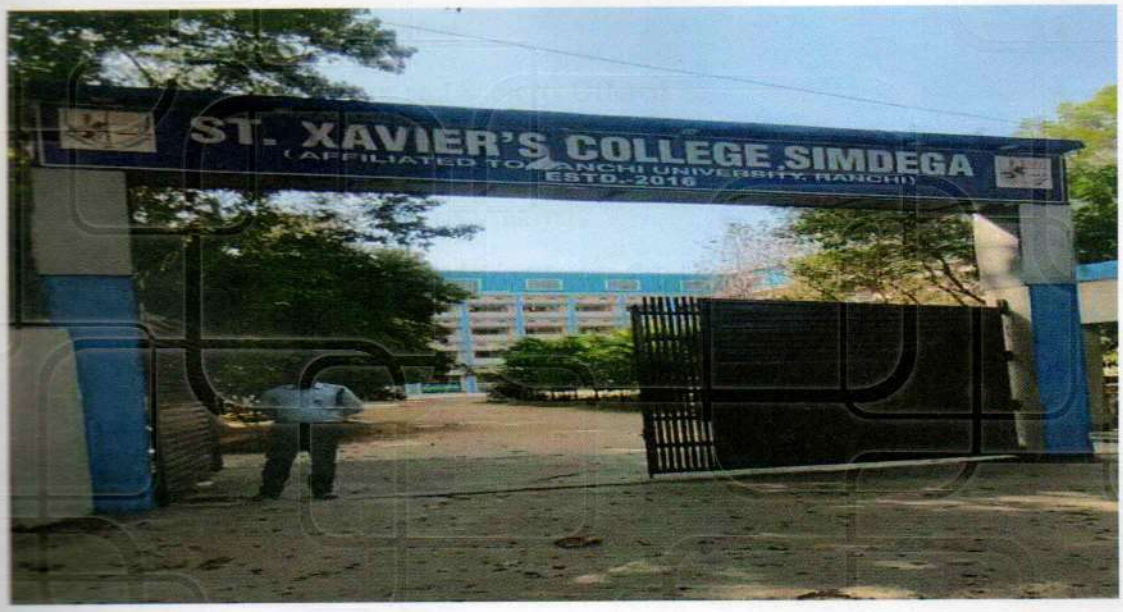
Energy Audit Report
For
St. Xavier's College, Simdega, Jharkhand



Submitted To

St. Xavier's College, Simdega

Environmental Laboratories & Engineering Services Pvt. Ltd.

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ISO 9001:2015 Certified, OHSAS: 2007 Certified
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Index

Index of Figures

Index of Tables

ACKNOWLEDGEMENT

The task of performing an energy audit of the campus has been given to Environmental Laboratories & Engineering Services Pvt. Ltd. (ELESPL), Ranchi by St. Xavier's College, Simdega as part of their green effort.

ELESPL hereby express sincere thanks to the following officials of St. Xavier's College, Simdega for their proactive support and courtesy extended to the energy audit team during field study.

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1. About the Site

1.1 Introduction:

The Ranchi Jesuit Society (Jesuits) established "ST. XAVIER'S COLLEGE, SIMDEGA," a Catholic Minority Educational Institution of Higher Education. Its main goal is to give tribal students and the region's marginalized majority access to a Christian university education that fosters their intellectual, social, and spiritual development on all levels. It belongs to the "XAVIERS RANCHI" society, which is registered under the Society's Registration Act XXI of 1860 (No. 198/2005-2006 Jharkhand, No. 13/1958-59 Bihar).It is currently situated on the site of St. John Berchmans Apostolic School Samtoli. St. Francis Xavier, the college's patron saint and one of the original members of the Society of Jesus, is honored by the college's name. With 454 students enrolled in two undergraduate courses in arts and commerce, it began operations on August 1st, 2016. It is associated with Ranchi University in Ranchi, Jharkhand, and students who pass the university's exams will receive degrees from the institution.

St. Xavier's College, Simdega, is a premier institution of higher education in Jharkhand, dedicated to academic excellence and holistic development. Established with the vision of providing quality education to students in the region, the college is affiliated with Ranchi University and is managed by the Jesuit Society, known for its commitment to intellectual and moral growth.

With a strong emphasis on values-based education, St. Xavier's College, Simdega, offers undergraduate and postgraduate programme in arts and commerce, fostering an environment of learning and research. The institution is equipped with modern infrastructure, well-qualified faculty, and a vibrant campus life that promotes both academic and extracurricular excellence.

Rooted in the Jesuit tradition of education, the college strives to nurture responsible citizens who contribute meaningfully to society. Through its commitment to discipline, ethical values, and social service, St. Xavier's College continues to be a center of knowledge and leadership development in the region.

1.2 Geographical Positioning: The college has a pollution free campus and situated in Samtoli, approximately 2 kilometers west of the Simdega Bus Stand, in the Simdega district of Jharkhand, India. College lies at 22°37'08" N Latitude and 84°28'49" E

longitude. The college currently operates on a campus spanning approximately 5.00 acres. It covers an area of playground, parking and greenery. Buildup area in the campus is around 0. 25 acres.

Figure 1: Total Campus Area

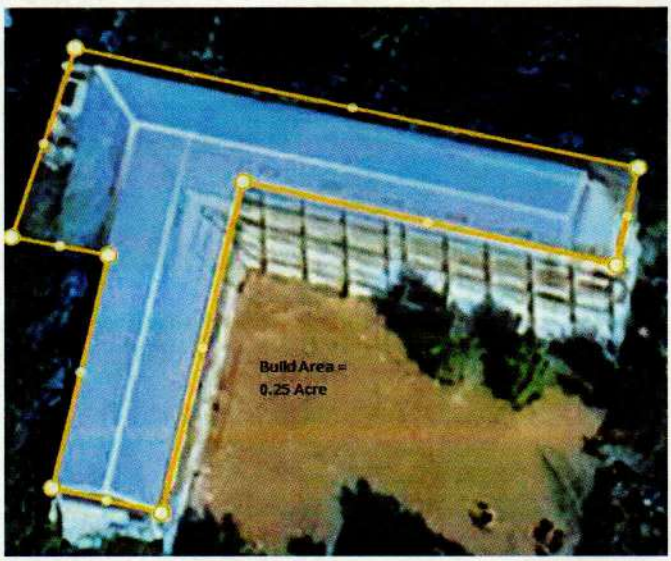


Figure 2: Total Buildup Area

1.3 Academic Programs and Subjects Offered: St. Xavier's College offers undergraduate programs in the Arts and Commerce streams. The subjects available for study include:

- **Bachelor of Arts :**
  - English
  - Hindi
  - Economics
  - History
  - Political Science
  - Geography
- **Bachelor of Commerce :**
  - Accounts

These programs are designed to provide a comprehensive education, fostering both academic and personal growth among students.

Student Strength: As of the latest available data, the college has a total enrollment of approximately 1,451 students, supported by faculty strength of 25 members.

St. Xavier's College, Simdega, continues to uphold its commitment to providing quality education and holistic development opportunities to its students.

Figure 3: Main Building

Figure 4: Computer Room

Figure 5: Library

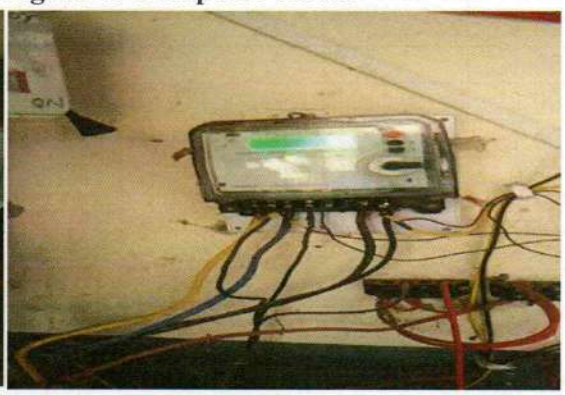


Figure 6: College Meter

Figure 7: College Campus

Figure 8: College Protected Area

Figure 9: Air Sampling Station

Table 1: Land Use Breakup			
Units	Area (Sq. m)	Area (Acres)	Percentage Area
Educational Installments	930.78	0.23	4.60
Hockey Ground	4370.61	1.08	21.60
Football Ground	4653.89	1.15	23.00
College Ground	323.75	0.08	1.60
Protected Area	121.41	0.03	0.60
Canteen/Guard Room	40.52	0.01	0.20
Green Land	5746.536	1.42	28.40
Parking	445.21	0.11	2.20
Road	404.58	0.1	2.00
Open Area	3197.017	0.79	15.80
Total	20234.303	5.00	100.00

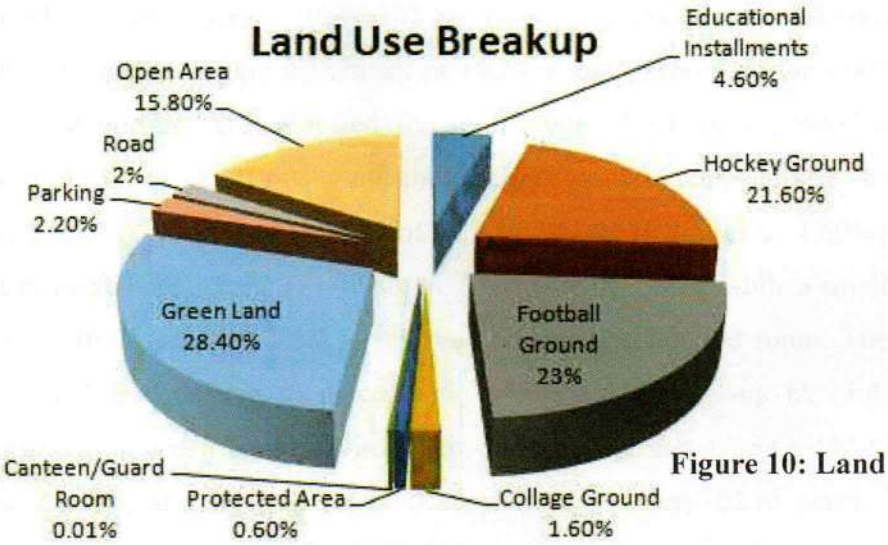


Figure 10: Land Use Breakup

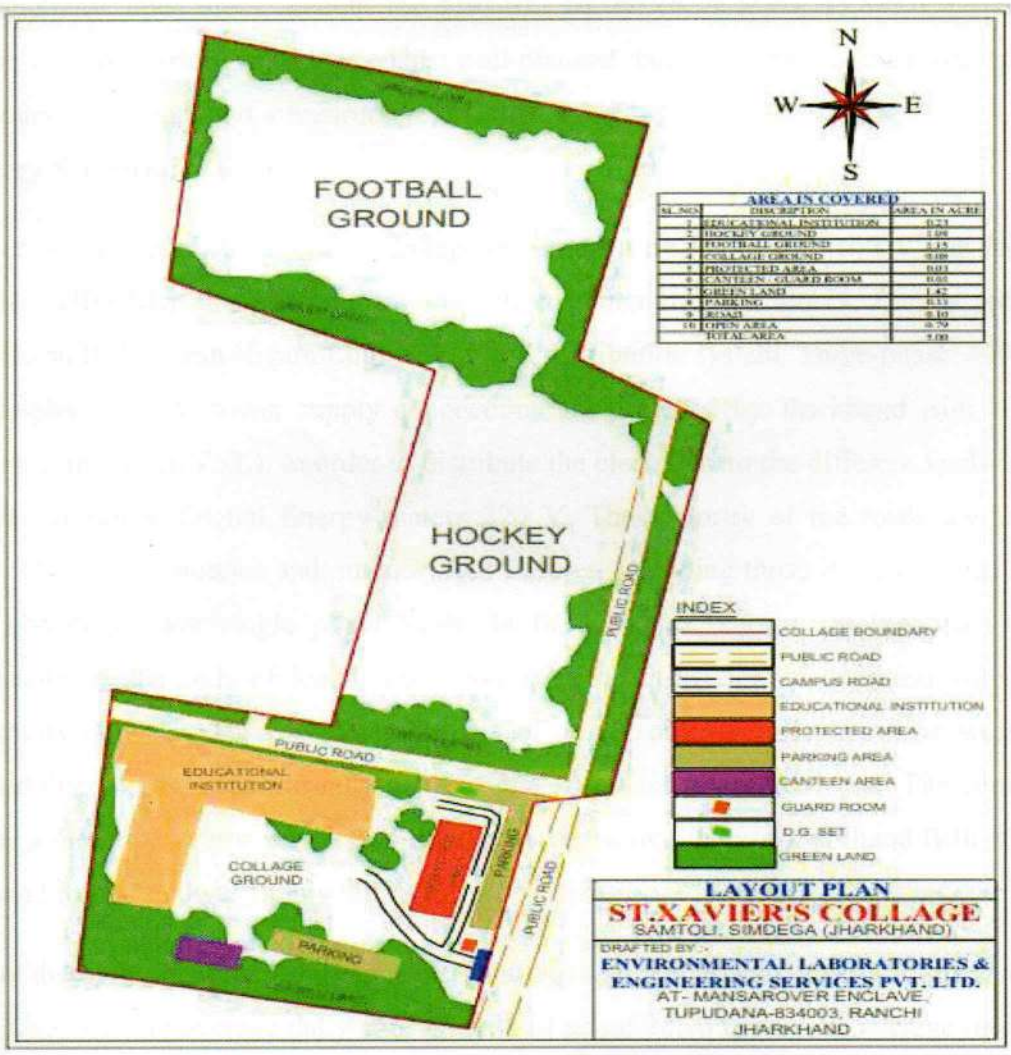


Figure 11: Land Use map of College Campus

The total land area of 5 acres (20234.303 sq. m.) is distributed across various uses. Educational installments occupy 930.78 sq. m. (0.23 acres), accounting for 4.60% of the total area. Large portions are allocated for sports, with the hockey ground covering 4370.61 sq. m. (1.08 acres, 21.60%) and the football ground taking up 4653.89 sq. m. (1.15 acres, 23.00%). A college ground of 323.75 sq. m. (0.08 acres, 1.60%) is also included. A protected area spans 121.41 sq. m. (0.03 acres, 0.60%), while a small section of 40.52 sq. m. (0.01 acres, 0.20%) is reserved for a canteen/guard room. The largest share of the land is dedicated to green land, covering 5746.536 sq. m. (1.42 acres, 28.40%), ensuring an eco-friendly environment. Parking facilities take up 445.21 sq. m. (0.11 acres, 2.20%), and internal roads occupy 404.58 sq. m. (0.10 acres, 2.00%). Additionally, open areas account for 3197.017 sq. m. (0.79 acres, 15.80%), providing flexibility for various activities. This well-planned land distribution balances sports, greenery, education, and infrastructure effectively.

2. **Energy Scenario:**

Power is supplied to St. Xavier's College in Simdega by Jharkhand Bijli Vitran Nigam Limited (JBVNL) at a single location with customer number 49879. Cables provide Jharkhand Bijli Vitran Nigam Limited's 05 KV distribution system. Three-phase, 440V to single-phase, 220V power supply connections are provided by Jharkhand Bijli Vitran Nigam Limited (JBVNL). In order to distribute the electricity to the different loads in the college complex, Digital Energy meters 220 V. The majority of the loads are single phase. Numerous interior and outdoor light fixtures, including those in classrooms, labs, and corridors, have single phase loads. In the complex, cables are used to supply electricity to all kinds of loads. There has been no utilization of overhead wires for electricity delivery. There were no reports of power outages brought on by weather-related disruptions, which usually happen when there is an overhead line. The complex keeps a diesel generator set up as a backup power source in case Jharkhand Bijli Vitran Nigam Limited's power supply fails.

Entire distribution system of the complex is studied. The contract demand for the campus is 7 KVA with an average daily consumption of about 28.16 units. The average monthly energy bills are about 864 units. The average monthly energy is about Rs. 5996.67/-. The

average power factor for the campus is 0.85 which is on the lower side. The peak operating hours of the campus is about 8 hrs per day.

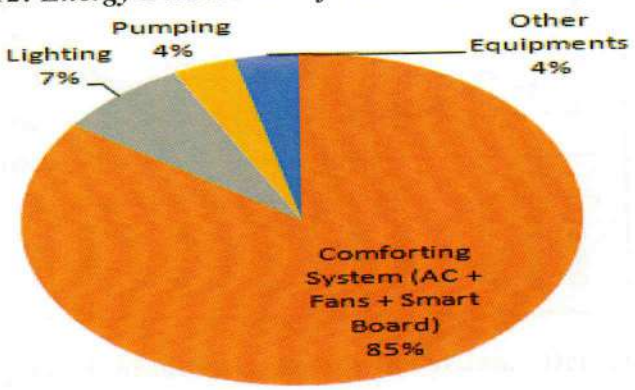
The output of transformer is fed to LT panels which bus coupling arrangement. To these panels a 15 KVA DG set is connected as stand by provision in emergency.

Table 2 : Energy Fact File of St. Xavier's College, Simdega	
Location	St. Xavier's College, Simdega
Areas of Utilization of Energy	Classrooms, Labs, Offices, Canteen and Library etc
Sources of supply	11 KVA Grid substation of Jharkhand Bijli Vitran Nigam Limited
Total contract Demand	5 KVA
Major Loads	Lighting, Air conditioning and Smart Board
Usage Hours	7-8 Hrs.
Monthly Energy Consumption	Avg. 684 kWh Per month
Monthly electricity Bill	Avg. Rs. 5997 Per month

The overall monthly energy consumption of the campus is estimated below, which includes the electricity unit drawn from the grid and the solar plant installed in the campus, the breakup is shown below.

Table 3: Energy Distribution		
Area	Unit Consumption kWh	Percentage (%)
Comforting System (AC + Fans + Smart Board)	1017	85.13
Lighting	90	7.53
Pumping	43.641	3.65
Departmental Loads	44.044	3.69

Figure *12: Energy Distribution of ST. Xavier's College, Simdega*



3. Review of Preset Data & Analysis:

The energy bills details of St. Xavier's College, Simdega, Jharkhand having consumer number 49879 are furnished below:

Table 4: Details from Energy Bills	
Consumer Name and Address	St. Xavier's College, Simdega
Consumer No.	49879
Tariff	CS Urban (DS)
Supply Voltage	11 KV

The energy consumption of the facility is studied to understand and implement the energy saving measures and progress ahead in becoming an energy efficient facility and reduce the carbon footprints of premises. ELESPL studied the total price paid by St. Xavier's College; is shown below:

Table 5: Summery of electricity bill paid in Rs. Monthly	
January 2024	6441
February 2024	5393
March 2024	6748
April 2024	6778
May 2024	6570
June 2024	6600
July 2024	12663 (4221 Rs. for Each Months)
August 2024	
September 2024	
October 2024	5953
November 2024	5090
December 2024	9724

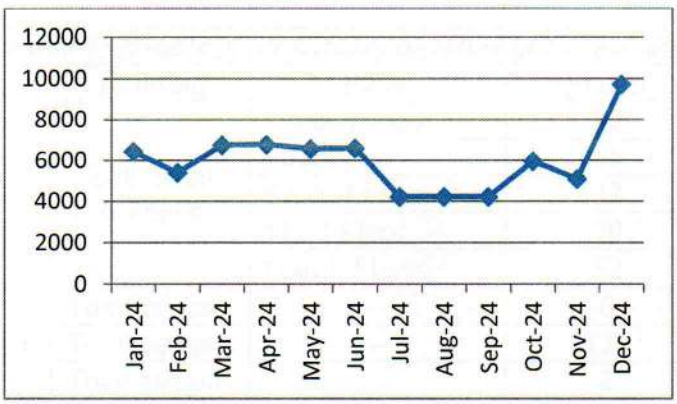


Figure 13: Month wise energy bill of Jan. - Dec. 2024

4. Lighting Inventory and major electrical loads:

Adequate and power lighting contributes both directly and indirectly towards productivity and safety, and towards providing an improved work atmosphere. In fact, all these are inter-related and complimentary to each other. There are several factors, which contribute towards proper lighting. It would be very difficult to deal with all of them when providing general illumination to a large area. However all efforts were made to study and include these factors during audit of St. Xavier's College, Ranchi for lighting loads.

To determine the quantity of lighting load a physical count of the light fitting in institute was carried out. Further, the inputs from the officials and maintenance log books were taken into consideration for calculating the inventory of total light fittings of the campus. The summarized indoor lighting installations of the main building other auxiliary buildings are furnished below.

The electrical load installed in the campus is also enlisted below.

Table 6: Details of lighting fixtures installed in the buildings

Building	Floor	Quantity		
		TL Watt	LED Watt	LED Watt
		36W	10W	24W
PG Building	Ground Floor	23	58	17
	First Floor	26	13	08
	Second Floor	01	05	38
	Third Floor	--	05	31
	Fourth Floor	--	01	70

Other than lighting the major electrical load is the air conditioning units, Fans, LED monitor Smart Board and other electric components in the campus. There is no window ACs in the campus.

Table 7: Details of all fixtures installed in the building

Type	Building	Floor	Quantity	W
Fans	Education Campus	Ground Floor	32	60
		First Floor	36	
		Second Floor	37	
		Third Floor	30	
		Fourth Floor	52	
Split ACs	Total campus	--	6	900
Desktop Computer	Total campus	--	121	85.2
Smart Board	Total campus	--	3	110
Other electric consumption	Total campus	--	--	44044.19

Apart from lighting and air conditioning, load is shared by pumping systems for water management wherein all the 1 borewells are less than 2 HP in capacity.

4.1 DG Set:

There are two diesel gensets installed to cater to the emergency power requirements of the campus. The two DGs are of different rating (10 KVA and 05 KVA). The 05 KVA DG set is standby and the other 10 KVA is in continuous operation based on the requirement.

It is observed that the power supply is mostly uninterrupted and there are no major power cuts thus DG sets are required for about 45 hrs (average) in month.

5. Estimation of Energy consumption:

ELES Pvt. Ltd., Ranchi visited the campus and did a walkthrough audit which helped them to understand the usage pattern and validate the data available/ provided by St. Xavier's College, Ranchi. The various sources of energy and areas of consumption has been studied during the energy audit.

5.1 Lighting System:

Table 8: Lighting load of St. Xavier's College, Simdega, Jharkhand

Building	Floor	Quantity			Load KW		
		TL Watt	LED Watt	LED Watt	TL 36W	LED 10W	LED 24W
		36W	10W	24W	KW	KW	KW
Main Building	Ground Floor	23	58	17	0.828	0.58	0.408
	First Floor	26	13	08	0.936	0.13	0.192
	Second Floor	01	05	38	0.036	0.05	0.912
	Third Floor		05	31	--	0.05	0.744
	Fourth Floor		01	70	--	0.01	1.680
Total		50	82	164	1.80	0.82	3.936

The table represents the lighting load distribution in the Main Building of St. Xavier's College, Simdega, Jharkhand. It provides details on the number of Tube Lights (TL) and LED lights installed on each floor, along with their respective power consumption. The building uses 36W Tube Lights, 10W LED lights, and 24W LED lights, with their energy consumption calculated in kilowatts (KW). The Ground Floor has 23 TL 36W, 58 LED 10W, and 17 LED 24W, consuming 0.828 KW, 0.58 KW, and 0.408 KW, respectively. The First Floor follows with 26 TL 36W, 13 LED 10W, and 8 LED 24W, consuming 0.936 KW, 0.13 KW, and 0.192 KW, respectively. The Second Floor primarily uses LED lights, having only 1 TL 36W, with 5 LED 10W and 38 LED 24W, leading to a total load

of 0.036 KW, 0.05 KW, and 0.912 KW, respectively. The Third Floor and Fourth Floor have fully transitioned to LED lights, with the Third Floor using 5 LED 10W and 31 LED 24W, consuming 0.05 KW and 0.744 KW, while the Fourth Floor has 1 LED 10W and 70 LED 24W, consuming 0.01 KW and 1.680 KW. The total lighting load for the building sums up to 6.556 KW, with TL 36W contributing 1.80 KW, LED 10W contributing 0.82 KW, and LED 24W contributing 3.936 KW. The data highlights a significant shift towards energy-efficient LED lighting, particularly on the upper floors, reducing overall energy consumption compared to traditional tube lights.

5.2 Fixtures Load

Table 9: Details of all fixtures Load in the St. Xavier's College, building Simdega

Type	Building	Floor	Quantity	W	Total KW	Energy Consumption KWH
Fans	Education Campus	Gr. Floor	32	60	1.920	3.84
		Ist Floor	36		2.160	4.32
		IInd Floor	37		2.220	4.44
		IIIrd Floor	30		1.800	3.6
		IVth Floor	52		3.120	6.24
Split ACs	Total campus		6	900	5.400	10.80
Desktop Computer	Total campus		121	85.2	10.309	20.62
Smart Board	Total campus		3	110	0.33	0.66
Other electric consumption	Total campus		--	--	44.044	44.044
Total					**71.303**	**98.56**

The table provides a detailed breakdown of the electrical load and energy consumption for various fixtures in St. Xavier's College, Simdega. It categorizes different electrical appliances, including fans, air conditioners (ACs), desktop computers, smart boards, and other general electrical consumption across different floors and the entire campus. The fan load is distributed across five floors of the education campus, with each fan consuming 60W. The total fan load across all floors is 11.22 KW, with the IVth floor having the highest consumption (3.12 KW, 6.24 KWh) due to 52 fans. The split ACs contribute significantly to the energy load, with 6 units consuming 5.4 KW and 10.8

KWh. The desktop computers, totaling 121 units, have a substantial load of 10.309 KW and 20.62 KWh due to their 85.2W power rating per unit. The smart boards, though fewer in number (3 units at 110W each), contribute 0.33 KW and 0.66 KWh. The largest power consumption comes from miscellaneous electrical usage, estimated at 44.044 KW and 44.044 KWh, covering lighting, charging, and laboratory equipment. Overall, the total connected load in the college is 71.303 KW, leading to an estimated daily energy consumption of 98.56 KWh (considering average 2 hrs of operation per days in a month).

6. Energy Conservation Measures (ECMs)

Considering the usual operational patterns as per the electrical loads, the total energy savings are estimated as tabulated below. It is expected that by implementing the below mentioned energy conservation measures, St. Xavier's College, Simdega, Jharkhand can reduce the power consumption of the campus and can also establish a better monitoring and management system which would help to act aggressively in energy consumption evaluators in the future.

6.1 Replacement of installed TLs with LEDs:

ELESPL observed that TLs are installed in some areas of the campus which lead to increase energy consumption and poor lumen, can be replaced with LEDs which will help to reduce the energy consumption and also provide better lumen in the area along with increased life. The calculation for energy saving is shown below.

Table 10: Energy Consumption and Saving estimated by replacement of TLs with LEDs

Building	Floor	Quantity	Load KW	Saving	Operating Hrs.	Monitoring Saving
		TL (36 W)	TL (36 W)	LED (12 W)	225 Days X 10 Hrs.	
		Number	KW	KW	Hours/Year	INR
Main Building	Ground Floor	23	0.828	0.552	2250	8706.42
	First Floor	26	0.936	0.624		9842.04
	Second Floor	01	0.036	0.024		0378.54
	Third Floor	--	--	--		--
	Fourth Floor	--	--	--		--
Total		50	1.8	1.2		18927.00

The table presents an estimation of energy consumption and savings resulting from the replacement of **36W tube lights (TLs) with 12W LEDs** in the **Main Building** across

different floors. It details the number of TLs installed on each floor, their corresponding power consumption (load in kW), and the power savings achieved after switching to LEDs. The calculation is based on **225 operational days per year, with 10 hours of usage per day**, amounting to **2250 hours annually**. The power savings are derived by subtracting the LED load from the TL load for each floor. Using this power reduction, the **monetary savings in INR** are calculated based on an assumed electricity tariff. The **Ground Floor**, with 23 TLs replaced, achieves a saving of **0.552 kW**, resulting in a monetary saving of **₹8,706.42** per year. Similarly, the **First Floor**, with 26 TLs replaced, saves **0.624 kW**, contributing to an annual saving of **₹9,842.04**, while the **Second Floor**, with just one TL replaced, saves **0.024 kW**, equating to **₹378.54** in monetary savings. No data is provided for the Third and Fourth Floors. In total, replacing **50 TLs with LEDs results in a power saving of 1.2 kW** and an annual financial saving of **₹18,927.00**. This analysis demonstrates the cost-effectiveness and energy efficiency of switching to LED lighting, leading to significant long-term financial and environmental benefits.

Table 11: Energy Consumption and Saving estimated by replacement of Fans with LED Fans

Building	Floor	Quantity	Load KW	Saving	Operating Hrs.	Monitoring Saving
		Fan (60 W)	Fans (60 W)	LED Fan (25 W)	225 Days X 10 Hrs.	
		Number	KW	KW	Hours/Year	INR
Main Building	Ground Floor	32	1.92	1.12	2250	17665.2
	First Floor	36	2.16	1.26		19873.35
	Second Floor	37	2.22	1.29		20425.39
	Third Floor	30	1.80	1.05		16561.13
	Fourth Floor	52	3.12	1.82		28705.95
Total			11.22	6.54		103231.01

The table provides an estimation of **energy consumption and savings** achieved by replacing **60W traditional fans** with **25W LED fans** in the **Main Building** across different floors. It outlines the **number of fans** installed per floor, their **power consumption (load in kW)**, and the **power savings (kW) per floor** due to the replacement. The calculation is based on an annual operation of **225 days, with 10 hours of daily usage**, resulting in **2250 operational hours per year**. The savings are computed by subtracting the power load of LED fans from traditional fans, and the **monetary**

savings (INR) are estimated based on the reduced power consumption. The **Ground Floor**, with **32 fans replaced**, saves **1.12 kW**, leading to an annual financial saving of **₹17,665.20**. The **First Floor**, replacing **36 fans**, achieves **1.26 kW** of savings, translating into **₹19,873.35** saved per year. The **Second Floor**, with **37 fans replaced**, records **1.29 kW** in energy savings, amounting to **₹20,425.39**. Similarly, the **Third Floor**, with **30 fans replaced**, results in **1.05 kW** savings, leading to **₹16,561.13** saved annually. The **Fourth Floor**, with the highest replacement count of **52 fans**, achieves **6.54 kW savings**, resulting in the largest annual monetary saving of **₹28,705.95**. In total, the **replacement of 187 fans across all floors results in an energy saving of 6.54 kW and an annual financial saving of ₹1,03,231.01**. This analysis highlights the **significant cost savings and energy efficiency benefits** of adopting LED fans, making it a viable and sustainable solution for reducing electricity consumption.

The data highlights areas where energy efficiency improvements could be made, such as adopting BLDC fans, energy-efficient ACs, and optimized computer usage to reduce electricity costs and promote sustainability.

7. **Conclusion:**

The analysis of energy consumption and cost savings at **St. Xavier's College, Simdega**, through the replacement of **traditional tube lights and fans with energy-efficient LED alternatives**, demonstrates significant benefits in both energy efficiency and financial savings. The **replacement of TL (36W) with LED (12W) lights** across various buildings has resulted in an annual power saving of **approximately 1.2 kW**, leading to **substantial monetary savings**. Similarly, the **replacement of 60W fans with 25W LED fans** in the Main Building has contributed to an additional **6.54 kW of power savings**, translating into a notable reduction in electricity costs.

In total, the implementation of LED lighting and energy-efficient fans has resulted in an **annual financial saving of over ₹1,22,158** for the institution. This shift not only reduces operational costs but also aligns with sustainable energy practices, promoting an **eco-friendly and cost-effective campus environment**. The initiative undertaken at **St. Xavier's College, Simdega**, serves as a model for other institutions looking to optimize energy consumption and lower electricity expenses while contributing to environmental conservation.

Here is a **tabular summary** of the energy savings and monetary benefits from replacing traditional tube lights and fans with energy-efficient LED alternatives at **St. Xavier's College, Simdega**:

Table 12: Energy Savings and Monetary Benefits

Category	Quality Replaced	Power saving (KW)	Operating Hours (2250 hrs/yr)	Annual Monetary Saving (INR)
Tube lights (36W to LED 12W)	50	1.20	2250	18927.00
Fans (60W to LED 25W)	187	11.22		103231.01
Total Savings	237	12.42	2250	122158.01

7.1 Key Insights:

- **Total 237 units** (tube lights + fans) were replaced across the institution.
- The total **power saving is 12.42 kW**, significantly reducing electricity consumption.
- The institution is saving **₹1,22,158.01 annually**, making the initiative financially beneficial.
- The project promotes sustainability by reducing energy wastage and cutting down carbon emissions.

This structured implementation of energy-efficient appliances at **St. Xavier's College, Simdega**, sets a strong example for cost savings and environmental conservation through sustainable energy use.

Here are some **suggestions to improve** the energy condition in St. Xavier's college Simdega Jharkhand:

8. Data Presentation

- **Break Down Savings by Building:** A table showing savings for College buildings would help readers understand where the most impact is available in Table no. 10 & 11.
- **Graphical Representation:**

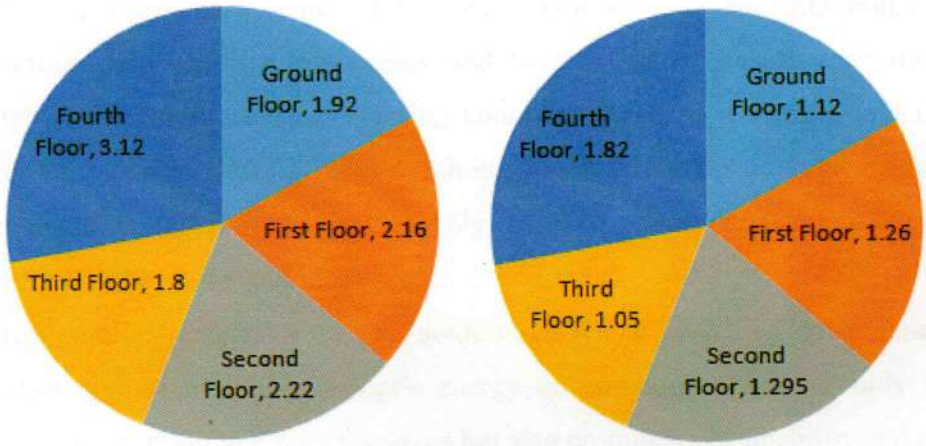


Figure 14: Energy upkeep Difference Existing Fan to LED Fan

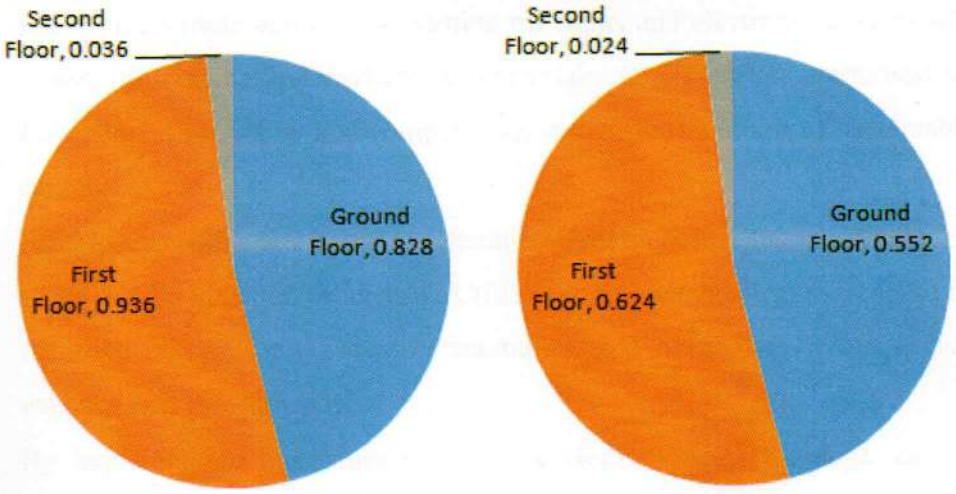


Figure 15: Energy uptake Difference Existing Tube light to LED Bulbs

9. Recommendations & Future Scope

Implementing energy-saving measures at St. Xavier's College, Simdega, can significantly reduce operational costs and promote environmental sustainability. Here are several strategies tailored for educational institutions:

- Begin by assessing current energy consumption to identify inefficiencies and areas for improvement. An energy audit provides a comprehensive understanding of energy usage patterns, enabling targeted interventions. Regular audits help in tracking progress and making informed decisions.
- Transition to energy-efficient lighting solutions, such as LED bulbs, which consume significantly less energy and have a longer lifespan than traditional lighting. Incorporate smart lighting controls, like motion sensors and daylight sensors, to automatically adjust lighting based on occupancy and natural light availability. This approach not only reduces energy consumption but also enhances the learning environment.
- Incorporating renewable energy solutions, such as installing solar panels, can offset a portion of the college's energy consumption. This not only reduces reliance on traditional power sources but also promotes sustainability and can lead to long-term cost savings.
- Educate students, faculty, and staff about the importance of energy conservation. Encourage simple actions like turning off lights and electronic devices when not in use, utilizing natural daylight, and maintaining appropriate thermostat settings. Engagement programs and competitions can foster a culture of sustainability on campus.
- Establish a routine maintenance schedule for all electrical and mechanical systems to ensure they operate efficiently. Utilize energy management systems to monitor real-time energy usage, identify anomalies, and make data-driven decisions to enhance energy efficiency.
- By implementing these measures, St. Xavier's College, Simdega, can achieve significant energy savings, reduce operational costs, and contribute to environmental sustainability.

10. Breakdown of Waste Types at St. Xavier's College, Simdega

The total commercial waste collected at St. Xavier's College, Simdega, Jharkhand, amounts to 10 kg, consisting of various types of waste materials. The majority of the waste, 55.7%, is biodegradable, including food scraps, paper, and organic matter, which can be composted or naturally decomposed. Soil and waste make up 24.14% of the total, likely due to dust, sand, and other inert materials accumulated from daily activities. Demolition waste, comprising 15.6%, includes broken bricks, concrete, and other construction debris.

Plastic waste, though a smaller portion at 1.15%, requires proper recycling and disposal to minimize environmental impact. Electrical and electronic waste (E-waste), which accounts for 0.25%, consists of discarded electrical appliances or components like batteries, wires, and old gadgets. Bio-medical waste, though minimal at 0.01%, needs careful handling as it may include medical or laboratory-related disposables. Additionally, 3.15% of the waste falls under the "Other" category, which may include mixed residual waste or materials that do not fit into the primary classifications.

Effective waste management strategies such as segregation, composting of biodegradable waste, recycling of plastic and e-waste, and responsible disposal of demolition and biomedical waste can help St. Xavier's College maintain a clean and sustainable environment.

Table 13: Breakdown of Waste Types at St. Xavier's College, Simdega

Physical Composition of commercial waste		**Total waste collected**	**10 Kg**
Sl. No.	**Type of waste**	**Unit**	**Result**
1	Biodegradable waste	%	55.7
2	Plastic waste	%	1.15
3	Soil & waste	%	24.14
4	Demolition	%	15.6
5	Electrical & Electrical waste	%	0.25
6	Bio-medical Waste	%	0.01
7	Other	%	3.15

ENVIRONMENTAL LABORATORIES & ENGINEERING SERVICES PVT. LTD.

PLOT NO-30, MANSAROVAR ENCLAVE, TUPUDANA
HATIA, RANCHI-834003 (JHARKHAND)
GST NO:- 20AAECE9713D1Z4

Email: info@elespl.co.in , eles.ranchi@gmail.com
Phone no.: 0651-2290103
Website : www.elespl.co.in

CIN: U74999JH2018PTC011125

TEST REPORT

Test Report No.	**: ELES/RNC/2025/1082**	**Report Release Date**	**: 20.02.2025**

CUSTOMER DETAILS		**SAMPLE DETAILS**	
Customer Name	: St. Xavier's College, Simdega	Sample Ref. No.	: ELES/RNC/2025/WD/0887
		Sampling Date	: 04.02.2025
Address	: P.O.- Gotra, P.S.- Simdega, Dist- Simdega, Jharkhand-835235	Sample Received Date	: 05.02.2025
		Type of Sample	: Commercial Waste
		Source of Sample	: College (Waste Storage Area)
		Sampling Done By	: ELES Pvt. Ltd.
		Sample Condition	: Sealed
College Status	: Operational	Period of Analysis	: 05.02.2025 to 15.02.2025

Physical Composition of commercial waste		**Total waste collected**	**10 Kg**
Sl. No.	**Type of waste**	**Unit**	**Result**
1	Biodegradable waste	%	55.7
2	Plastic waste	%	1.15
3	Soil & waste	%	24.14
4	Demolition	%	15.6
5	Electrical & Electrical waste	%	0.25
6	Bio-medical Waste	%	0.01
7	Other	%	3.15

Note:
1. 10kg of fresh commercial waste was collected and weighted by Means of Spring Balance.
2. Sample was segregated manually in seven Categories via Biodegradable Waste, Plastic Waste, Soil & Dust, Demolition Waste, Electrical & Electronics Waste, Bio-Medical Waste and others.
3. The Segregated Materials were weighted by means of Electronics Balance again.
4. Physical composition is calculated on the basis of Total Samples weighted verses the Segregated Fractions.
5. Graphical Representation of Data (Pie-Chart) along with Photographs are attached as Annexure-1

Environmental Laboratories & Engineering Services Pvt. Ltd.

Reviewed by

****End of Report****

Authorised Signatory
Akash Kumar
Quality Manager

ENVIRONMENTAL LABORATORIES & ENGINEERING SERVICES PVT. LTD.
CIN: U74999JH2018PTC011125
PLOT NO-30, MANSAROVAR ENCLAVE, TUPUDANA
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Website : www.elespl.co.in

St. Xavier College Graphical Presentation of Waste Disposal

Annexure - 1

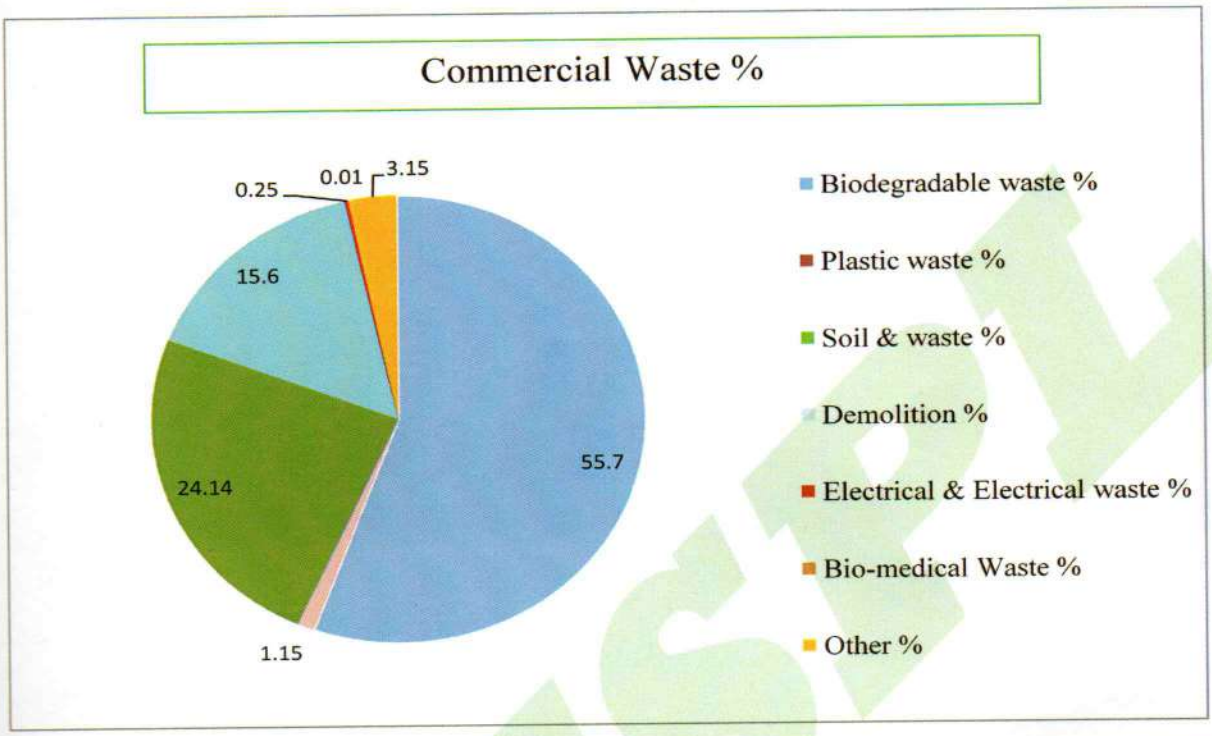

Figure: - Waste Collection at Waste Disposal Area of St. Xavier College, Simdega

SERVICE INVOICE

(DUPLICATE FOR TRANSPORTER)

Environmental Lab. & Eng. Services Pvt. Ltd (from 1-Apr-24)
Block -A, Flat No- I-109, Tapovan Residential Estat
Hawai Nagar, Road No-2, Birsachowk Ranchi-834003
Office Add-Plot No-30, Mansarovar Enclave, Hatia, Tupudana-Ranchi
UDYAM : UDYAM-JH-20-0006735 (Micro/Services)
GSTIN/UIN: 20AAECE9713D1Z4
State Name : Jharkhand, Code : 20
CIN: U74999JH2018PTC011125
E-Mail : eles.ranchi@gmail.com

Invoice No.	Dated
ELESPL/24-25/508	**18-Mar-25**
	Mode/Terms of Payment
Reference No. & Date.	Other References
Buyer's Order No.	Dated
Terms of Delivery	

Buyer (Bill to)

M/S St. Xavier's College (Simdega)
PO-Gotra, PS-Simdega
Dist-Simdega, Jharkhand
State Name : Jharkhand, Code : 20

Sl No.	Description of Goods and Services	HSN/SAC	Quantity	Rate	per	Disc. %	Amount
1	**Ambient Air Quality Monitoring**	999490	**3 Point**	9,020.00	Point		**27,060.00**
2	**NOISE MONITORING**	999490	**3 Point**	1,540.00	Point		**4,620.00**
3	**Driking Water Analysis**	999490	**1 nos**	10,780.00	nos		**10,780.00**
4	**Waste Water Analysis**	999490	**1 nos**	9,020.00	nos		**9,020.00**
5	**Light Intensity Measurement**	999490	**4 nos**	1,320.00	nos		**5,280.00**
6	**Bio-Diversity**	999490	**1 nos**	15,400.00	nos		**15,400.00**
7	**Energy Audit**	999490	**1 nos**	15,400.00	nos		**15,400.00**
8	**Waste Disposal and Waste Analysis**	999490	**1 nos**	8,800.00	nos		**8,800.00**
							96,360.00
	OUTPUT CGST@9%			*9*	%		**8,672.40**
	OUTPUT SGST@9%			*9*	%		**8,672.40**
	ROUND OFF						**0.20**
	Total						**₹ 1,13,705.00**

19/03/25
Principal
St. Xavier's College
Simdega

Amount Chargeable (in words) *E. & O.E*

INR One Lakh Thirteen Thousand Seven Hundred Five Only

HSN/SAC	Taxable Value	CGST		SGST/UTGST		Total Tax Amount
		Rate	Amount	Rate	Amount	
999490	96,360.00	9%	8,672.40	9%	8,672.40	17,344.80
Total	**96,360.00**		**8,672.40**		**8,672.40**	**17,344.80**

Tax Amount (in words) : **INR Seventeen Thousand Three Hundred Forty Four and Eighty paise Only**

Company's PAN : **AAECE9713D**

Declaration
1. WE DECLARE THAT THIS INVOICE SHOWS THE ACTUAL PRICE OF THE SERVICE DESCRIBED AND THAT ALL PARTICULARS ARE TRUE AND CORRECT.
2. ADVANCE PAYMENT 100% ALONG WITH WORK ORDER IS REQUIRED

Company's Bank Details
A/c Holder's Name : **ENVIRONMENTAL LAB And ENG SERVICES PVT LTD**
Bank Name : **HDFC BANK**
A/c No. : **50200032166360**
Branch & IFS Code : **Singh More, Hatia, Ranchi & HDFC0005770**

for Environmental Lab. & Eng. Services Pvt. Ltd (from 1-Apr-24)
Niranjan Kumar Singh
Authorised Signatory

This is a Computer Generated Invoice