

PURBASTHALI COLLEGE

PARULIA, PURBA BARDHAMAN

REPORT OF
ENERGY AUDIT

2022-23

B. S. M.

Principal
Purbasthali College
Parulia, Purba Bardhaman.

Certificate of Energy Audit

This is to certify that Purbasthali College, Parulia, Purba Bardhaman underwent a comprehensive energy audit conducted by the Audit Team in the year 2022-23. The data was initially prepared by the college, and the audit team meticulously examined the energy consumption patterns, infrastructure, and operational practices of the institute with the objective of identifying opportunities for optimization and efficiency enhancement during March-June, 2023. Upon thorough assessment and analysis, we hereby affirm that the energy audit process has been completed in accordance with industry standards and best practices. The audit findings have been documented in detail, outlining areas of energy waste, inefficiency, and opportunities for improvement within the institute's facilities. Through this audit, significant insights have been gained regarding the institute's energy usage and potential avenues for cost savings and environmental impact reduction. Furthermore, recommendations have been provided to prioritize energy-saving measures, investments in renewable energy technologies, and operational enhancements. It is further certified that the photographs and data are taken by the college audit preparation team during the preparation of this report.

Date: 25/07/2023

Signature



Mr. Utpal Goswami
Advisor
WBSEDCL



Signature



Dr. Soumya Mohan Ghosh
Coordinator, IQAC
Purbasthali College

**Coordinator IQAC
Purbasthali College**

Signature



Dr. Bibhas Chandra Saha
Principal
Purbasthali College
Principal
Purbasthali College
Parulia, Purba Bardhaman.

Introduction

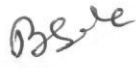
An energy audit serves as a first step in understanding and optimizing energy usage within an organization. It involves a systematic assessment of energy consumption patterns, infrastructure, and operational practices to identify areas of inefficiency and opportunities for improvement. Through detailed analysis and data collection, an energy audit provides valuable insights into where energy is being utilized, how efficiently it is being utilized, and where potential savings can be achieved.

In today's world, educational institutes play a pivotal role not only in shaping young minds but also in setting an example of sustainable practices for the community. However, amidst the quest for academic excellence, energy consumption often remains a significant yet overlooked aspect of operations. This is where an energy audit steps in, offering a comprehensive assessment of energy usage within educational facilities.

An energy audit for educational institutes goes beyond mere examination; it serves as a catalyst for positive change. By meticulously scrutinizing energy consumption patterns, infrastructure, and operational procedures, an energy audit uncovers opportunities for optimization and efficiency enhancement. This process not only helps in reducing operational costs but also aligns with the institution's commitment to environmental stewardship and sustainability.

The objectives of an energy audit in educational institutes are multifaceted. Firstly, it aims to identify areas of energy waste and inefficiency, ranging from outdated equipment to suboptimal building design. By pinpointing these inefficiencies, institutions can take targeted measures to mitigate them, thereby lowering energy bills and freeing up resources for core educational activities.

Moreover, an energy audit fosters a culture of energy awareness and responsibility among students, faculty, and staff. Through engagement and education initiatives, stakeholders can learn about the importance of energy conservation and their role in achieving it. This not only instills sustainable


Principal
Purbasthali College
Parulia, Purba Bardhaman

habits but also empowers individuals to become advocates for energy efficiency both within and beyond the campus walls.

Furthermore, an energy audit can serve as a roadmap for future investments in renewable energy technologies and infrastructure upgrades. By prioritizing recommendations based on cost-effectiveness and environmental impact, educational institutes can transition towards greener energy sources and reduce their carbon footprint. In essence, an energy audit for educational institutes is not just about saving energy—it's about fostering a culture of sustainability, enhancing operational efficiency, and empowering the next generation of leaders to create a more sustainable future.

Methodology

The energy audit at Purbasthali College was conducted to assess the energy consumption patterns, infrastructure, and operational practices within the college campus. The objectives were to identify opportunities for optimization and efficiency enhancement to reduce operational costs and promote sustainability. Prior to the audit, the audit team defined the scope and objectives of the assessment in consultation with college management. Relevant documentation, including utility bills, building plans, and equipment specifications, was gathered to facilitate the audit process. A comprehensive site visit was conducted, encompassing visual inspections of energy-consuming systems across the college campus, along with interviews with the college staffs. Data collection methods included manual recording of equipment information and utilization of data logging devices and energy meters. Energy consumption bills were analyzed to identify consumption trends and anomalies. Energy consumption data was normalized and benchmarked against relevant standards to assess performance and identify areas for improvement. Energy performance assessment involved evaluating lighting systems, cooling systems, and other energy-consuming equipment using appropriate tools and techniques. Factors such as equipment age, maintenance practices, and control strategies were considered during the assessment. Collaborative efforts with the college authorities led to the identification and prioritization of energy conservation opportunities based on potential energy savings, cost-effectiveness, and environmental impact. The audit report summarizes the findings, observations, and recommendations for improving energy efficiency and sustainability at Purbasthali College.



Principal
Purbasthali College
Parulia, Purba Bardhaman.

About the College

Purbasthali College, established in the year 2009, nestled in the pristine landscape of Purbasthali, West Bengal, stands as a beacon of educational excellence and community development. Established with a vision to empower and enlighten the youth of the region, the college has been serving as a cornerstone of learning and growth since its inception. The college is renowned for its commitment to academic excellence across various disciplines. With a diverse range of undergraduate programs, the college caters to the educational needs of students from diverse backgrounds, mostly to the first-generation learners belonging to the agrarian communities. Purbasthali College offers a holistic educational experience that fosters intellectual curiosity, critical thinking, and practical skills development. The college boasts state-of-the-art infrastructure and modern facilities conducive to learning and research. Spacious classrooms, well-equipped seminar halls, and a well-stocked library provide students with the resources they need to excel academically. Additionally, the college campus features recreational areas, sports facilities, and amenities that contribute to the holistic development of students. At Purbasthali College, a team of dedicated faculty members and staff are committed to nurturing the intellectual and personal growth of students. With their expertise, passion for teaching, and mentorship, they create a dynamic learning environment that inspires students to reach their full potential. Beyond academic endeavors, Purbasthali College is deeply engaged in community outreach and social initiatives. Through various outreach programs, the college extends its resources and expertise to the surrounding community, addressing societal challenges and contributing to the overall development of the region. Whether through awareness campaigns, skill development workshops, or community service projects, Purbasthali College remains dedicated to fostering positive change and making a meaningful impact on society.

Energy Conservation Methods at Purbasthali College

Purbasthali College demonstrates a substantial reliance on electrical energy, with an annual consumption of 11,209 KWH and an average monthly usage of 934 KWH. This data underscores the significance of energy management within the institution's operational framework, highlighting the need for effective conservation strategies to mitigate energy costs and environmental impact.



Principal
Purbasthali College
Parulia, Purba Bardhaman

However, the college has implemented proactive measures to optimize energy usage and promote sustainability. With a total of 241 LED lights, 37 CFL lamps, and 205 Tube Lights installed across its facilities, Purbasthali College prioritizes the use of energy-efficient lighting solutions. By leveraging these technologies, the college not only reduces electricity consumption but also lowers maintenance costs and enhances lighting quality for optimal learning and working environments.


Moreover, the institution has embraced renewable energy solutions as part of its sustainability agenda. The installation of four solar street lights and the ongoing application for Solar Grid Connection to the Government of West Bengal exemplify Purbasthali College's commitment to harnessing clean and renewable energy sources. By incorporating solar power into its energy portfolio, the college not only reduces its carbon footprint but also contributes to the transition to a more sustainable energy future.

Furthermore, Purbasthali College prioritizes energy awareness and conservation among its stakeholders. Staff members and students are actively encouraged to turn off electrical appliances when not in use, fostering a culture of energy conservation within the campus community. Additionally, the institution promotes the use of standby mode options for equipment, further optimizing energy usage and minimizing unnecessary consumption.

In line with its sustainability goals, Purbasthali College also prioritizes the purchase of efficient and environmentally friendly appliances. With 24 computers, 10 printers, 2 laptops, and 2 Xerox machines, the college ensures that its equipment portfolio aligns with energy efficiency standards, reducing energy waste and operational costs.

Moreover, the transition from fluorescent bulbs to CFL bulbs/LEDs, coupled with the maintenance of an in-house mechanism for electrical fault repair, underscores the institution's commitment to energy efficiency and operational sustainability. Additionally, with a significant percentage of electronic notices (100%) and a reduced reliance on paper notices (20%) for academic and administrative purposes, Purbasthali College demonstrates a holistic approach to sustainability, integrating energy conservation into its everyday practices and operations.

In a typical classroom at Purbasthali College, there are an average of six lights and fans installed to provide adequate illumination and comfort for the occupants. These lighting and fan fixtures are


Principal
Purbasthali College
Parulia, Purba Bardhaman.

strategically positioned to ensure optimal distribution of light and air circulation throughout the space, enhancing comfort and productivity for students and faculty alike.

During daytime hours, both lights and fans are utilized for an average of six hours per day, aligning with the operational schedule of the college. While natural light from external sources plays a significant role in illuminating the classrooms, the supplementary use of electric lighting and fans ensures consistent comfort and functionality within the learning environment.

Each classroom is equipped with four windows, facilitating the entry of natural light and cross ventilation. These windows are strategically positioned to maximize the ingress of sunlight while minimizing glare and heat gain, creating a conducive learning atmosphere that promotes concentration and well-being.

On average, natural light serves as a primary light source in classrooms for approximately six hours each day. This ample exposure to daylight not only reduces the reliance on artificial lighting but also contributes to energy savings and environmental sustainability. Moreover, the presence of natural light enhances the overall aesthetics of the classroom, creating a more inviting and stimulating learning environment for students.

It was also observed that the college only possesses 4 air conditioning system with three located in the Seminar Hall and one in the Principal's Chamber, all of which are five-star rated which further highlights the effort of the college to consume less energy. The air conditioning systems are utilized rarely which is also commendable.

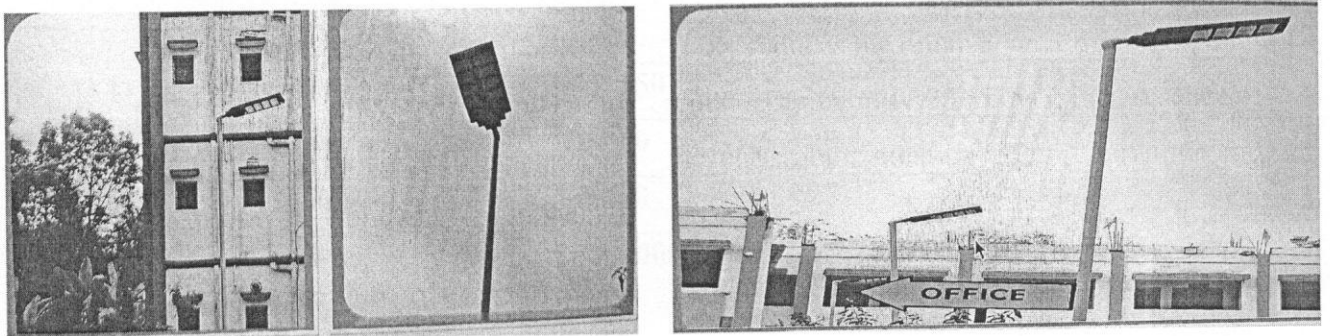


Fig. 1 and 2. Solar Street Lights at Purbasthali College

B. S. Ue

Principal
Purbasthali College
Parulia, Purba Bardhaman,

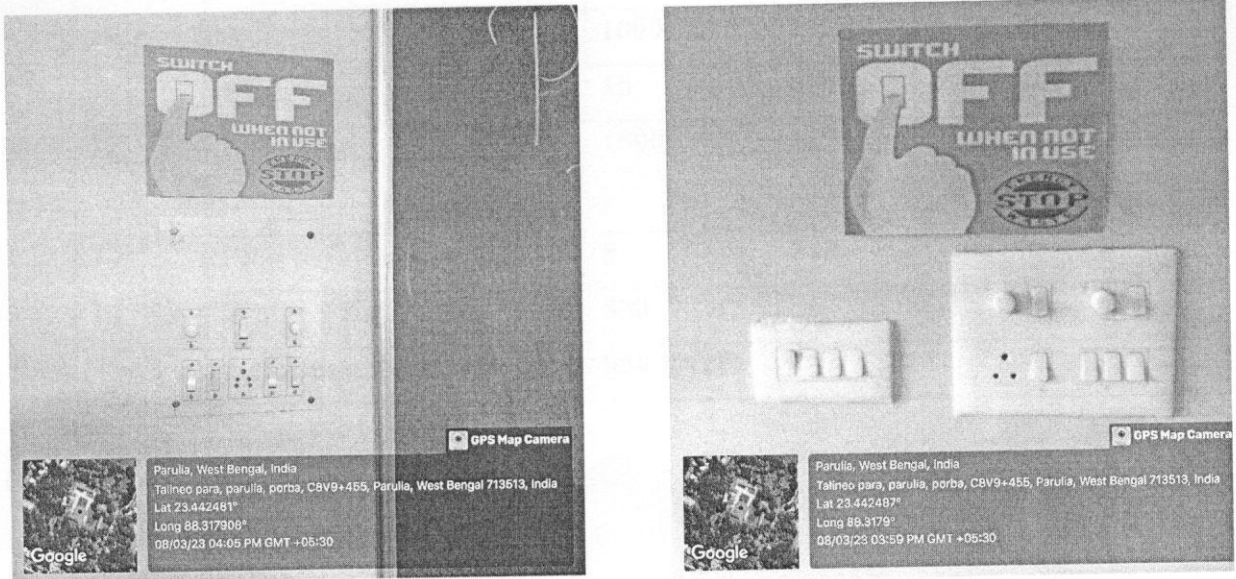


Fig. 3 and 4. Energy Conservation Technique at Purbasthali College

Major Electrical Instruments Consuming Significant Energy

Sl No.	Item	No. of Units	Total Wattage	Average Usage per Month (in hours)	Total Consumption per Month (in kWh)
1	Desktop	24	150	34	122
2	Laptop	02	50	90	9
3	Printer	10	50	22	11
4	Xerox machine	02	1000	12	20
5	Projector	4	300	52	62
6	LED lights	241	9	90	195
7	CFL lights	37	22	34	27

B. S. Saha
Principal
Purbasthali College
Parulia, Purba Bardhaman.

8	Tube lights	205	40	8	65
9	Fan	243	60	9	131
10	AC	4	1000-2000	10	80
11	CCTV	16	15	624	149
12	Induction Oven	1	1500	12	18
13	Plug points	several	5	110	3
14	Water pump	2	800	26	42
Total units consumed (per month)			934 KWH		

Recommendations

Based on the energy audit findings and the current energy consumption patterns at Purbasthali College, the following recommendations are suggested to further enhance energy efficiency and sustainability:

- Continue pursuing the installation of solar panels and explore opportunities to expand solar energy integration across the campus utilizing the vast expanse of roof top
- Consider replacing older lighting fixtures, such as CFL lamps and tube lights, with energy-efficient LED lights throughout the campus
- Implement a policy to restrict the usage of electric lights during daylight hours, especially in areas with ample natural light sources such as classrooms and common areas
- Implement a monitoring system to track the operation of pumps and water systems, particularly to detect instances of overflow or water wastage
- Organize regular awareness programs and training sessions for staff and students on energy conservation and sustainable practices.

Conclusion

In conclusion, the energy audit conducted at Purbasthali College has provided valuable insights into the institution's energy consumption patterns and sustainability practices. With a thorough

B. Saha
Principal
Purbasthali College
Parulia, Purba Bardhaman.

assessment of electrical equipment, lighting systems, cooling systems, and energy usage behaviors, the audit has identified areas for improvement and opportunities for energy conservation. The findings of the energy audit highlight the college's proactive approach to energy efficiency, as evidenced by the utilization of energy-efficient lighting, the adoption of renewable energy solutions such as solar power, and the implementation of energy-saving practices among staff and students. Additionally, the presence of energy-efficient appliances, maintenance mechanisms for electrical faults, and adequate illumination and ventilation in classrooms underscore the institution's commitment to creating a sustainable learning environment. Moving forward, the recommendations outlined in the audit report provide a roadmap for Purbasthali College to further enhance its energy efficiency efforts and reduce its environmental impact. Overall, the energy audit serves as a catalyst for positive change, guiding Purbasthali College towards a more sustainable and energy-efficient future.

Signature



Mr. Utpal Goswami
Advisor
WBSEDCL



Signature



Dr. Soumya Mohan Ghosh
Coordinator, IQAC
Purbasthali College

**Coordinator IQAC
Purbasthali College**

Signature



Dr. Bibhas Chandra Saha
Principal
Purbasthali College
**Principal
Purbasthali College
Parulia, Purba Bardhaman.**