ST. XAVIER'S COLLEGE JAIPUR

Nevta - Mahapura Road, Jaipur - 302029, Rajasthan, India

Affiliated to the University of Rajasthan
Approved under Section 2(f) &12(B) of the UGC Act, 1956
A Christian Minority Jesuit Institution
An ISO 14001:2015 Certified Institution

Institutional Energy Conservation - Practices

1. *Solar Power Systems*

- Continued operation and expansion of solar photovoltaic units (300 kW).
- Regular maintenance and performance monitoring of solar installations.
- Usage of solar-generated power as the priority source where applicable.

2. *Efficient Lighting System*

- Use of LED fixtures in all indoor and outdoor areas.
- Phasing out fluorescent and low-efficiency lighting.

3. *Equipment Standards*

- Procurement of only star-rated or energy-efficient equipment (computers, AC units, refrigerators, etc.).
- Set AC temperature at 24–26°C, the most energy-efficient range as encouraged by Bureau of Energy Efficiency (BEE).
- Use of LED display monitors in computer labs, library and offices.

4. *Smart & Sensor-Based Automation*

- Occupancy sensors for lights, ventilation, water pump control and other appliances.
- Timer-based or daylight-sensing systems for outdoor lighting.

5. *Architectural & Structural Energy Optimization*

- Prioritizing naturally lit and naturally ventilated spaces in construction and refurbishment.
- Integration of energy-efficient architectural, naturally lit spaces and design practices.

6. Energy audit findings and carbon reduction and coal saved calculations

- The internal and external energy audit demonstrate a measurable reduction in coal usage, minimized deforestation impact and substantial CO_2 savings, thereby supporting improved environmental quality, compliance with sustainability standards and alignment with long-term institutional energy conservation policy objectives.

- The link to the evidence of the practice:

https://drive.google.com/file/d/14DMBLlf9oTaftVQKgJusBx8ZYHl87c-s/view?usp=drive_link

- *The link to the evidence of sensor based lighting in the corridor:*

https://drive.google.com/file/d/1SeTIzdsPzaV-WgOnj83ocJlJVHHq0NCh/view?usp=drive_link

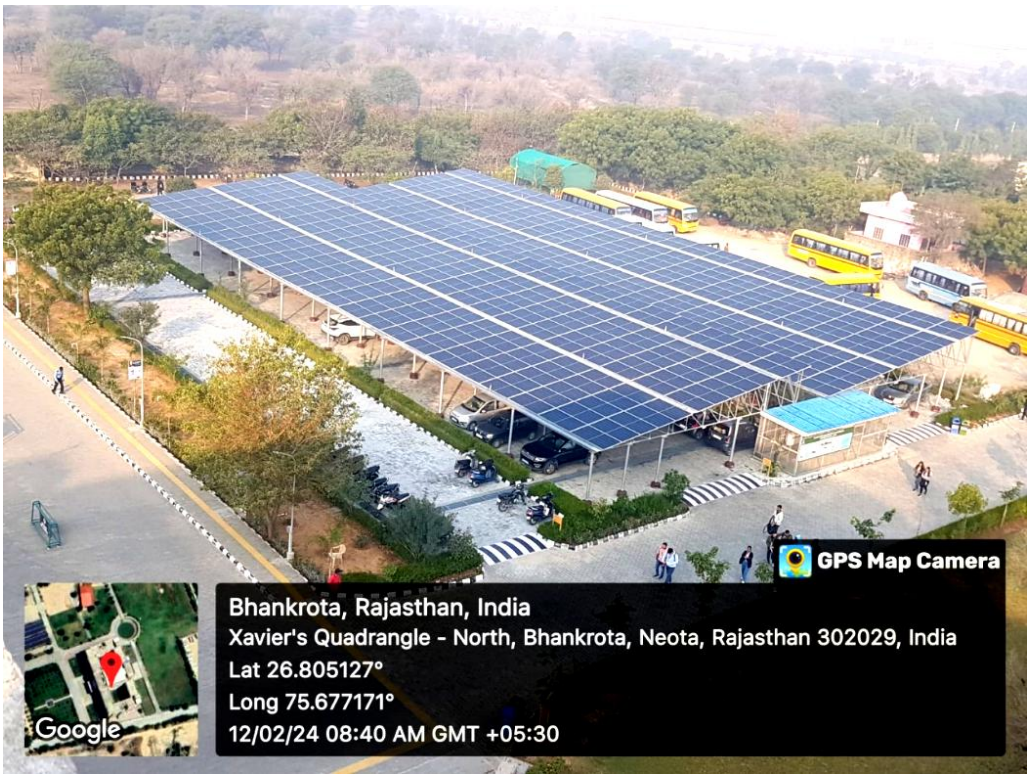

Figure 1: Solar power for electricity generation, reducing reliance on non-renewable resources and mitigating climate change (2024).

Figure 2: Solar power for electricity generation, reducing reliance on non-renewable resources and mitigating climate change (2025).

Figure 3: Solar Panel (2024)

Figure 4: Solar Panel (2025)

S.No	Month	Solar Energy Production (kWh)	Coal Reduction (Kg)	Reduced Deforestation	Reduced CO_2 (Kg)
1	July	72992	66423	2654	58393
2	August	15712	14298	571	12569
3	September	5968	5431	217	4774
4	October	25056	22800	911	20004
5	November	37136	33794	1350	29708
6	December	26496	24111	963	21196

Table 1: Details of Solar energy production, Coal reduction, reduced deforestation and reduced CO_2 in achieving SDG-7. (July - December, 2024)

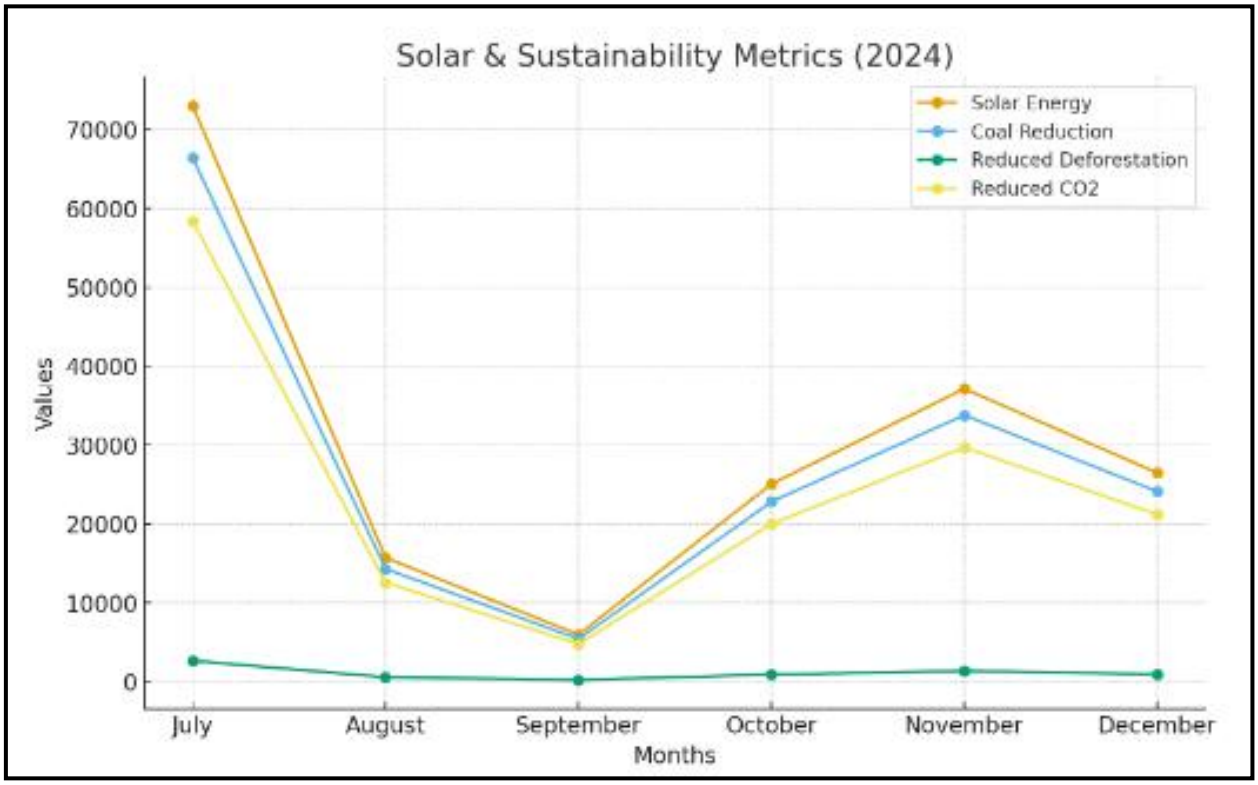

Figure 5: Solar & Sustainability Metrics for 2024 (July - December, 2024)

Interpretation:

- Peak solar generation occurred in July, which resulted in the highest values of coal reduction and CO_2 reduction - indicating maximum renewable energy impact at the start of the observation period.

- Solar energy production significantly dropped in August and reached its lowest in September, which correspondingly reduced coal savings, forest preservation and CO_2 reduction - showing a clear dependency of environmental benefits on solar production.

- A noticeable recovery began in October, where all sustainability metrics started rising again, indicating improved energy output and reduced fossil fuel reliance.

- November showed the second-highest sustainability performance, with strong values across all metrics, suggesting seasonal or climatic factors favoring solar generation.

- December saw a slight decline compared to November, but the performance still remained significantly higher than August–September, reflecting stable renewable energy output during winter months.

- Overall: the environmental benefits (coal reduction, forest conservation, and CO_2 reduction) closely followed solar energy production, demonstrating a consistent and positive correlation.

S.No	Month	Solar Energy Production (kWh)	Coal Reduction (Kg)	Reduced Deforestation	Reduced CO_2 (Kg)
1	January	25472	23180	984	21651
2	February	29728	27052	1149	25269
3	March	28560	25989	1103	24276
4	April	43792	39850	1692	37223
5	May	44160	40185	1706	37536
6	June	41136	37434	1589	34966

Table 2: Details of Solar energy production, Coal reduction, reduced deforestation and reduced CO_2 in achieving SDG-7. (January - June, 2025)

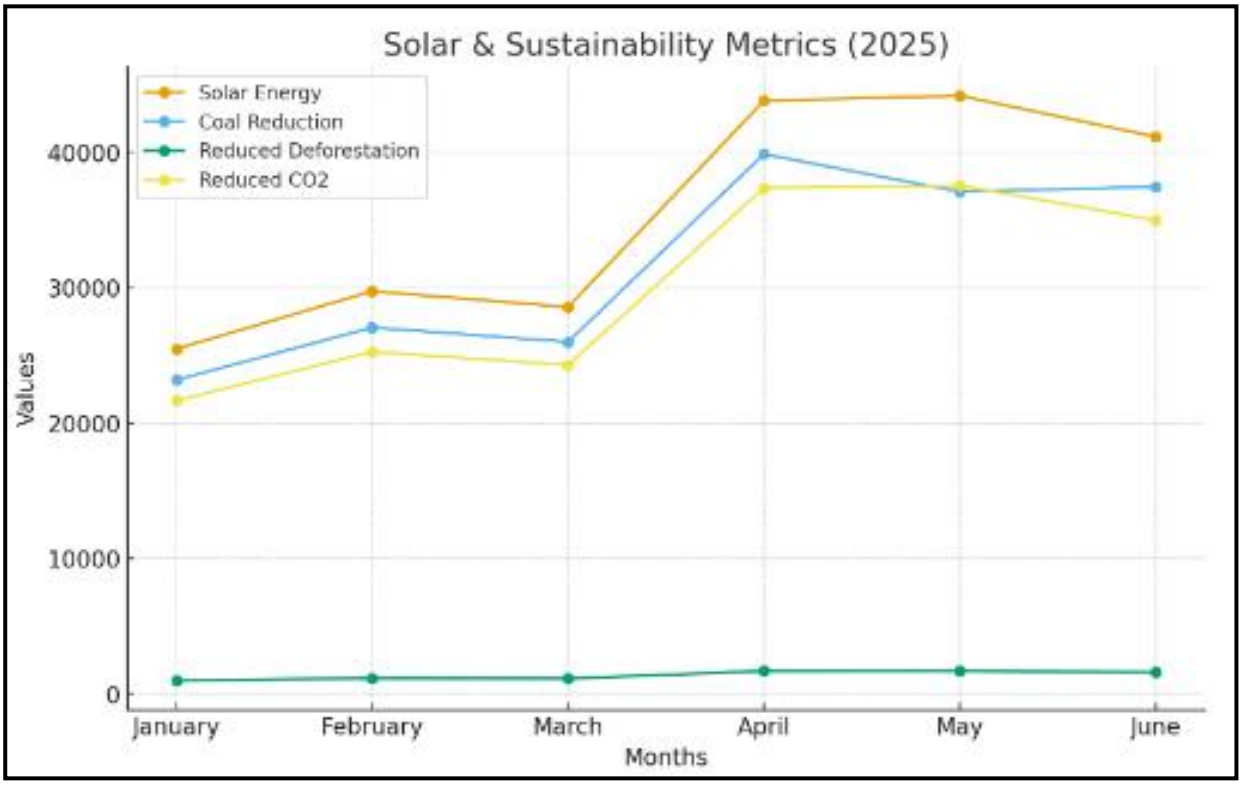

Figure 6: Solar & Sustainability Metrics for 2025 (January - June, 2025)

Interpretation:

- A gradual increase in solar energy production was observed from January to March, leading to a parallel increase in coal reduction and CO_2 reduction - indicating growing use of renewable energy post-winter.

- A sharp rise occurred in April, where solar production and all sustainability indicators reached significantly higher levels - marking a seasonal peak in energy generation.

- May maintained the upward performance, almost matching April, suggesting strong solar availability during the summer months.
- June showed a slight reduction, but overall solar generation and environmental benefits remained high compared to early-year levels.
- Reduced deforestation values remained modest but stable, showing a consistent positive trend in reduction of reliance on biomass and wood-based combustion.
- Overall: Steady improvement in renewable energy use through 2025, with April–May being the best performing months in terms of impact on reducing fossil fuel dependency.

The reduction in coal usage directly lowered dependence on fossil fuels, thereby decreasing greenhouse gas emissions and air pollutants associated with coal combustion. This shift to solar energy resulted in a measurable reduction in CO_2 emissions, contributing to improved air quality, slower global warming, and healthier atmospheric conditions. Additionally, the decrease in deforestation helped preserve forest ecosystems, protected wildlife habitats, and sustained natural carbon sinks critical for absorbing CO_2. Together, these efforts worked drastically: less coal burning meant cleaner skies, less pressure on forests for resource extraction and a meaningful reduction in the institution's overall carbon footprint - supporting climate resilience and aligning with long-term sustainability goals.

Figure 7: Naturally lit spaces

Figure 8: Naturally lit spaces

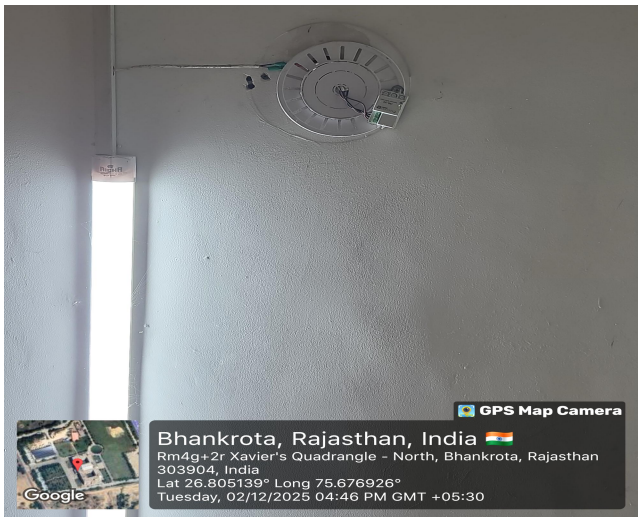

Figure 9: Motion/ Occupancy Sensor

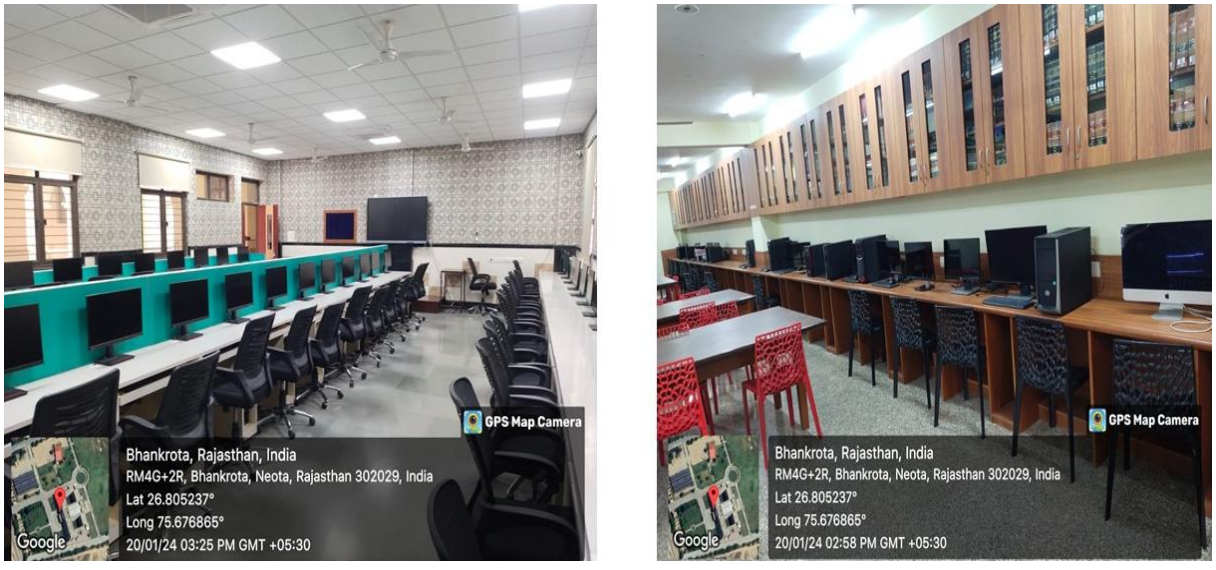

Figure 10: Use of LED monitors

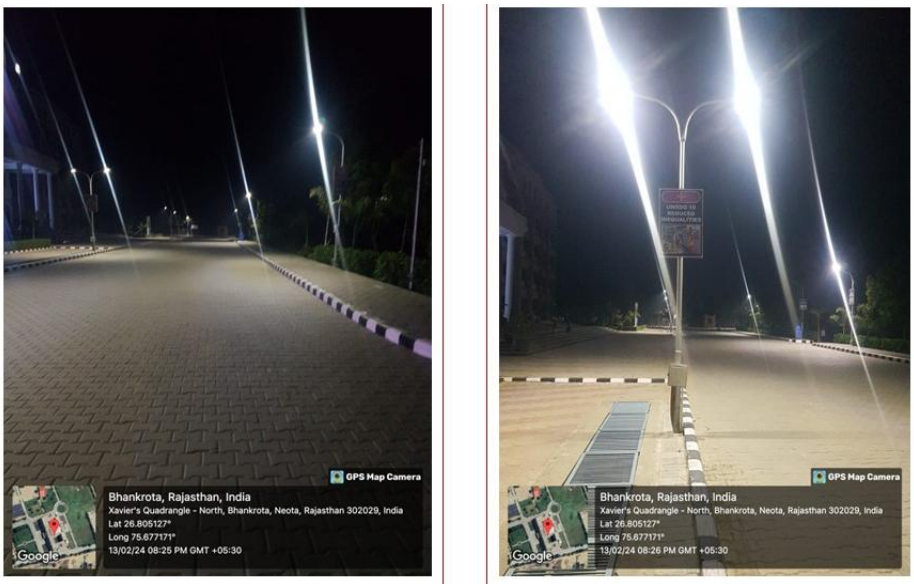

Figure 11: LED street lights

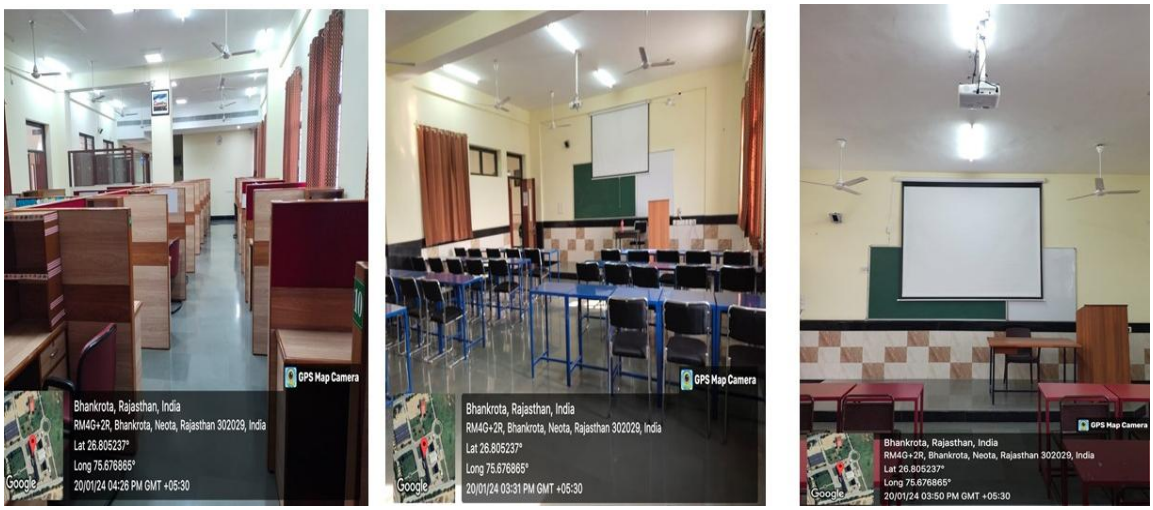

Figure 12: Use of LED lights

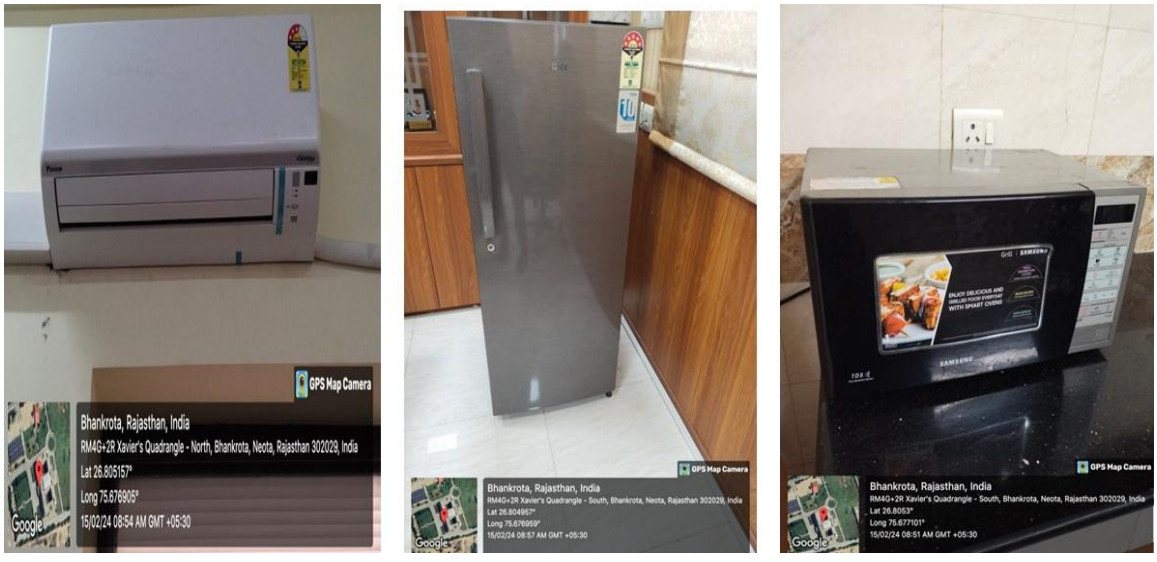

Figure 13: Use of Energy Saving Appliances

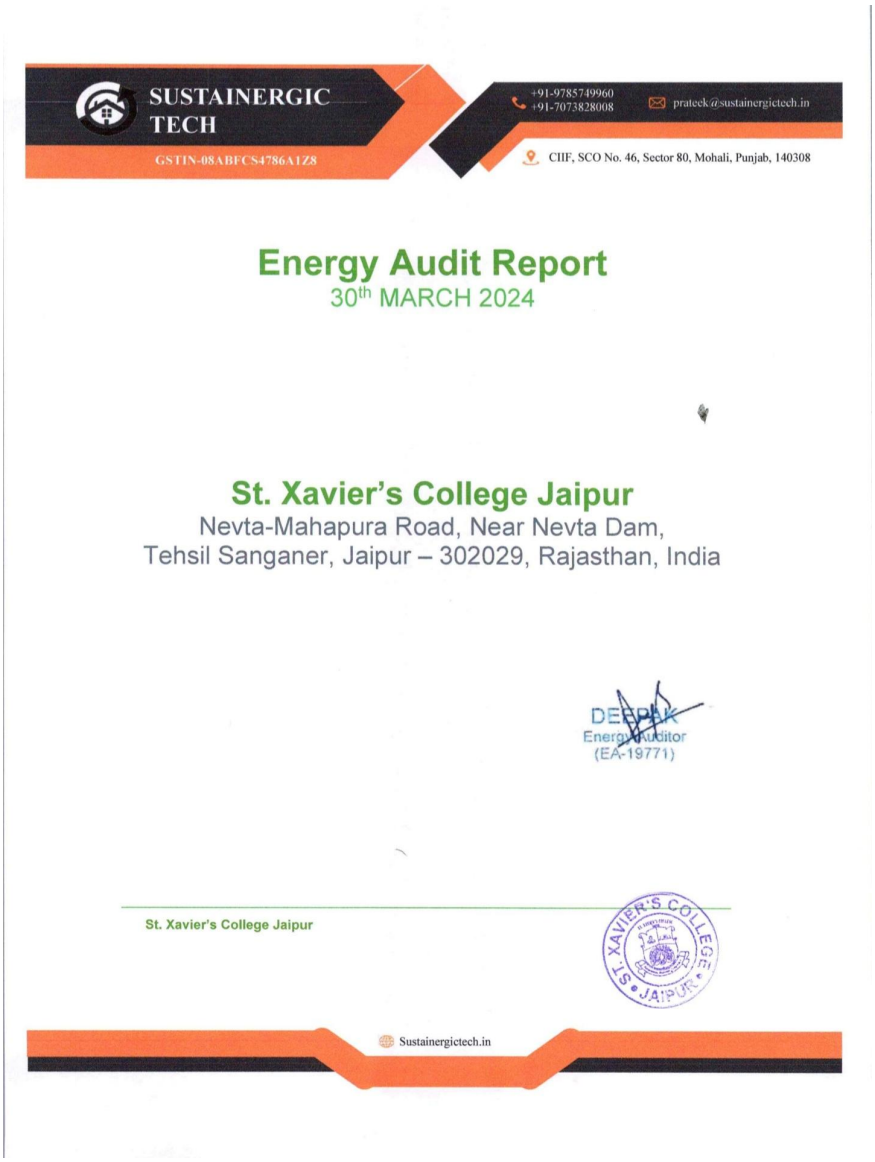

Figure 14: Energy Audit Report, 2024