



SETH RL SAHARIA GOVERNMENT PG COLLEGE, KALADERA, JAIPUR

Energy Audit report



Report prepared.
by: -

COL.EAD LLP

Linking Environmental & Architectural Design [Collaboration]

Integrated Sustainable Building Design Consultants



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ACKNOWLEDGEMENT

CoLEAD LLP is an Integrated Sustainable Building Design and Green Building Consultancy. CoLEAD specializes in designing, auditing, and retrofitting buildings for improved Energy and resource efficiency and occupant comfort and wellbeing.

CoLEAD is recognized as a Startup by DPIIT, and our energy audit division – ergEnomics is incubated under GGSIP University, New Delhi, Delhi Government for its endeavors in the field of Building science, sustainability and measurements and verifications.

CoLEAD comprises of qualified architects and engineers specializing in Building Energy Performance and accredited by various National and International Green Building Certification agencies including GRIA (TERI), LEED (USGBC) and IGBC.

CoLEAD has successfully delivered green building projects pan India with reputed Government and Private clients and extend a note of thanks to the NAAC Core committee members of SRL Saharia College, Kaladera, Jaipur, Rajasthan to invite us to conduct their Energy Audit.

We are thankful to the faculty coordinators for the Energy audit exercise, without their support, this audit would not be able to be completed.

We are thankful to the other Teaching Staff of the College for giving us necessary inputs to carryout this very vital exercise of Green Audit. We are also thankful to other non-teaching staff members who were actively involved while collecting the data and conducting field measurements.



For COLEAD LLP

Date: 3/06/2023

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DISCLAIMER

CoLEAD's Energy Audit Team has prepared this report for SRL Saharia College based on input data submitted by the representatives of university complemented with the best judgment capacity of the expert team. While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived at by best estimates, calculations and approximations using standards, and no representation, warranty or undertaking, express or implied, is made and no responsibility is accepted by the Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements, or forecasts in the report.

CoLEAD and its staff shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.



Date: 3/06/2023

For COLEAD LLP

Partners

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CONTEXT FOR ENERGY AUDIT

To comply with the National Assessment and Accreditation Council (NAAC) guidelines, Higher Educational Institutions are required to submit an annual Green Audit Report starting from the academic year 2016-17. Additionally, it is the responsibility of these institutions to contribute to the reduction of global warming by implementing measures to reduce their carbon footprint as part of their Corporate Social Responsibility. To fulfill the NAAC's requirements, the College Management has chosen to conduct an external Green Evaluation conducted by an independent agency with qualified auditors.

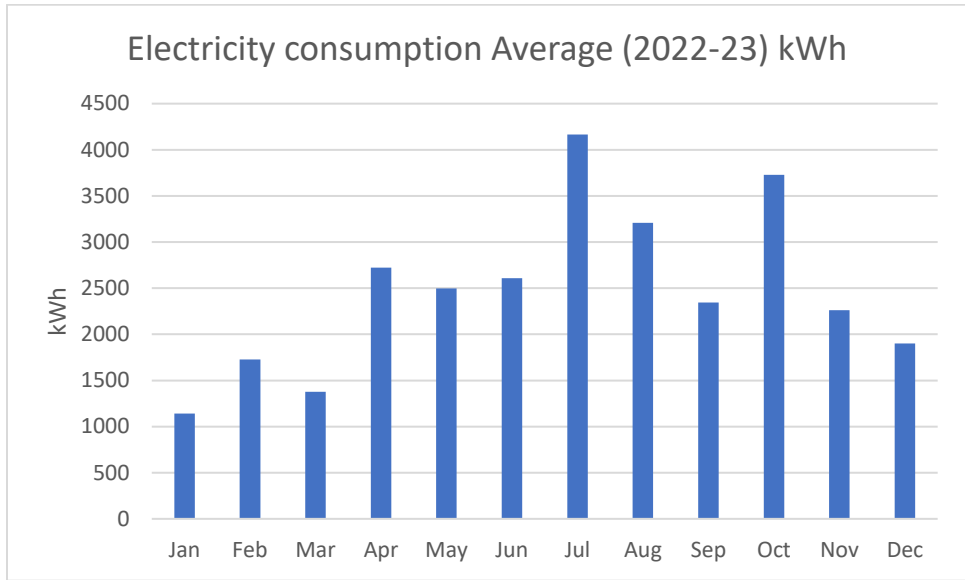
ENERGY USE & ITS CONSERVATION

The following Environmental-Green practices are being followed by SRL Saharia College is as below:

1.	How much energy is used and saved by the College (in KW per month) per day/per month/per year?	The SRL Saharia College uses energy KWH in year. Annual energy used 34,440 kWh/Year
2.	List ten ways that you use energy in your college. (Electricity, LPG, firewood, others).	The campus uses Electricity for Lighting, Fans and College equipment like Computers, boards, and lab equipment. LPG is used in the Canteen for cooking. A detailed list of Lab equipment is attached. View Documents
3.	Are there any energy saving methods employed in your college? If yes, please specify. If no, suggest some methods.	Minimum use of Air conditioning. Only installed in Labs and Conference rooms. The college buildings are naturally ventilated with maximum passive cooling and use of Ceiling fans. Old Tungsten and Halogen lamps have been replaced upto 40% by CFL and LED bulbs. Old fans are being replaced with Energy efficient BLDC fans. Sign boards are displayed at various locations to inform students and staff about energy savings. Use of natural lights and natural ventilation are promoted.
4.	How many CFL/LED bulbs has your college installed? Mention energy used by LED bulbs?	Tungsten lights are present in some classrooms, corridors of old building, Science building, Hostel and Library. They can be replaced with CFL or LED. However newly constructed buildings like new building RUSA, NSB etc. are fitted with CFL, LED or tube lights. College is planning to replace tungsten lights with CFL/LED.
5.	Are any alternative energy sources employed / installed in your college? (Photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.) Please Specify.	Yes, photovoltaic cells for solar energy are being used as a source of renewable energy through a solar PV establishment (21 KW) already commissioned by college.
6.	Do you run "switch off" mock-drills at college?	Yes, the College regularly organizes mock drills for the switch off campaign.

7.	How much energy (per month) is being saved by the use of efficient technologies by SRL Saharia College?	Yes, 32,000 KWH annually is the Renewable Energy potential that can offset 100% energy demand annually
8.	Does the classroom have sufficient solar light illumination? Provide details.	Yes, National Standard for interior illumination for educational institute is 200/300/500 for lecture theatre, the SRL Saharia College complying as per the International / Indian standard IS-3646 (Part-I), 1992 (Range of illumination in lux should be 300/500/750 lux).
9.	Does the College organize any workshops/ seminars/ campaigns to educate students and staff?	Yes, the College is involved in these activities.
10.	Does your machinery (TV, AC, Computer, printers, etc.) run on standby modes most of the time?	Yes, in practice.

The following is estimate of Energy Consumption Annually: -



Energy consumption	Average (2022-23) kWh
Jan	1142
Feb	1728
Mar	1376
Apr	2724
May	2498
Jun	2608
Jul	4167
Aug	3208
Sep	2346
Oct	3729
Nov	2260
Dec	1902

Total Annual Energy Consumption: - 34,000 kWh (average of last two years)

Peak Contract demand = 23.3kW

Installed Solar PV Capacity = 21kW

Potential Energy generation = 32,900kWh

RESULTS

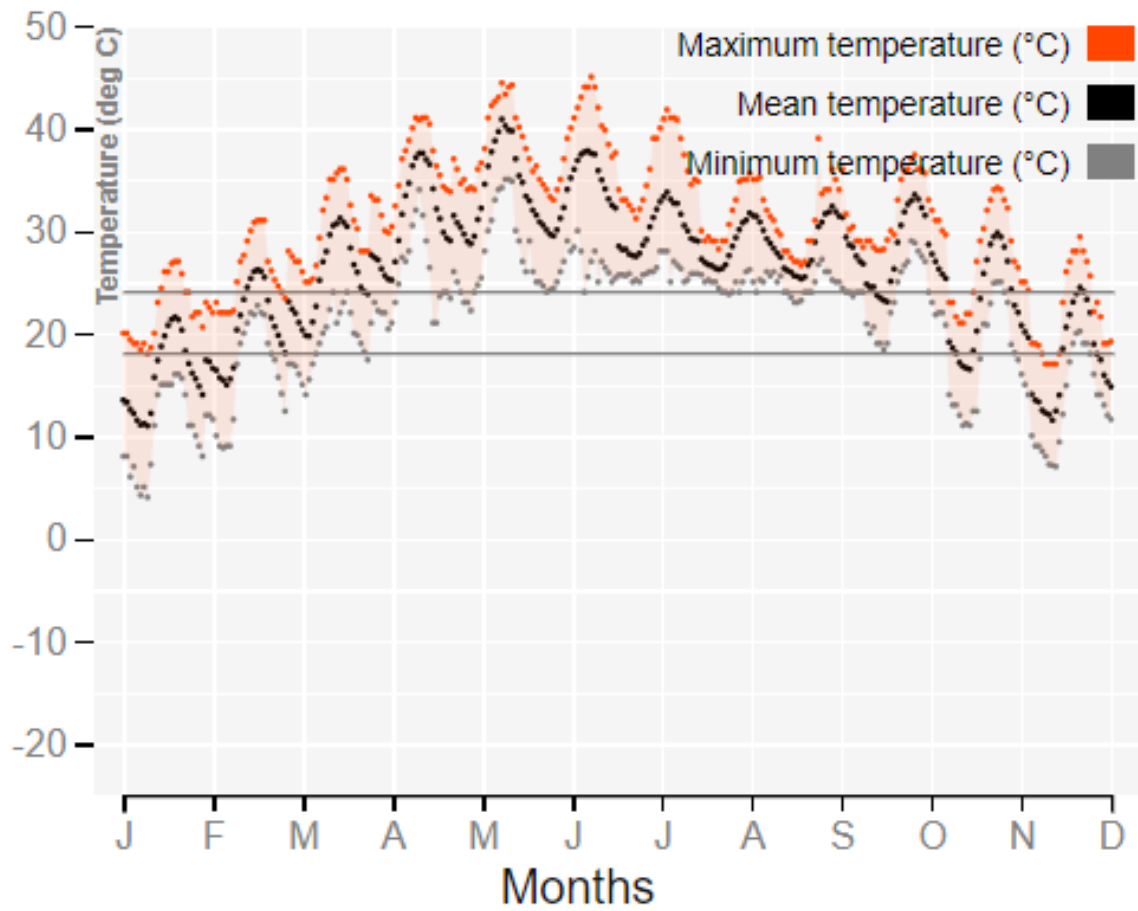
Print Results

32,968 kWh/Year*

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)
January	5.37	2,619
February	6.14	2,621
March	6.95	3,155
April	7.14	3,052
May	6.88	3,038
June	6.22	2,727
July	5.32	2,497
August	5.41	2,539
September	6.10	2,769
October	6.07	2,831
November	5.61	2,605
December	5.15	2,514
Annual	6.03	32,967

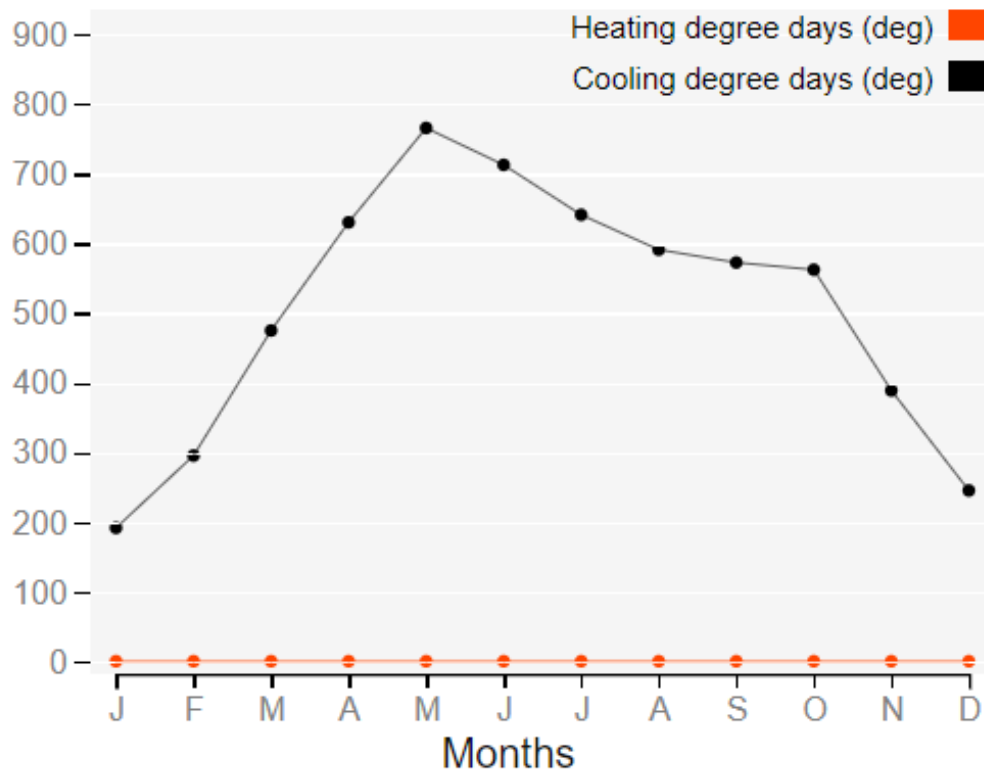
CLIMATE ASSESMENT OF JAIPUR

1. Outdoor Weather

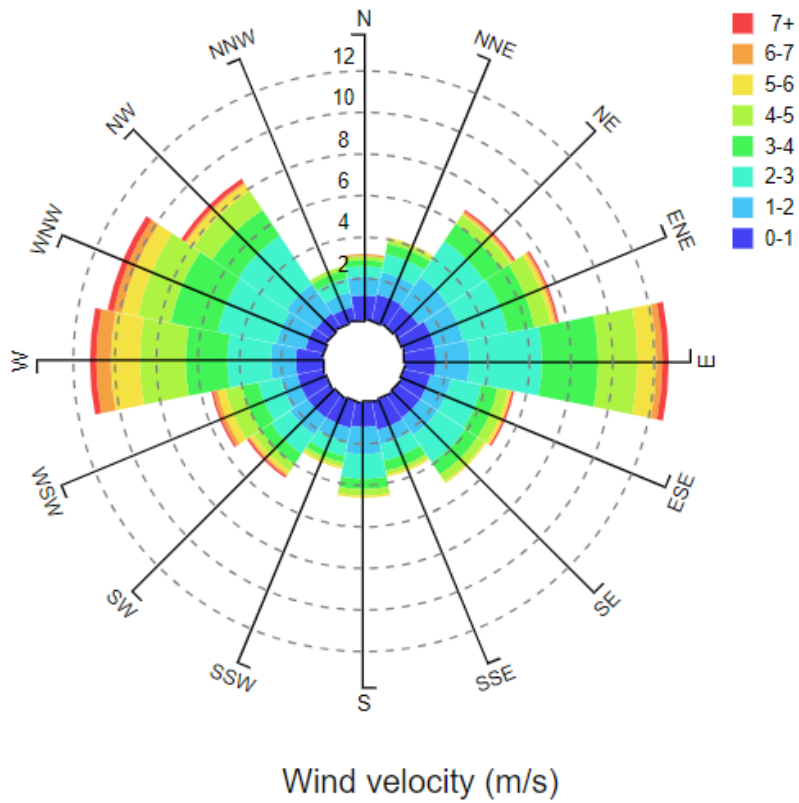


Hourly heating and cooling degree days for each month

HDD in the year - 0 CDD in the year - 6069



Frequency of wind directions and velocities for the whole year or selected hours during the year



The ***SRL Saharia College*** uses energy for electricity (Lights, Fans, ACs, Computers, Security Camera, Microwave, Refrigerators), and others. The energy saving methods employed in the College such as energy saving drives using posters for saving energy displayed.

More than 80% of the college buildings are naturally ventilated and comfortable due to ceiling fans and Operable windows. Certain labs and Video conference rooms are air conditioned. Installed air conditioners can be upgraded to 5 Star Invertor Acs.

The refrigerators and most of the equipment in the laboratories also have star ratings with less energy consumption. ***SRL Saharia College*** has given much importance to the use of renewable energy sources.

The awareness on energy conservation was regularly conveyed to staff and students to make them more responsible. Small activities like switching off lights, fans and computers not in use were completely practiced by all the members of College. The temperature of the air conditioners in the campus was set at 24°C during peak summer to reduce energy consumption without affecting the comfort. The day scholar students and staff are mostly relying on the public transport services i.e. buses for their transportation which saves the fuel consumption and also reduces the carbon emissions from private vehicles. This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. An old incandescent bulb uses approximately 60W to 100W while an energy efficient light emitting diode (LED) uses only less than 10 W. Moreover the classrooms are designed with adequate daylight and windows for cross ventilation.



Figure 1- Classrooms- Use of electricity for interactive display



Figure 2- Classrooms with adequate daylight



Figure 3- Use of LED Lighting in Classrooms





Figure 4- Installed Solar PV of 21k

RECOMMENDATIONS

- The SRL Saharia College replace all Lights with LEDs
- Replace all Fans with BLDC fans for energy savings.
- Consider upgrading to 5 star inverter ACs for new blocks and renovations.
- Install a digital submeter for monitoring consumption of each building and Solar PV generation separately.
- More energy efficient air conditioners and coolers should be used in the College campus.

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