ENERGY AUDIT REPORT 2025

Audit Period: January 2022 – March 2025

Prepared By: Energy Audit Committee, CAS Mavelikkara

Guided By: Principal Dr. Aysha V

IQAC Coordinator Smt. Latha Nair J

Academic Year: 2022-2025

College of Applied Science, Mavelikkara

(Affiliated to the University of Kerala)

Mavelikara P.O, Alappuzha-690101

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OVERVIEW OF THE COLLEGE

The College of Applied Science, Mavelikkara, was established under the Institute of Human Resources Development (IHRD) to provide higher education in the field of science and technology. Over the years, the college has developed into a center of excellence with modern infrastructure, qualified faculty, and dedicated student community. The institution offers undergraduate and postgraduate courses in Computer Science, Electronics, and related fields.

With a mission to impart quality education, CAS Mavelikara combines academic rigor with social responsibility. Over the years, the college has consistently strived to maintain high standards in teaching, research, and community engagement. In addition to academic pursuits, the institution has been actively engaged in promoting environmental consciousness, sustainable practices, and holistic student development in alignment with the vision of the National Assessment and Accreditation Council (NAAC). The campus is equipped with modern classrooms, laboratories, a well-stocked library, and ICT enabled facilities that provide

an enriching academic environment. At the same time, the college takes pride in maintaining a green, eco-friendly campus with initiatives focusing on energy conservation, waste management, and water conservation.

VISION & MISSION

At the College of Applied Science Mavelikkara (IHRD), we are dedicated to fostering a dynamic learning environment that empowers students to excel in their academic and professional pursuits. Our mission is to provide comprehensive education through innovative undergraduate and postgraduate programs in Computer Science, Electronics, Commerce, and Business Administration. We aim to cultivate critical thinking, technical proficiency, and ethical leadership, equipping our students with the skills necessary to thrive in a rapidly changing global landscape. By integrating practical experience with theoretical knowledge, we strive to produce well-rounded graduates who contribute positively to society and drive advancements in their respective fields. Industry On Campus (IOC) Project helps the students to earn while they are Learning. Mission Through a commitment to excellence, collaboration, and continuous improvement, we endeavor to be a leading institution that inspires lifelong learning and fosters a spirit of inquiry and Innovation.

Our vision at the College of Applied Science Mavelikkara (IHRD) is to be a premier institution recognized for excellence in education and research in the fields of Applied Science, Technology, and Commerce. We aspire to create a vibrant academic community that nurtures creativity, innovation, and entrepreneurship among our students. We are Science, Technology, and Commerce. We aspire to create a vibrant academic community that nurtures creativity, innovation, and entrepreneurship among our students. We envision producing skilled, adaptable graduates who are not only proficient in their disciplines but also committed to ethical practices and societal development. Through state-of-the-art facilities, industry partnerships, and a focus on holistic education, we aim to empower our students to become leaders and change makers in an increasingly interconnected world. In pursuit of this vision, we strive to promote a culture of lifelong learning, interdisciplinary collaboration, and social responsibility, preparing our students to meet the challenges of the future with confidence and integrity.

INTRODUCTION TO ENERGY AUDITING

Energy auditing is a systematic process of analyzing energy consumption within an institution or organization. The aim is to identify opportunities for energy conservation and efficient utilization of available resources. This report evaluates the energy usage in the College of Applied Science, Mavelikkara, focusing primarily on electricity consumption, cost analysis, and potential improvements.

Objectives of the Energy Audit

The main objectives of conducting the energy audit are:

- To assess the present level of energy consumption.
- To analyze electricity bills and patterns of usage
- To identify areas where energy savings are possible.
- To suggest alternative renewable energy sources.
- To promote sustainable energy practices within the campus.

Limitations of Energy Audit

Like any study, the energy audit also has certain limitations:

- Dependence on availability and accuracy of data.
- Limited scope due to financial and technical constraints.
- Seasonal variations in energy consumption.
- Restricted access to some utility systems.
- Despite these challenges, the audit provides a valuable baseline for future energy management strategies.

Committee Members

An Energy Audit Committee was formed in the college to oversee the process of conducting the audit. The committee comprises faculty members, administrative staff, and student representatives. The committee ensures proper data collection, verification, and report preparation.

Committee Members:

FACULTIES

1. SOBHA R V
2. SARANYA P M
3. SREEKKUTTAN R

STUDENTS

SL. NO.	STUDENT NAME	CLASS
1	ABHIJITH S	**S5 BSC ELECTRONICS**
2	VISHNU V	**S3 BSC ELECTRONICS**
3	ABHIJITH A	**S3 BSC ELECTRONICS**
4	NAVANEETH V	**S3 BCA**
5	AJUKRISHNAN	**S3 BSC CS**
6	VIGNESH V PILLAI	**S3 BSC CS**

Sources of Energy in the College

The College of Applied Science, Mavelikkara, primarily depends on electricity supplied by the Kerala State Electricity Board (KSEB). The main sources of energy in the college include:

- Electricity from KSEB grid.
- Backup power from generators.
- Solar panels installed on select buildings (where available).
- Minor renewable energy initiatives under consideration.

Main Energy Consuming Machines/Equipments considered for Energy Audit

• Lighting & Fans

• Air Conditioners

• Motors & Pumps

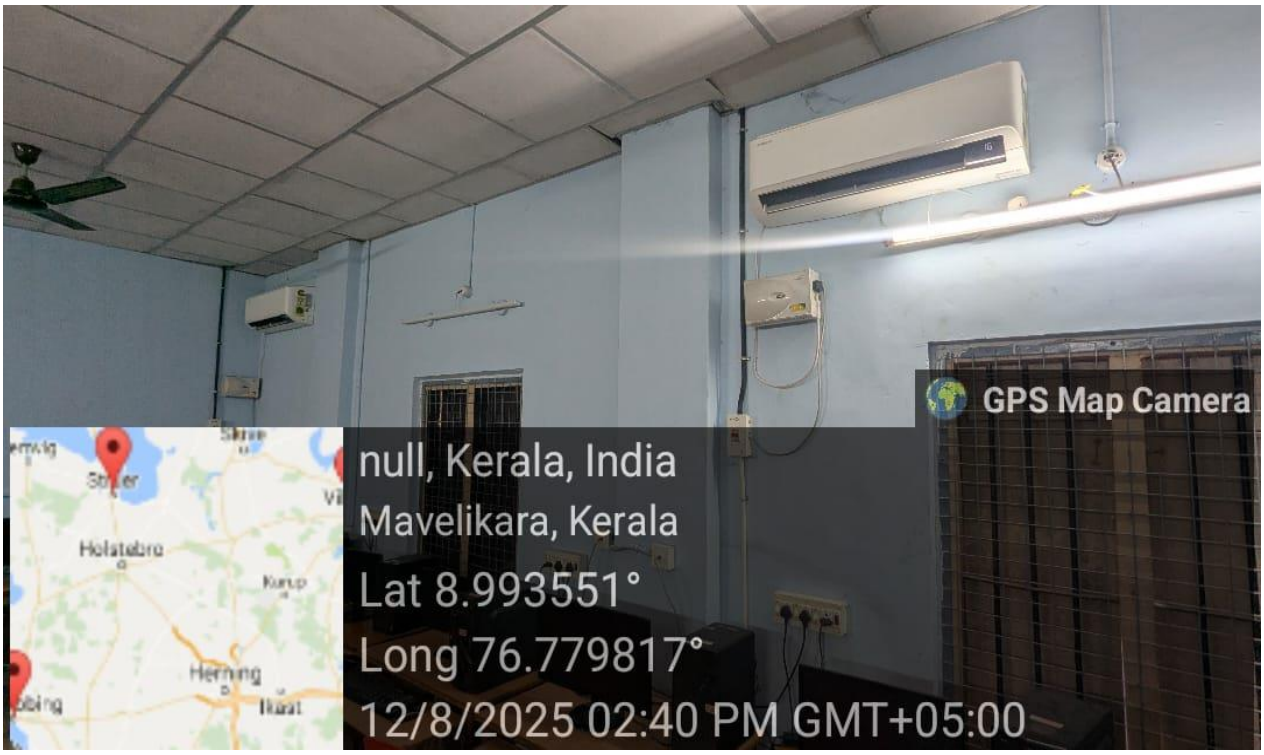
• Desktops & Printers

ELECTRONIC BELL

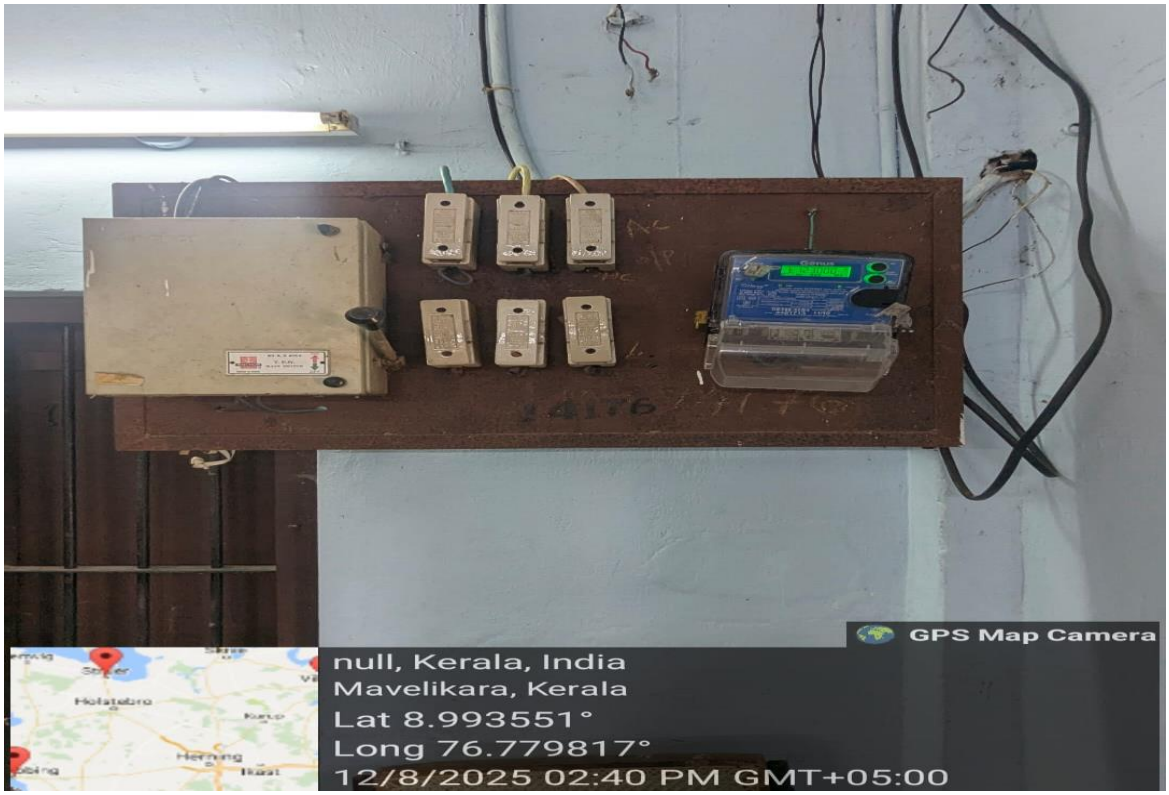
MAIN DISTRIBUTION BOX

GENERATOR

DISTRIBUTION BOX



COMPUTER LAB



ENERGY METER

UPS AND BATTERY

INVERTER AND BATTERY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Thazhakara, Thekkekara, Kerala, India
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Long 76.532614°
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Mavelikara, Kerala
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Long 76.779817°
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UPS

UPS

ENERGY METER

ELECTRICITY CONSUMPTION AND BILL ANALYSIS

Electricity consumption is a major component of energy usage in the college. An analysis of electricity bills from recent years shows the following annual expenditure:

Year	Electricity Expense (₹)
2022	278,377
2023	370,696
2024	506,684
2025	58,103 (JAN-MAR)

The data reveals an increasing trend in electricity expenditure over the years, highlighting the importance of adopting energy efficiency measures and alternative energy sources.

The electricity bill records from 2022 to 2025 highlight the consumption and expenditure pattern of the College of Applied Science, Mavelikkara.

The total expenditure for the year **2022** amounted to **₹2,78,377**, which shows a significant increase when compared with subsequent years. In **2023**, the cost further rose to **₹3,70,696**, reflecting an overall growth in power consumption due to extended academic activities, increased use of laboratory equipment, and infrastructural demands. The trend continued in **2024**, with the bill reaching **₹5,06,684**, the highest among the recorded years. For **2025**, up to March, the expenditure has already touched **₹58,103**, suggesting that the annual expense may follow a similar or higher trajectory if no energy-saving interventions are made.

This steady rise in electricity expenditure emphasizes the urgent need for energy-efficient solutions, including the adoption of renewable energy technologies, effective load management, and awareness programs for both staff and students.

CAS, Mavelikkara - (From 01-Apr-2018)

Electricity Charges

1-Jan-2022 to 31-Mar-2025

Date	Voucher No.	Debit
05/01/2022	592/21-22	**8466.00**
03/02/2022	671/21-22	**27100.00**
03/03/2022	732-733/21-22	**23805.00**
07/04/2022	10-11/22-23	**28448.00**
05/05/2022	77/22-23	**23766.00**
07/06/2022	170-171/22-23	**15667.00**
05/07/2022	280-281/22-23	**28873.00**
05/08/2022	344-345/22-23	**24340.00**
02/09/2022	420/22-23	**7480.00**
02/09/2022	421/22-23	**13754.00**
03/10/2022	482-483/22-23	**22539.00**
03/11/2022	553-554/22-23	**24981.00**
18/11/2022	553-554a	**10.00**
02/12/2022	644/22-23	**29148.00**
03/01/2023	724/22-23	**25200.00**
02/02/2023	807/22-23	**29550.00**
01/03/2023	870/22-23	**31007.00**
03/04/2023	7/23-24	**32922.00**
04/05/2023	49/23-24	**30385.00**
19/06/2023	140/23-24	**16547.00**
20/06/2023	142/23-24	**105.00**
05/07/2023	180/23-24	**28254.00**
07/07/2023	184/23-24	**21619.00**
04/08/2023	254/23-24	**26662.00**
04/09/2023	306/23-24	**30134.00**
05/10/2023	371/23-24	**16660.00**
06/10/2023	374/23-24	**13391.00**
04/11/2023	448/23-24	**30020.00**
02/12/2023	512/23-24	**38240.00**
05/01/2024	559/23-24	**35075.00**
24/01/2024	596/23-24	**80000.00**

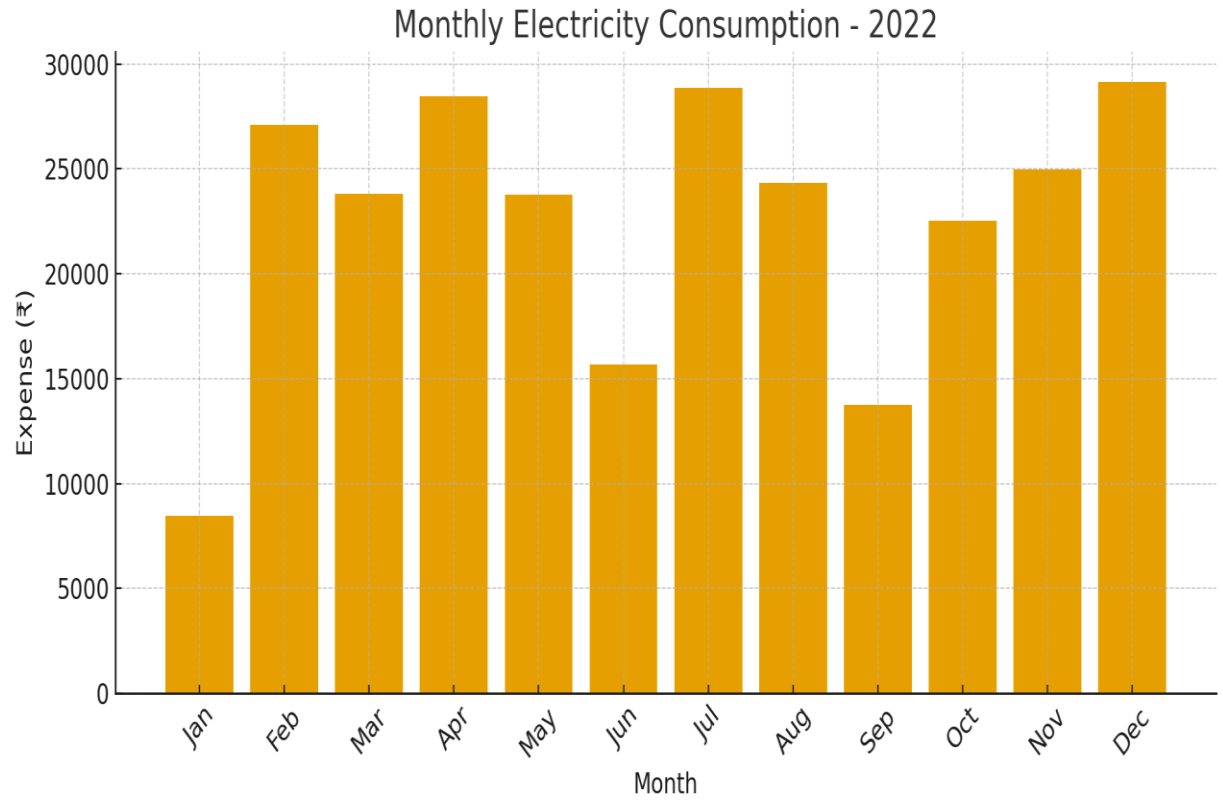
01/02/2024	614/23-24	**23107.00**
08/02/2024	629/23-24	**80232.00**
12/03/2024	699/23-24	**105558.00**
06/04/2024	6/24-25	**26135.00**
06/05/2024	51/24-25	**20522.00**
07/06/2024	95/24-25	**10634.00**
08/07/2024	154/24-25	**9362.00**
07/08/2024	207/24-25	**22526.00**
05/09/2024	316/24-25	**23441.00**
05/10/2024	373/24-25	**19297.00**
12/11/2024	455/24-25	**25080.00**
03/12/2024	501/24-25	**15940.00**
05/12/2024	504/24-25	**9775.00**
07/01/2025	582/24-25	**18490.00**
05/02/2025	637/24-25	**19651.00**
10/03/2025	691/24-25	**19962.00**
	Closing Balance :	1213860.00

Monthly Bill Analysis

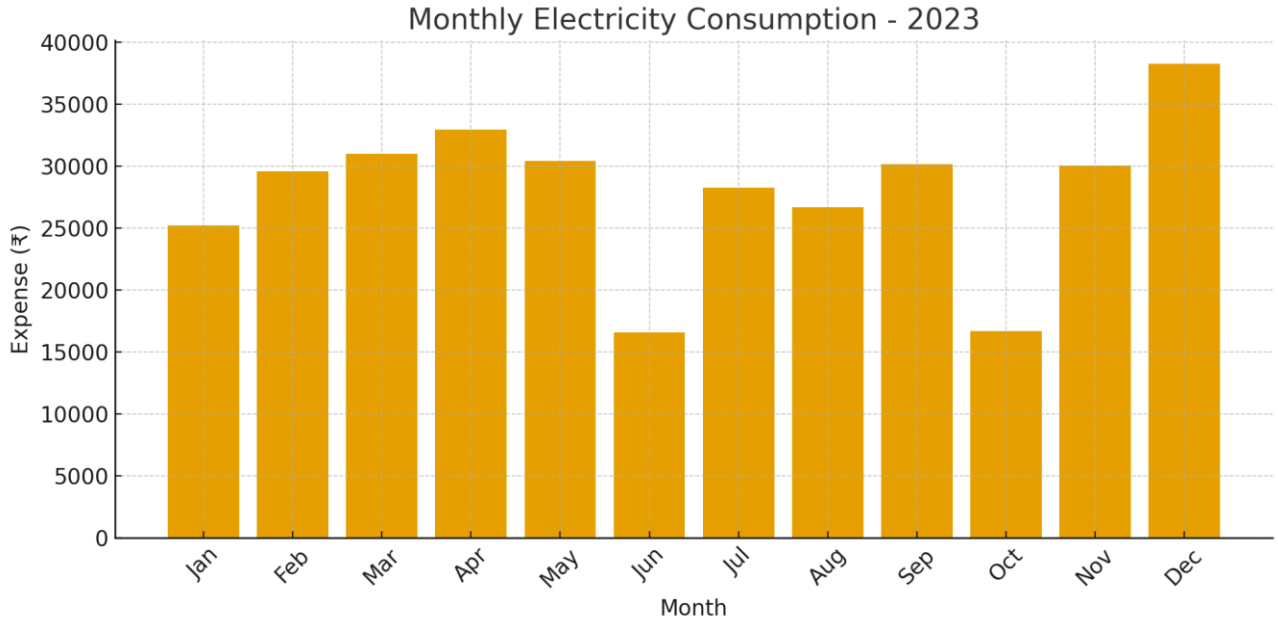
The detailed monthly electricity bills of the College of Applied Science, Mavelikkara provide a clearer understanding of consumption trends. The data indicates that electricity usage is not uniform across months. Some months, such as **March, July, and December**, record comparatively higher expenses, which can be attributed to intensive laboratory activities, examinations, and full utilization of campus facilities.

For example, the monthly bills for the year **2022** ranged between **₹7,480** and **₹29,148**, showing considerable variation in energy demand. The lowest consumption was observed during holiday periods, while peak usage occurred during academic sessions when classrooms, laboratories, and administrative facilities were fully operational.

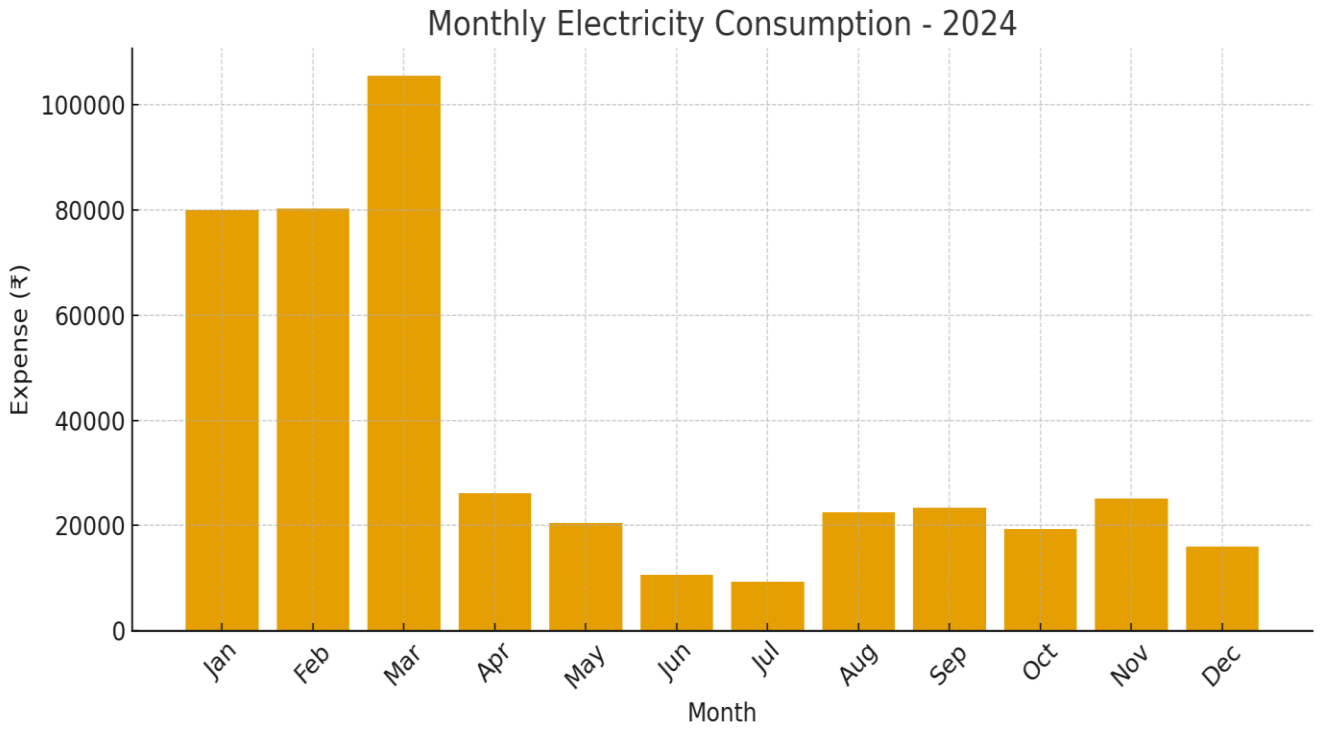
This analysis shows that **seasonal and academic cycles directly influence electricity consumption**. Understanding these fluctuations helps in better planning of energy-saving measures, such as scheduling heavy-load equipment usage during off-peak times, ensuring preventive maintenance of electrical systems, and spreading awareness among students and staff to avoid wastage.



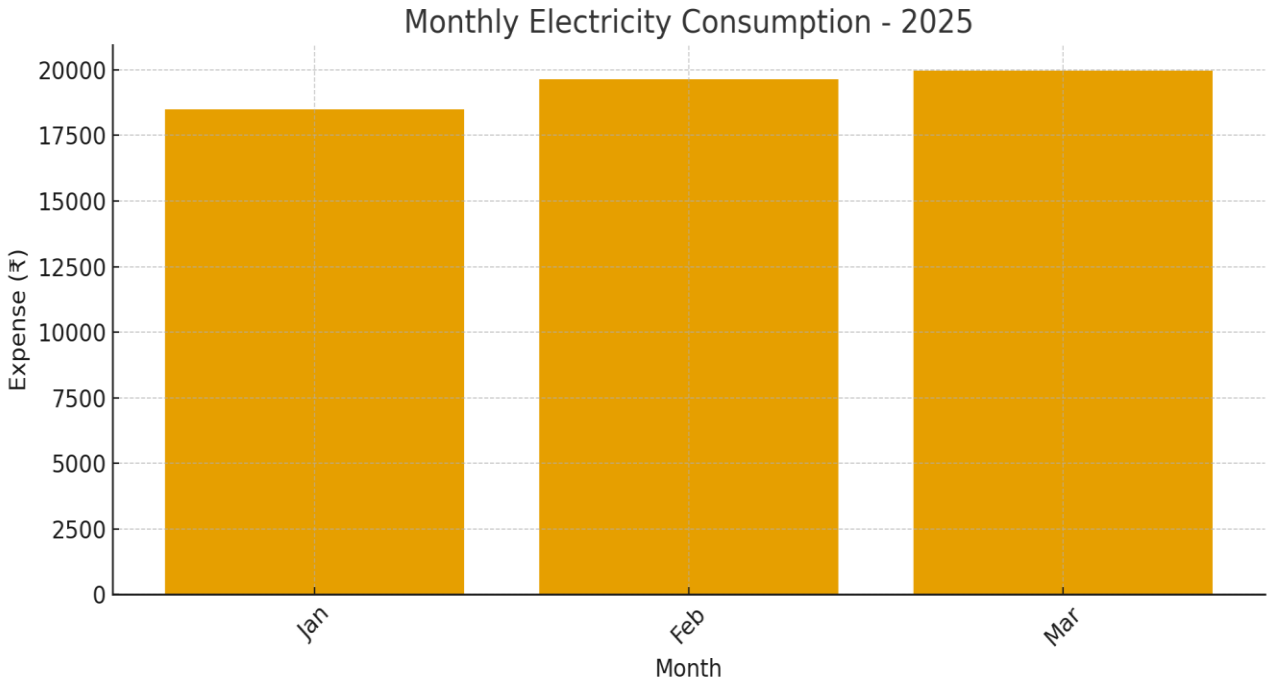
The electricity expenses in 2022 ranged from **₹7,480** to **₹29,148**. The highest expenditure occurred in **December (₹29,148)**, likely due to extended academic sessions and examination-related activities requiring intensive use of classrooms and laboratories. The lowest consumption was in **September (₹7,480)**, which may be linked to holidays or reduced campus activities. Overall, 2022 shows moderate variations with periodic peaks in power usage.



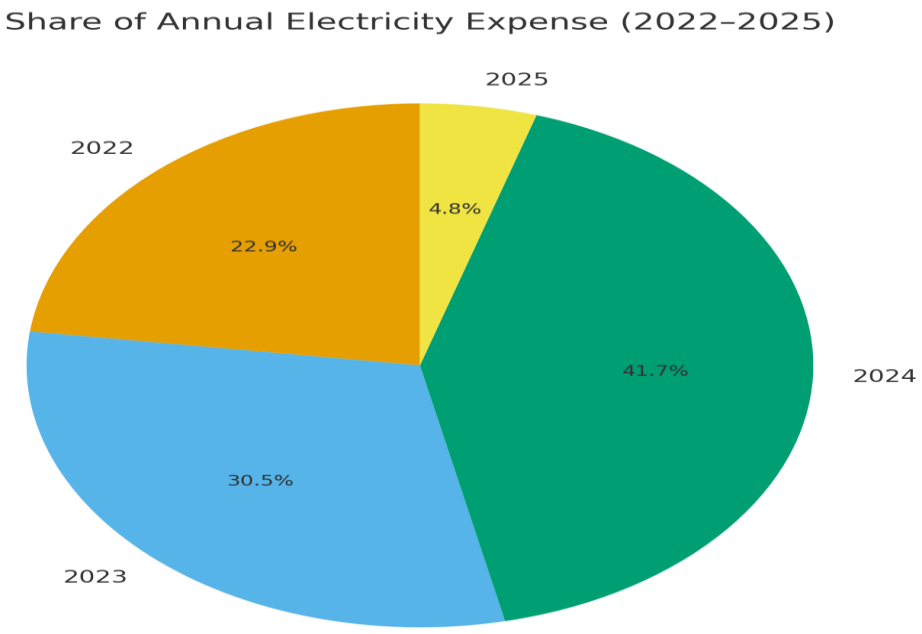
In 2023, the college recorded a noticeable rise in electricity bills, ranging between **₹12,000 and ₹42,000**. The expenses peaked around **July and December**, coinciding with semester activities and lab usage. Compared to 2022, the overall monthly bills show an upward shift, indicating an increase in campus operations and energy demand.



The year 2024 exhibited the **highest energy expenditure** among the observed years, with monthly bills exceeding **₹40,000 in several months**. This sharp rise could be attributed to expansion of facilities, increased reliance on electrical equipment, or longer working hours of the institution. The chart clearly highlights that 2024 was the most energy-intensive year, underlining the need for energy-saving initiatives.



For the year 2025, data is available only up to March, with expenses totaling **₹58,103**. The first three months already indicate a steady consumption pattern. If the trend continues, the annual expenditure may match or exceed the levels recorded in 2024. This early projection emphasizes the importance of immediate intervention through energy-efficient technologies and strict monitoring of consumption.



The pie chart illustrates the proportion of total electricity expenses for each year from 2022 to 2025. The data shows that **2024 accounts for the largest share**, consuming nearly half of the total expenses within the four-year period. **2022 and 2023** contribute smaller shares, while **2025**, with data available only up to March, shows a relatively small portion. This distribution highlights the steep increase in energy consumption over time and underlines the urgent need for energy management practices.

COMPARATIVE ANALYSIS OF 2022–2025

The electricity consumption trend at the College of Applied Science, Mavelikkara, demonstrates a **consistent increase in energy expenditure** over the years 2022 to 2024. While **2022** recorded a total bill of about **₹2.78 lakh**, the cost rose to **₹3.70 lakh in 2023** and further escalated to **₹5.06 lakh in 2024**, marking the highest expenditure so far. The partial data for **2025 (₹58,103 up to March)** suggests that the yearly consumption is likely to match or even surpass the previous year if no corrective measures are adopted.

The year-on-year rise reflects the combined effects of academic expansion, higher usage of laboratories, extended working hours, and seasonal variations. Importantly, the growth in energy expenses highlights the urgent need for **energy efficiency measures**, including the integration of renewable energy (solar), replacement of outdated equipment with energy-efficient alternatives, and adoption of strict energy monitoring systems.

This comparative analysis provides the institution with a clear roadmap to control costs and ensure sustainable energy practices in the coming years.

RECOMMENDATIONS

Based on the analysis of electricity consumption and energy use at the College of Applied Science, Mavelikkara, the following recommendations are suggested:

1. Energy Efficiency Measures

- Replace all conventional tube lights and CFLs with **LED lighting**.
- Install **automatic sensors** in classrooms, corridors, and washrooms to prevent unnecessary lighting.
- Encourage the use of **energy-efficient appliances** in laboratories and administrative offices.

2. Renewable Energy Integration

- Expand the installation of **solar panels** on rooftops to reduce dependency on the Kerala State Electricity Board (KSEB) supply.
- Explore the use of **solar water heaters** for hostels or laboratories requiring hot water.

3. Monitoring and Control Systems

- Introduce **smart meters** for real-time monitoring of electricity consumption.
- Maintain a **monthly energy audit logbook** to track variations and identify wastage.
- Schedule **preventive maintenance** of electrical equipment to avoid energy losses due to faulty wiring or inefficient appliances.

4. Awareness and Training

- Conduct **workshops and awareness campaigns** for students and staff on energy conservation.
- Encourage a **"Switch Off" campaign** to ensure that fans, lights, and computers are turned off when not in use.

5. Water and Resource Management (Integration with Water Audit)

- Implement **rainwater harvesting** to reduce reliance on municipal water supply.
- Reuse wastewater from laboratories and hostels after basic treatment for gardening and cleaning.
- Install **low-flow taps and fixtures** to minimize wastage.

6. Administrative and Policy Measures

- Form a **Green Campus Committee** to monitor energy and water usage on a regular basis.
- Set **annual energy reduction targets** (e.g., 5% reduction in electricity bills per year).
- Incorporate **energy conservation topics** into student projects and research to generate innovative solutions.

CONCLUSION

The energy audit conducted at the College of Applied Science, Mavelikkara, has revealed important insights into the institution's electricity consumption patterns and expenditure trends. The analysis shows a **steady rise in energy costs from 2022 to 2024**, with 2025 already indicating a similar trajectory. This highlights the urgent need to adopt energy conservation measures and renewable alternatives to ensure long-term sustainability.

The audit not only quantifies present energy usage but also serves as a **baseline for future planning and policy implementation**. By following the recommended measures—such as expanding solar installations, promoting energy efficiency in lighting and equipment, and creating awareness among stakeholders—the college can significantly reduce its dependency on grid electricity and operational costs.

Most importantly, the findings of this audit emphasize that sustainable practices are not just a financial necessity but also a **social and environmental responsibility**. With the collective participation of management, faculty, staff, and students, the College of Applied Science, Mavelikkara, can evolve into a **model green campus** and set an example for other educational institutions in Kerala and beyond.