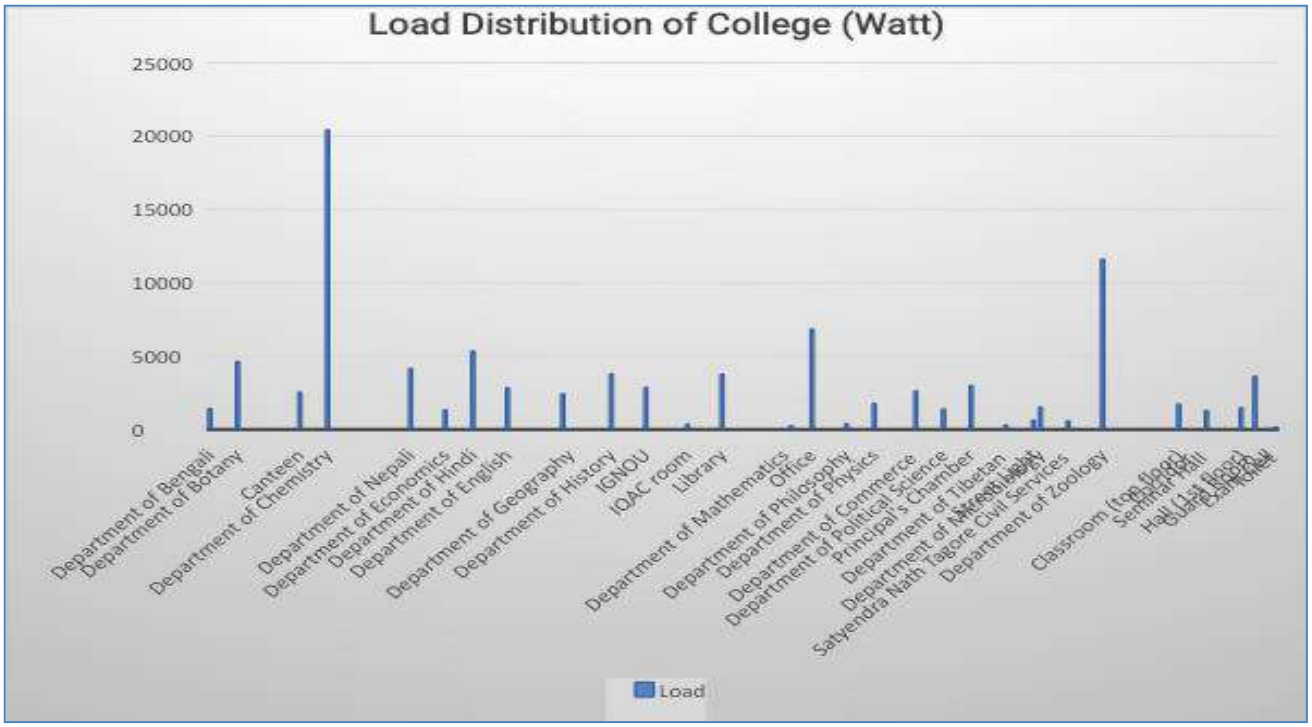

Figure 11. Load Distribution of **College** Location/Department wise (Watt)

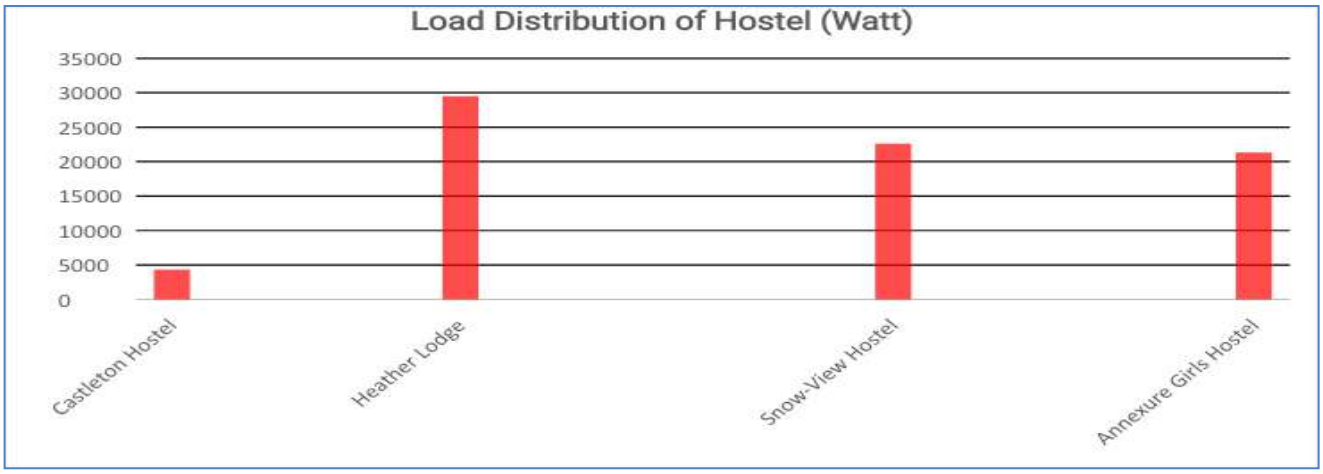

Figure 12. Load Distribution of **Hostel** Wise (Watt)

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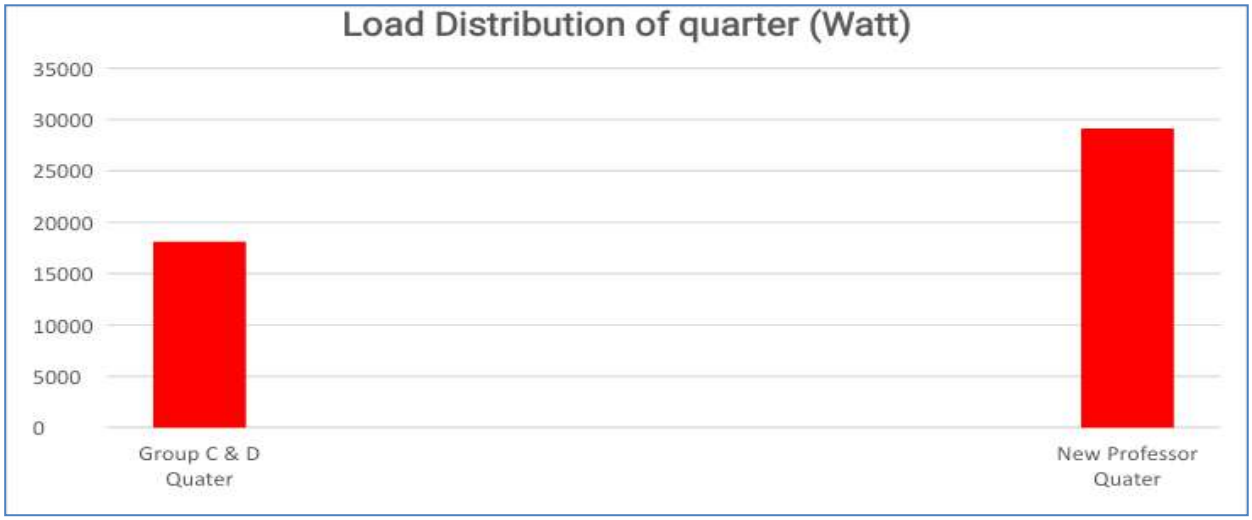

Figure 13. Load Distribution of **Quarter** wise (Watt)

Table 10: Connected load in Watt%:

Sr. No.	Fixtures	Watt %
1	Tube light	13.54
2	Autoclave	0.044
3	Centrifuge	0.36
4	Computer	3.84
5	Exhaust Fan	0.39
6	Heater	58.02
7	Fridge	0.77
8	CCTV Camera	0.70
9	Electric Kettle	4.96
10	Printer	2.16
11	Pump	4.28
12	Projector	0.94
13	Water Purifier	6.99

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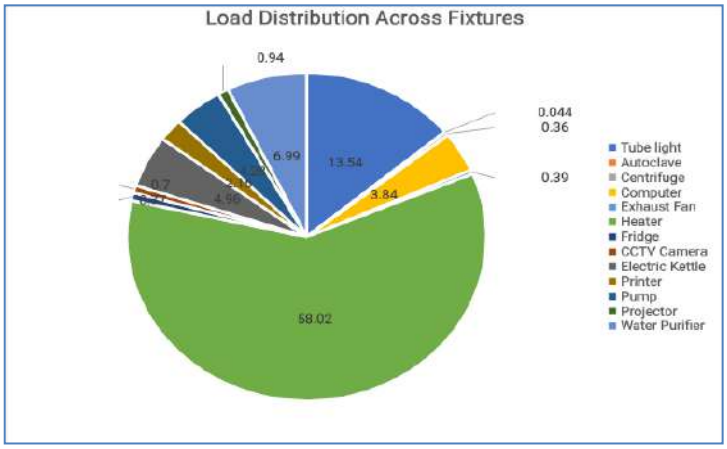
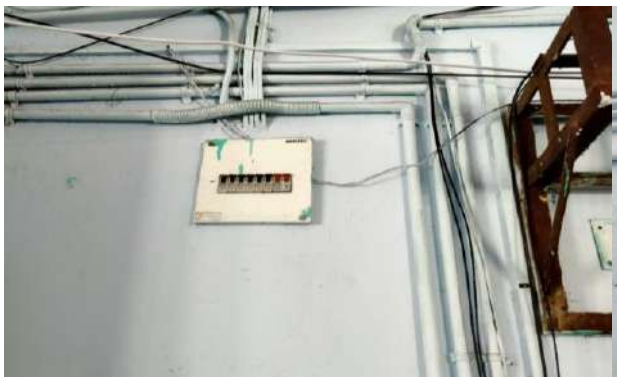
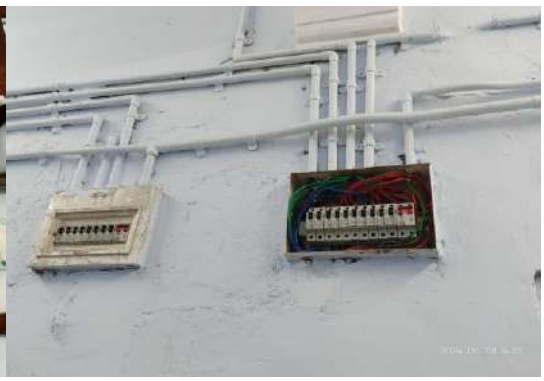


Figure14. Pi chart of load distribution across different fixture

Photograph of Hazard Area (Photo)





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Electrical Equipment (photo)

Autoclave

Centrifuge

Hot Air Oven

440V Main Electrical Service Panel

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6 .Findings:

Energy Consumption Analysis:

An analysis of the energy consumption data revealed the following key points:
Electricity is the sole source of energy, representing the entirety of the energy consumption.

Increased Heating Demand: Analysis reveals that the colder climate results in heightened demand for heating, amplified by inefficient building envelope characteristics such as poor insulation and air leakage, consequently escalating electricity consumption.

Artificial Lighting Reliance: Shorter daylight hours lead to augmented dependence on artificial lighting. Some buildings with inadequate natural light penetration due to inefficient envelope design exhibit higher electricity usage for lighting purposes. Some buildings have also old lighting fixtures and inefficient lamps.

Humidity Control Requirements: Damper climates necessitate humidity management through dehumidifiers or ventilation systems. Envelopes with moisture ingress issues exacerbate humidity control needs, increasing electricity consumption for dehumidification.

Envelope Performance Impact: The overall performance of the building envelope significantly influences energy usage. Poorly performing envelopes, characterized by inadequate insulation, air tightness issues, or thermal bridging, lead to increased energy losses and heightened electricity consumption for heating, cooling, and ventilation.

7. Recommendations:

Drawing from the insights gained through the energy audit, the subsequent recommendations are put forth to bolster energy efficiency and curtail operational costs:

- **Utilisation of Solar Energy:** Feasibility study towards installation of solar water heaters at suitable locations enabling hot/warm water supply to different sections, especially hostels, staff quarters, canteens and academic departments needs to be carried out to substantially reduce electricity consumption from utility grid (WBSEDCL).
- **Installation of Solar Photovoltaic Systems:** Feasibility study towards installation of Solar Photovoltaic (SPV) array with battery storage is recommended to be carried out to generate clean energy on campus and reduce reliance on the grid.
- **Enhance Building Envelope Efficiency:** Improve insulation, air sealing, and moisture control measures to minimize heat loss, air infiltration, and humidity-related energy consumption.
- **Optimize Lighting Design:** Utilize daylighting strategies, efficient lighting fixtures, and controls to maximize natural light utilization and reduce reliance on artificial lighting.

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Gradually replace all tube lights with LED lights to reduce energy consumption and improve electricity efficiency.

- **Replacement of Door Seals and Window Curtains:** Periodical replacement door seals to reduce air leakage and replacement of window curtains in some rooms is suggested to minimize heat loss and improve thermal comfort.
- **Educate Occupants on Energy Efficiency**: Provide students, faculties, and staffs with information and resources on energy-efficient practices, including temperature control, lighting usage, and appliance efficiency, to encourage behavior that reduces electricity consumption.
- **Conduct Regular Maintenance and Retrofits:** Implement a proactive maintenance program to ensure the continued performance of building envelope components and HVAC systems. Additionally, consider retrofitting existing buildings with energy-efficient technologies and materials to improve overall energy performance.

By implementing these recommendations, buildings in colder, darker, and damper climates in hilly regions can significantly reduce electricity consumption, enhance energy efficiency, and contribute to a more sustainable built environment.

8. Conclusion:

In conclusion, this energy audit report underscores numerous avenues for Darjeeling Government College to elevate energy efficiency, diminish energy usage, and realize cost savings. Embracing the suggested measures holds the promise of not only advancing environmental sustainability but also yielding long-term financial dividends for the institution. We urge Darjeeling Government College to accord priority to energy efficiency endeavors and contemplate formulating an action plan to address the recommendations delineated in this report.

Should further information or assistance be required for implementing the proposed strategies, we stand ready to offer our full support. Please feel free to reach out to us, as we are committed to aiding Darjeeling Government College in achieving its energy efficiency objectives.

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Endorsement signature of the Energy Audit members:

Endorsement signature of the Energy Audit members:

Sl No	Name & Designation	Signeture & Seal
1.	Shri Sailesh Kumar Gupta Assistant Professor Dept. of Physics Darjeeling Government College, Darjeeling	Sailesh Kumar Gupta Asst. Professor in Physics (W.B.E.S.) Darjeeling Govt. College
2.	Shri Sourav Basu Neogi Assistant Professor Dept. of Chemistry Darjeeling Government College, Darjeeling	Sourav Basu Neogi Assistant Prof. of Chemistry Darjeeling Govt. College Darjeeling- 734101 Govt. of West Bengal
3.	Dr. Ekramul Kabir Assistant Professor Dept. of Physics Darjeeling Government College, Darjeeling	Ekramul Kabir Asst. Professor in Physics (W.B.E.S.) Darjeeling Govt. College
4.	Shri Partha Bhore Assistant Professor Dept. of Bengali Darjeeling Government College, Darjeeling	Partha Bhore Dr. PARTHA BHORE Assistant Professor of Bengali, W.B.E.S. Darjeeling Govt. College Govt. of West Bengal
5.	Shri Safin Pramanik Assistant Professor Dept. of Philosophy Darjeeling Government College, Darjeeling	Safin Pramanik SAFIN PRAMANIK Assistant Professor (WBES) Department of Philosophy Darjeeling Govt. College Darjeeling

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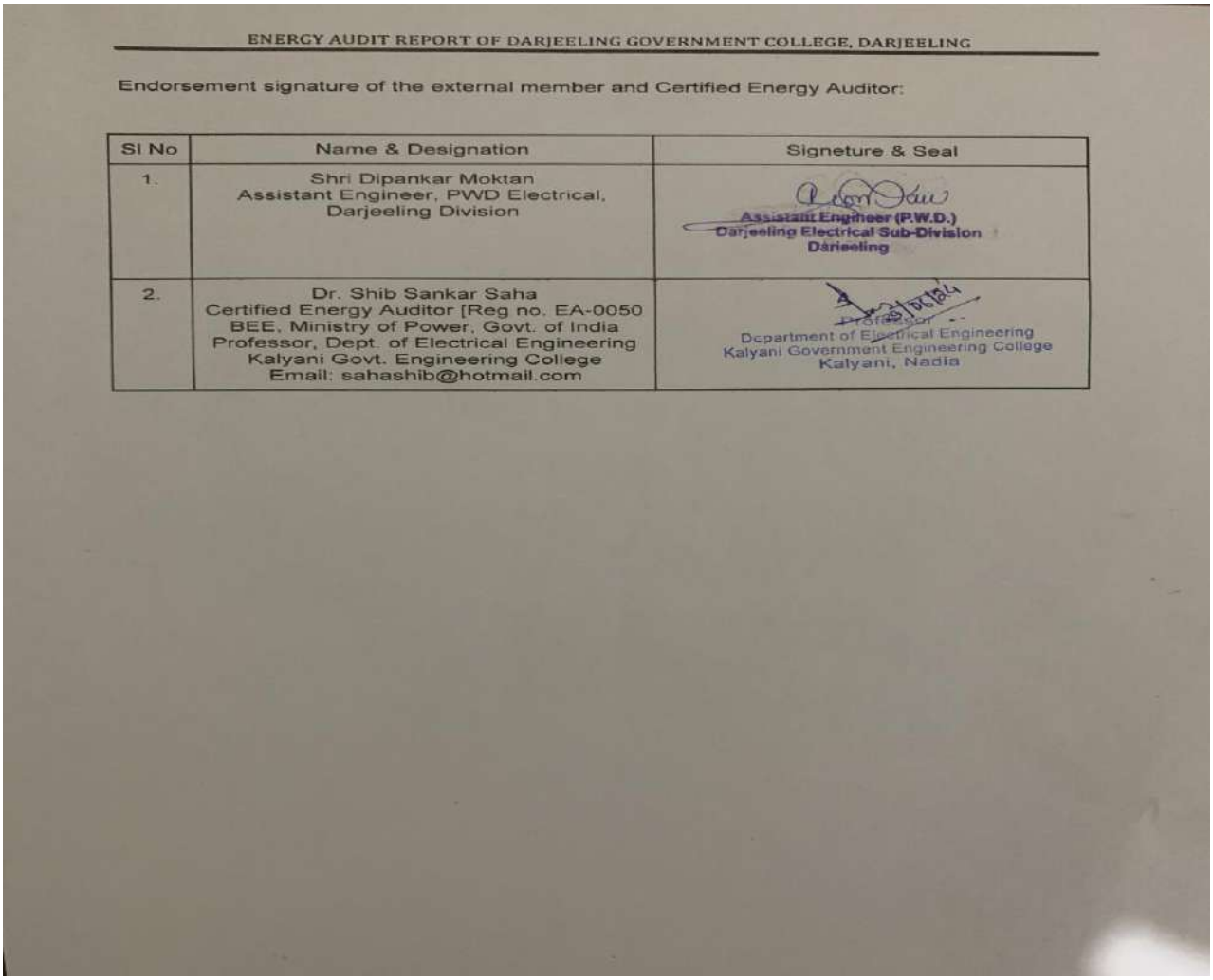
Endorsement signature of the external member and Certified Energy Auditor:



ENERGY AUDIT REPORT OF DARJEELING GOVERNMENT COLLEGE, DARJEELING

Endorsement signature of the external member and Certified Energy Auditor:

Sl No	Name & Designation	Signeture & Seal
1.	Shri Dipankar Moktan Assistant Engineer, PWD Electrical, Darjeeling Division	Assistant Engineer (P.W.D.) Darjeeling Electrical Sub-Division Darjeeling
2.	Dr. Shib Sankar Saha Certified Energy Auditor [Reg no. EA-0050 BEE, Ministry of Power, Govt. of India Professor, Dept. of Electrical Engineering Kalyani Govt. Engineering College Email: sahashib@hotmail.com	Professor Department of Electrical Engineering Kalyani Government Engineering College Kalyani, Nadia

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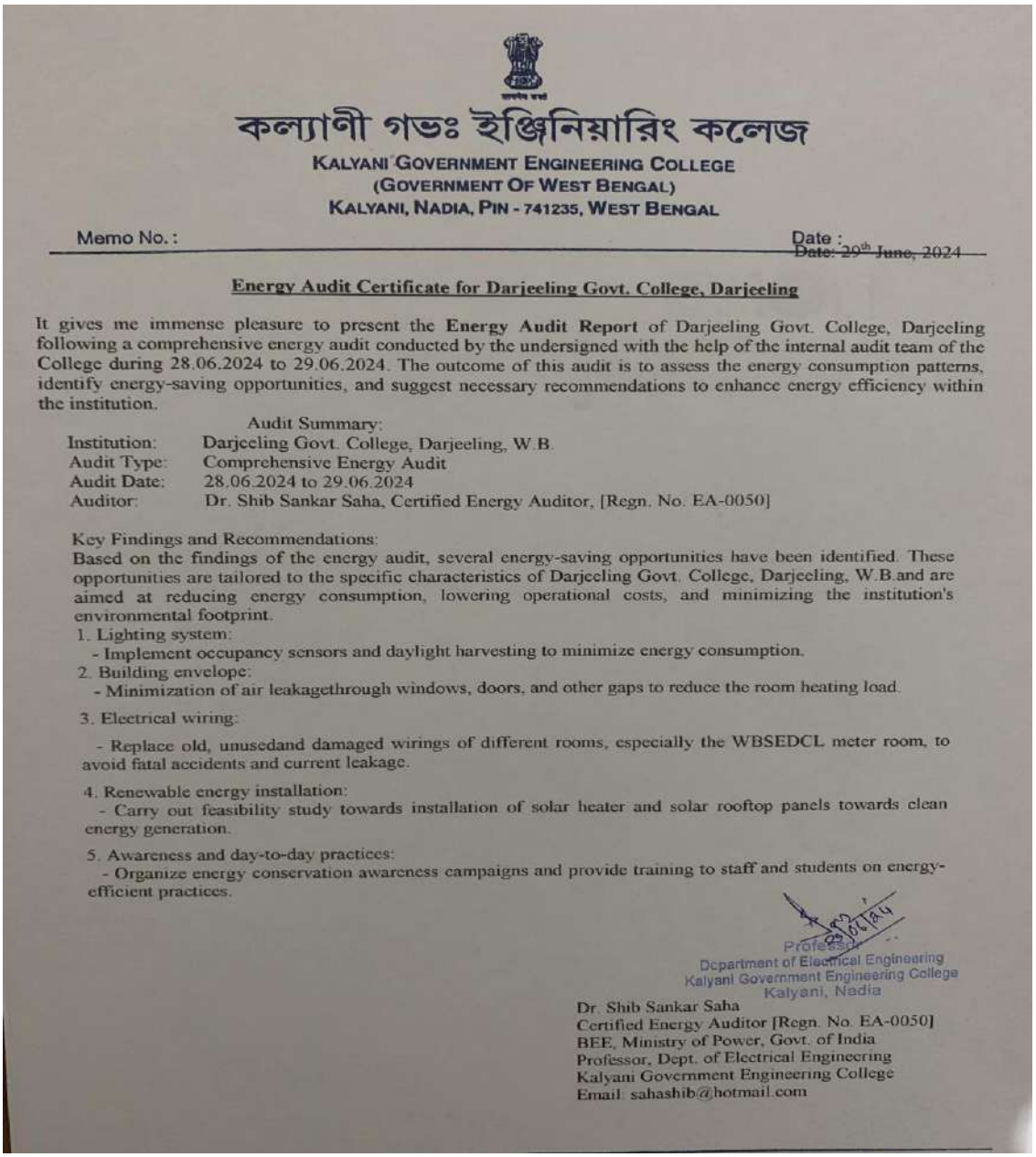
Energy Audit Certificate from Certified Energy Auditor



কল্যাণী গভঃ ইঞ্জিনিয়ারিং কলেজ

KALYANI GOVERNMENT ENGINEERING COLLEGE
(GOVERNMENT OF WEST BENGAL)
KALYANI, NADIA, PIN - 741235, WEST BENGAL

Memo No. : Date : ~~Date: 29th June, 2024~~

Energy Audit Certificate for Darjeeling Govt. College, Darjeeling

It gives me immense pleasure to present the **Energy Audit Report** of Darjeeling Govt. College, Darjeeling following a comprehensive energy audit conducted by the undersigned with the help of the internal audit team of the College during 28.06.2024 to 29.06.2024. The outcome of this audit is to assess the energy consumption patterns, identify energy-saving opportunities, and suggest necessary recommendations to enhance energy efficiency within the institution.

Audit Summary:

Institution:	Darjeeling Govt. College, Darjeeling, W.B.
Audit Type:	Comprehensive Energy Audit
Audit Date:	28.06.2024 to 29.06.2024
Auditor:	Dr. Shib Sankar Saha, Certified Energy Auditor, [Regn. No. EA-0050]

Key Findings and Recommendations:
Based on the findings of the energy audit, several energy-saving opportunities have been identified. These opportunities are tailored to the specific characteristics of Darjeeling Govt. College, Darjeeling, W.B.and are aimed at reducing energy consumption, lowering operational costs, and minimizing the institution's environmental footprint.

1. Lighting system:
   - Implement occupancy sensors and daylight harvesting to minimize energy consumption.
2. Building envelope:
   - Minimization of air leakagethrough windows, doors, and other gaps to reduce the room heating load.
3. Electrical wiring:
   - Replace old, unusedand damaged wirings of different rooms, especially the WBSEDCL meter room, to avoid fatal accidents and current leakage.
4. Renewable energy installation:
   - Carry out feasibility study towards installation of solar heater and solar rooftop panels towards clean energy generation.
5. Awareness and day-to-day practices:
   - Organize energy conservation awareness campaigns and provide training to staff and students on energy-efficient practices.

29/06/24
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Kalyani Government Engineering College
Kalyani, Nadia

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Certified Energy Auditor [Regn. No. EA-0050]
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Certificate of the certified Energy Auditor

Regn. No. EA-0050

No. 2031

National Productivity Council

(National Certifying Agency)

PROVISIONAL CERTIFICATE

This is to certify that Mr. / Ms. Shib Sankar Saha

son / daughter of Mr. Jadav Chandra Saha

has passed the National Certification Examination for Energy Auditors in 2006, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.

He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.

Place : Chennai, India

Date : 30th April 2007

Professor
Department of Electrical Engineering
Kalyani Government Engineering College
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Controller of Examination

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