Report

On

GREEN, ENERGY & ENVIRONMENT AUDIT

For

Lala Lajpat Rai College of Law
Mahalakshmi, Mumbai

Prepared

By

Senergy Consultants Pvt Ltd
Mumbai

April – 2025

Helping You to Conserve Energy

Contents

I
Introduction

Green & Energy Audit was undertaken at Lala Lajpat Rai College of Commerce and Economics, Lala Lajpat Rai Marg, Haji Ali Government Colony, Mahalakshmi, Mumbai, Maharashtra 400034 during the month of April 2025.

The organization is very keen to promote green culture wherever possible, as a commitment towards a better environment and conservation of energy. A lot of effort has already been put up to bring down the carbon footprint. To further optimize consumption and identify saving opportunities, M/s Senergy Consultants was assigned to carry out Green & Energy Audit of the premises.

This Audit Report presents the analysis of the data collected, observations made at the facility and is governed by the objectives, scope of work, methodology etc. discussed in the ensuing paragraphs.

Team:

The team members of the audit study.

- Mr. Ravindra Datar
- Mr. Nitesh Kharche
- Mr. Chaitanya Rakh
- Mr. Vikas Kharatmol

Acknowledgment:

We wish to express our gratitude towards Dr. Neelam Arora (Principal) for having given us the opportunity to conduct the study and the support provided during the study.

We are also thankful to Ms. Kranti Indurkar (Co-Ordinator) for extending necessary help and co-operation from their side.

II
Executive Summary

The premises were evaluated against the various criterions laid down by the National Assessment and Accreditation Council (NAAC). The major observations are.

Air Quality & Ventilation

- The classrooms and other areas are well ventilated to ensure proper air quality.
- The fans are appropriately installed to ensure proper air circulation.
- Indoor as well as outdoor plants have also been provided to improve the environment.
- The air-conditioned rooms are provided with proper ventilation and fresh air.

Lighting System

- The usage of natural light is optimized through well designed structure and windows.
- There is sensor-based lighting control in the washrooms to automate switching of lights.
- Most of the light fittings are provided with high efficiency LED lamps.
- The conventional tube lights operating for longer periods should be replaced with energy-efficient LED lamps.

Green Campus Initiative

- The movement of vehicles inside the campus is restricted with vehicles of Staff and Special Dignitaries are allowed to enter the campus with designated parking area.
- The usage of plastic is completely banned inside the campus.
- The campus is surrounded by a lot of greenery, trees, and proper landscaping.
- Bicycles are allowed in campus movement as required.

Environment & Energy Initiative

- The college has formed internal committees and the Green Club for promoting environmental and conservation activities.
- In an effort further environmental sustainability, the college Green Club held a medicinal plant plantation drive on December 5, 2024.
- Green Consumerism, Pollution control & Green Entrepreneurship workshops are conducted to create awareness related to the environment.

Water Quality & Conservation

- The water is supplied by the Municipal Corporation, which is a common practice in Mumbai, Thane & Navi Mumbai.
- Water purifiers & coolers are provided at convenient locations and on each floor.
- For conversation of water, college has installed the waterless urinal.
- The distribution network and piping are satisfactory and adequate.
- The rainwater harvesting pit is provided for ground water recharge.

Waste Management

- The sewage / effluent water is discharged in the common municipal drain, which is a common practice in and around Mumbai & Navi Mumbai.
- The general solid waste is disposed through municipal corporation.

Air Conditioning System

- The Air Conditioners are operated as required with manual control. The operation is minimal consequently automation may not be economical.
- The room temperature is maintained at 24 to 25 ^{o}C, which is well within the recommended values.
- The Air Conditioners are serviced regularly and properly maintained.
- Most of the Air Conditioners units are energy efficient with star rating of 3 and above.

Infrastructure usage

- The special toilet is available to address the needs of specially abled people.
- Ramps are provided on the ground floor to address the needs of specially abled people.
- There were no seepages observed in the building premises.
- The on-campus movement is distributed with multiple entrances as well as staircases.
- There is adequate fire extinguishers located at key areas.
- The draining system for washrooms is efficient and effective.

Green IT culture

- Energy efficient computers and laptops have been procured.
- Electronic communication is encouraged to minimize usage of papers.
- Most of the papers are reused for doubled sided printing to further minimize usage of paper.

Renewable Energy

- The Solar Photovoltaic System with NET metering is available to meet part of the electricity consumption.
- The quantity of plate waste (organic waste with higher starch contents) is negligible, consequently, there is no potential for biogas generation.

III
Electrical Gadget

Lamps:

Sr No.	Location	Quantity
Second Floor		
1	Unaided Office	12
2	Accounts	5
3	Principal	10
4	Trustees Cabin	24
5	Classroom 205	12
6	Classroom 206	14
7	Classroom 207	9
8	Passage Area	8
9	Girls Common Room	15
10	Library	72
Fourth Floor		
11	Classroom 401	7
12	Classroom 402	8
13	Classroom 403	7
14	Classroom 405	7
15	Classroom 406	9
16	Classroom 407 Computer Lab	4
17	Classroom 408	10
18	Staff Room	12
19	Exam Room	2
20	Hod Office	4
21	UGC Room 409	6
23	Girls Washroom	1
24	Ladies Washroom	1
25	Gents Washroom	1
Total		**260**

Abbreviations:
LED: Light Emitting Diode Lamp

Observations and Recommendations:

- The illumination level is generally as per the norms; the illumination level is higher mainly due to usage of daylight.
- The use of daylight has been maximized through windows.
- The lamps are strategically located to optimize usage of daylight.
- The practice of switching off the lamps in the unoccupied areas has been followed.

- Almost all the light fittings are provided with high efficiency LED lamps.

Ceiling Fans:

Sr No.	Location	Celling Fans
Second Floor		
1	Unaided Office	3
2	Accounts	2
3	Principal	1
4	Trustees Cabin	4
5	Classroom 205	6
6	Classroom 206	3
7	Classroom 207	8
8	Passage Area	1
9	Girls Common Room	4
10	Library	32
Fourth Floor		
11	Classroom 401	9
12	Classroom 402	6
13	Classroom 403	6
14	Classroom 405	9
15	Classroom 406	7
16	Classroom 407 Computer Lab	3
17	Classroom 480	9
18	Staff Room	5
19	Exam Room	1
20	Hod Office	2
21	UGC Room 409	4
22	Girls Washroom	4
23	Boys Washroom	3
24	Ladies Washroom	1
Total		**133**

Observations:

- The fans are switched off, when not in use.
- It is suggested to procure energy efficient fans with High Efficiency Fans with BLDS Motors / or fans with 5-star rating while making new purchases.

Air Conditioners:

Sr No.	Lab Name	Floor	Type	Quantity
1	Principal Madam Office	Second	Window	1
2	Trustee Cabin	Second	Window	1
3	Secretary	Second	Window	1
4	Classroom	Second	Window	9
5	Accounts	Second	Window	1
6	Unaided office	Second	Window	2
7	Library	Second	Split and window	7
8	Girls Common Room	Second	Window	2
9	Exam Room	Fourth	Window	1
10	Exam Room	Fourth	Window	1
11	Staff Room	Fourth	Window	3
12	IQAC Room	Fourth	Split	1
13	Computer Lab	Fourth	Window	2
14	UGC Room -Jagdish Cabin	Fourth	Split and window	3
15	Staff Room	Fifth	Window	3
Total				**38**

Observations:

- The air conditioners are switched off, when not in use.
- The hall temperature was observed to be 24 to 25 ^{o}C; which are standard values.
- The overall condition of indoor as well as outdoor units is satisfactory.
- It is suggested to procure energy efficient machines of 5-star rating while making new purchases.

Electricity Bill:

Consumer Name: Principal L.L College of C & E					**Consumer No.- 235-600-018-0**			
Tariff Category: LT IV B		**Maharashtra State Electricity Distribution Co. Ltd.**						
Meter No.: S192021		Contract Demand: 16.25 kVA						
Description	**Unit**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Feb-25**	**Mar-25**	**Average**
Energy Consumption	KWH	250	286	212	152	97	124	186.8
Bill	Rs	3421.7	3831.6	2988.9	2305.7	1679.4	1539.7	2627.8
Cost	Rs/KWH	13.69	13.40	14.10	15.17	17.31	12.42	14.06

Consumer Name: Lala Lajpat Rai Memorial Trust					**Consumer No.- 202-028-593-7**	
Tariff Category: LT IVB-T		**Maharashtra State Electricity Distribution Co. Ltd.**				
Meter No.: P2151697		Contract Demand: 43.75 kVA				
Description	**Unit**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Average**
Energy Consumption	KWH	4196	4262	3894	4582	2822.3
Bill	Rs	49251.6	50149.8	45975.2	53572.9	32588.8
Cost	Rs/KWH	11.74	11.77	11.81	11.69	11.54

Consumer Name: Principal Lala Lajpat Rai College					**Consumer No.- 685-308-001-0**			
Tariff Category: LT IVB-T		**Maharashtra State Electricity Distribution Co. Ltd.**						
Meter No.: P2151697		Contract Demand: kVA						
Description	**Unit**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Feb-25**	**Mar-25**	**Average**
Energy Consumption	KWH	80	96	69	83	87	81	82.6
Bill	Rs	1470.8	1652.9	1343.6	1469.8	1586.8	920.6	1407.4
Cost	Rs/KWH	18.39	17.22	19.47	17.71	18.24	11.37	17.02

Consumer Name: Principal L.L College of C & C					**Consumer No.- 202-002-443-1**	
Tariff Category: LT II C		**Maharashtra State Electricity Distribution Co. Ltd.**				
Meter No.: T111482		Contract Demand: 356.25 kVA				
Description	**Unit**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Average**
Energy Consumption	KWH	32760	42360	28680	23880	21280.0
Bill	Rs	367908.6	451776.9	327411.0	283965.5	255966.1
Cost	Rs/KWH	11.23	10.67	11.42	11.89	12.02

Consumer Name: Principal L.L College of C & C					**Consumer No.- 202-028-575-5**	
Tariff Category: LT II B		**Maharashtra State Electricity Distribution Co. Ltd.**				
Meter No.: P151085		Contract Demand: 25.60 kVA				
Description	**Unit**	**Oct-24**	**Nov-24**	**Dec-24**	**Jan-25**	**Average**
Energy Consumption	KWH	783	911	783	795	545.3
Bill	Rs	12486.1	13756.2	12476.1	12612.7	9533.3
Cost	Rs/KWH	15.95	15.10	15.93	15.87	17.48

Observations:

- The average power cost and power consumption is generally within the normal range.

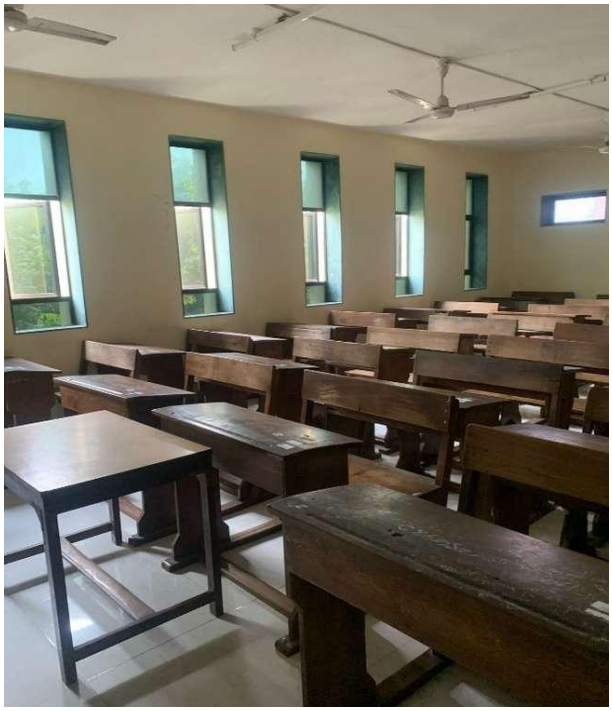
IV
Environmental System

Ventilation & Air Quality:

- The air ventilation is adequate.
- Several indoor & outdoor plants have been installed to improve air quality.




- Many of the lamps are replaced with LED, especially those working for longer period.
- Natural light is been used for maximum illumination during daytime.
- It has been general practice to switch off the fans & lights in an occupied area.



Indoor & Outdoor Plants:

Sr No	Common Name	Scientific Name
1	Dilleniaceae	Dillenia Indica (Elephant Apple)
2	Mangoliaceae	Michelia Champaca (Sonchampa)
		Mangolia Cocoa (Egg Mangolia)
3	Annonaceae	Annona Squamosa (Sitaphal)
		Annona Reticulata (Ramphal)
		Artabotrys Hexapetalus (Green Champa)
		Polyalthia Longifolia (False Ashok)
4	Menispermaceae	Tinospora Cordifolia (Gulvel)
		Cocculus Hirsutus
5	Bixaceae	Bixa Orellana (Annatto, Shendri)
6	Portulacaceae	Talinum Fruticosum (Ceylon Spinach)
7	Clusiaceae (Guttiferae)	Mesua Ferrea
8	Dipterocarpaceae	Dipterocarpus
9	Malvaceae	Hibiscus Rosa-Sinensis
10	Bombacaceae	Ceiba Pentandra
11	Sterculiaceae	Theobroma Cocoa

Sr No	Common Name	Scientific Name
12	Geraniaceae	Pelargonium Geranium
13	Averrhoaceae	Averrhoa Carambola
14	Oxalidaceae	Oxalis Corniculata
15	Rutaceae	Murraya Koenigii
		Citrus
16	Simaroubaceae	Ailanthus Triphysa
17	Burseraceae	Commiphora Wightii
18	Meliaceae	Azardirachta Indica
19	Icacinaceae	Nothapodytes Foetida
20	Vitaceae	Vitis Vinifera
21	Sapindaceae	Nephelium Chinensis
22	Anacardiaceae	Mangifera Indica
23	Papillionaceae	Pterocarpus Santalinus
24	Cesalpinaceae	Bauhinia Purpurea
25	Mimosaceae	Albizia Lebbeck
26	Hydrangeaceae	Hydrangea Macrophylla
27	Crassulaceae	Bryophyllum Pinnatum
28	Combretaceae	Terminalia Arjuna
29	Myrtaceae	Syzygium Cumini
30	Lecythidaceae	Barringtonia Racemosa
31	Melastomaceae	Memecylon Umbellatum
32	Lythraceae	Lagerstroemia Speciosa
33	Cucurbitaceae	Coccinea Grandis
34	Caricaceae	Carica Papaya
35	Cactaceae	Opuntia
36	Apiaceae	Eryngium Foetidum
37	Araliaceae	Schefflera Arboricola
38	Rubiaceae	Mitragyna Parvifolia
39	Asteraceae	Wedelia Chinensis
40	Goodeniaceae	Scaevola Sericea
41	Plumbaginaceae	Plumbago Zeylanica
42	Sapotaceae	Mimusops Elengi
43	Oleaceae	Jasminum Laurifolium
44	Salvadoraceae	Salvadora Persica
45	Apocynaceae	Catharanthus Rosea
46	Asclepidaceae	Hemidesmus Indicus
48	Bignoniaceae	Mansoa Alliacea
49	Acanthaceae	Andrographis Paniculatus
50	Verbenaceae	Vitex Negundo

V
Water Management

Water Source:

The water supplied by the municipal corporation is used only for drinking & Well water is used for other applications like toilets, washing of utensils and other requirements.

The incoming water from the municipal corporation is metered.

The consumption pattern was analyzed by the water bills. The details are as under.

Period	Days	Consumption	Bill Amount	Cost	Total No. of Person	Water Consumption
		KL	Rs	Rs/KL		L/Person/Day
Connection No- GS@0002740						
26-03-2024 to 28-06-2024	90	333	11514	34.58	4592	0.81
28-06-2024 to 30-09-2024	90	333	11342	34.06	4592	0.81
30-09-2024 to 31-12-2024	90	343	12222	35.63	4592	0.83

Period	Days	Consumption	Bill Amount	Cost	Total No. of Person	Water Consumption
		KL	Rs	Rs/KL		L/Person/Day
Connection No- GS@0002738						
26-03-2024 to 28-06-2024	90	394	13979	35.48	4592	0.95
28-06-2024 to 30-09-2024	90	394	13979	35.48	4592	0.95
30-09-2024 to 31-12-2024	90	458	17368	37.92	4592	1.11

Period	Days	Consumption	Bill Amount	Cost	Total No. of Person	Water Consumption
		KL	Rs	Rs/KL		L/Person/Day
Connection No- GS@0002726						
26-03-2024 to 28-06-2024	90	103	11317	109.87	4592	0.25
28-06-2024 to 30-09-2024	90	99	10884	109.94	4592	0.24
30-09-2024 to 31-12-2024	90	101	11096	109.86	4592	0.24

Period	Days	Consumption	Bill Amount	Cost	Total No. of Person	Water Consumption
		KL	Rs	Rs/KL		L/Person/Day
Connection No- GSA9300003						
26-03-2024 to 28-06-2024	90	2768	20954	7.57	4592	6.70
28-06-2024 to 30-09-2024	90	4159	36037	8.66	4592	10.06
30-09-2024 to 31-12-2024	90	3801	31345	8.25	4592	9.20

Observations:

- The consumption is generally within the norms.

Water Coolers & Purifiers:

Water purifiers & coolers are provided at individual floors and in convenient locations, the details are as under.

Sr No.	Floor	Total
1	Second	1
2	Fourth	2
Total		**3**

Rainwater Harvesting:

The rainwater is harvested in a pit & there is a provision to recharge the ground water or use rainwater.

VI
Waste Generation & Management

Sewage & Wastewater:

The sewage is fed into the municipal drainage. This is a common practice and the municipal corporation which charges towards the sewage charges.

Solid Waste:

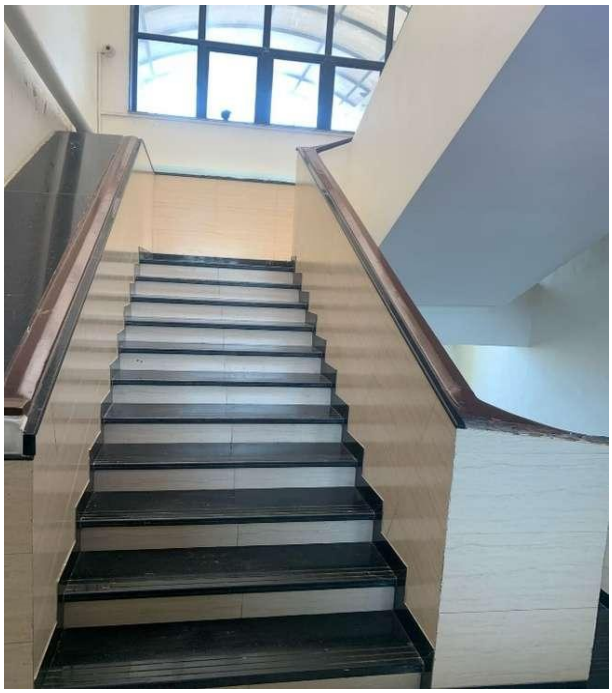
- The waste is segregated and disposed of through the municipal disposal system.
- The dustbins for Recyclable waste and Non-Recyclable Waste have been provided at appropriate locations.
- There is no availability of organic waste in the campus.

- The electronic gadgets with residual life may be donated while the electronic waste is properly segregated and handed over to appropriate scrap collectors.

VII
Infrastructure & Safety

Movement on-campus (Distributed / non-distributed leading to crowds)

- The premises are provided with multiple staircases with necessary entrances to ensure quick and effective movement in normal as well as emergency conditions.



- The movement of vehicle inside the campus is restricted with vehicles of Staff and Special Dignitaries are allowed to enter the campus with designated parking area.
- There is a complete ban on plastic usage inside the campus.
- Ramp is available for differently abled student along with special toilet dedicated for them.

Parking space:

There is adequate parking space for vehicles/four wheelers. However, only Management members available public transport system which is very convenient due to proximity to railway station and bus services.

Firefighting & fire escape system:

There are efficient fire extinguishers in the premises; which are checked / refilled as per the stipulated frequency.

The premise is provided with multiple staircases with requisite entrances to ensure quick and effective movement in emergency conditions.

Draining system:

The drains from the washrooms are connected to the municipal drainage, which is a common practice in the colleges in and around Mumbai.

The municipal corporation charges for water disposal.

Seepage in the building:

The premise was visually inspected for seepages.

No seepages were observed in any of the places.

VIII
Green Culture

Computers/Laptops:

1. The LED / LCD monitors & Laptops has been procured, which are energy efficient.

2. These monitors are not only energy efficient but also generate minimal heat and cut down on air conditioning load.

The following steps may be initiated to further enhance efficiency of the systems.

1. An efficient power management system may be incorporated to
    a. Switch off the display if not in use.
    b. Put the computer in Sleep mode / switching off the machines, if not used for prolonged period.

2. Optimize brightness of the screen.

3. Discourage use of screen savers, which has similar power consumption.

Paper-less communication:

The major internal as well as external communication is through electronic medium.

Re-using one sided paper for printing:

It was observed that two side printing / printing on the back side of used paper in more than 80% of the cases.

IX
Renewable Energy

Solar Photovoltaic:

The college has installed roof-top solar photovoltaic system with net metering facility.

Solar Thermal:

There is no application of solar thermal system and does not find attractive in this case

Biogas Plant:

There is no possibility of installing a biogas plant for cooking as the quantity of plate waste is negligible.