LADY IRWIN COLLEGE

ENERGY AUDIT REPORT

2021-2022

PREPARED BY

EHS ALLIANCE SERVICES

CONTENTS

CERTIFICATE

EHS alliance

AUDIT CERTIFICATE

PRESENTED TO

LADY IRWIN COLLEGE

Sikandra Road, Mandi House, New Delhi, 110001

Has been assessed by EHS Alliance Services for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

ENERGY AUDIT

The energy-saving initiatives carried out by the College have been verified in the report submitted and were found to be satisfactory.

The efforts taken by management and faculty towards all types of energy used in the College and sustainability are highly appreciated and noteworthy.

EHS ALLIANCE SERVICES GURGAON

AUDITOR SIGNATURE

25.11.2022
DATE OF AUDIT

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ACKNOWLEDGEMENTS

EHS Alliance Services would like to thank the management of Lady Irwin College, for assigning this important work of Energy Audit. We appreciate the co-operation to the teams for completion of assessment.

We would like to specially thank ***Prof. Anupa Siddhu – Director, Lady Irwin College*** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank ***Audit Conveners - Prof. Puja Gupta (Convener, NAAC Cr. VII), Prof. Meenakshi Mital (Convener, NAAC Cr. VII), and Dr. Meenal Jain (Member, NAAC Cr. VII),*** for steering the audit process, without which the completion of the project would not have been possible. We are also thankful to other staff members for their constant support in completing the compilation of data in a timely manner.

We are also thankful to

Prof. Sushma Goel	*Vice Principal*
Prof. Rupa Upadhyay	*Convener, Garden Committee*
Ms. Vishakha Sambhav	*Member, NAAC Cr. VII*
Ms. Shefali Chopra	*Member, NAAC Cr. VII*
Ms. Mitali Yadav	*Member, NAAC Cr. VII*
Mr. Rajneesh Dwevedi	*Member, Eco-club*
Ms. Seema Das	*S/O, Accounts Department*
Mr. Amit	*Administrative Department*

DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Lady Irwin College based on input data submitted by the representatives of college 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 following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by 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.

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EHS ALLIANCE SERVICES GURGAON

Vijay Singh
Lead Auditor EMS & Energy

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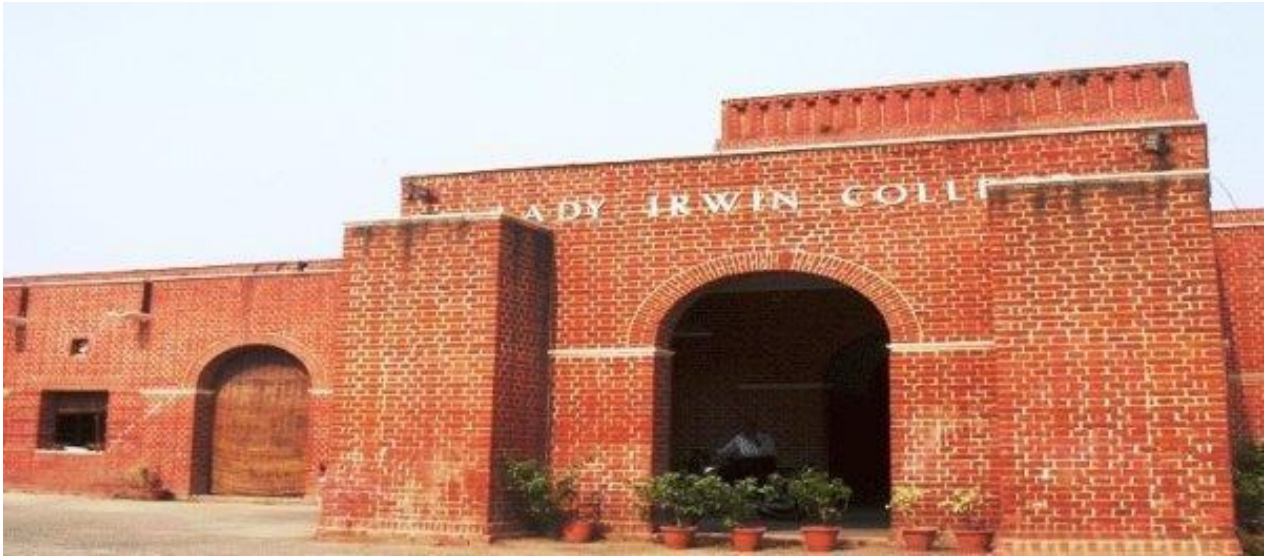
ABBREVIATION

A	**Amps**
AC	**Air Conditioner**
AC	**Alternating Current**
AMET	**Academy of Maritime Education and Training**
CFL	**Compact fluorescent lamp**
CIP	**Comprehensive Inspection Programme**
DC	**Direct Current**
HSD	**High Speed Diesel**
Hz	**Hertz**
kg	**Kilogram**
kVA	**kilo-volt-ampere**
kW	**kilo Watts**
kWh	**kilowatt hour**
kWp	**Kilowatt peak**
LED	**Light Emitting Diode**
LPG	**Liquefied Petroleum Gas**
MMS	**Module mounting structure**
MPPT	**Maximum Power Point Tracker**
NAAC	**The National Assessment and Accreditation Council**
SEC	**Specific Energy Consumption**
SPV	**Solar Photovoltaic**
STC	**Standard Test Condition**
TV	**Television**
V	**Volts**
W	**Watts**
W/m2	**watt per square meter**

INTRODUCTION OF COLLEGE

Lady Irwin College is a constituent college for women, in the University of Delhi, underthe memorandum of Association of The Lady Irwin College Society vide Regd. Society Registration Act 1860 (Punjab Amdmt.) 1957 Registration No.4163 (1969-70) & maintained by the Governing Body & UGC Grants. Lady Irwin College is a premiere institution affiliated to University of Delhi for Undergraduate and Postgraduate education in Home Science. It also supports doctoral programs in five areas of Home Science. Other programmes are two year B.Ed. (for students of Home Science), B.Ed. Special Education MR (for students from all streams) and one year Postgraduate Diploma in Dietetics & Public Health Nutrition.



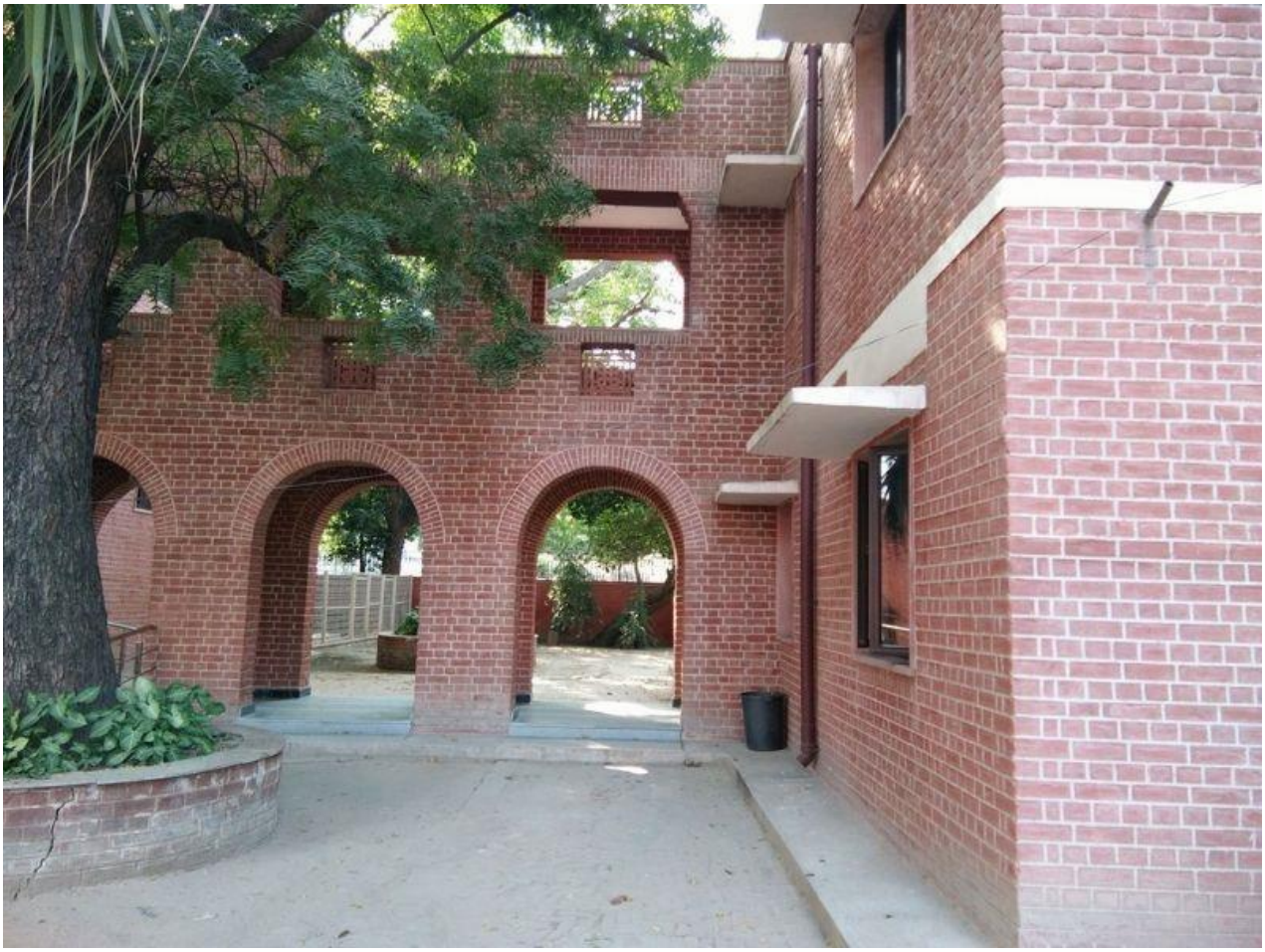
It aims for holistic development of women students, and their capacity building through carefully designed academic programmes and extramural activities.

The Lady Irwin College aphorism is VIDYA HI SEWA. The teaching learning transactions true to the motto Endeavour to inculcate a sense of knowledge to serve through carefully designed outreach experiences.

The College has always provided headship to other institutions in the nation in teaching, research and extension in Home Science, both at central universities and Home Science colleges with agricultural institutions.

Lady Irwin College has celebrated 83 years in 2015.The education in this college aims towards capacity building for entrepreneurship, improved quality of life and overall development of the students. It is a nodal and template institution for Home Science education in the country.

The academic disciplines in the college are artistic, creative, culturally rooted and contemporary. The programmes are scientifically planned which include education in textile technology, food processing, metabolism, environment, sustainable technologies, food safety, health and disease and human development. The focus of college is to have holistic education for the all round development of the students.



High standard of education is maintained in pedagogical strategies and course structuring by the faculty members. The curriculum is internationally competitive. The college hopes to improve the talent and nurture creativity among its students for playing positive role in the society.

VISION

Strives to inculcate the spirit of service along with professional development and skills for women empowerment through state of the art education, research and extension by nurturing innovation, leadership and national development.

Lady Irwin College has been a pioneer in women's education. Set up more than eight decades ago, the vision for empowering women continues to be the key thrust of the College. It is indeed a matter of pride for us that the Father of the Nation Mahatma Gandhi gave us our motto Vidhya Hi Sewa (service through knowledge). True to the motto, our educational endeavour has been to inculcate the spirit of service along with professional growth of students. The college remains committed to building leadership,conscious citizenry and active participation of women for furthering national developmental goals. The college encourages the development of scientific temper withspecial focus on individual, family and community life. The education in the college aims towards developing creative and critical thinking, nurturing innovation and excellence. Lady Irwin sees its students building capacity to acquire global skills for entrepreneurship, professional proficiency and improved quality of life.

Eminent national and international leaders helped envision Lady Irwin College goals and the role it could play in the field of higher education for women. They built strong foundations based on core values of social justice, veracity, service and sustainability for achieving excellence in all spheres of life. These have continued to guide and contour the curricular and co-curricular thrusts of the college through the decades.

Since its inception, Lady Irwin College, has been a flag-bearing institute for Home Science education in the country, both at the school and college level and has always provided leadership to other institutions across the country. The knowledge, innovations, tenets and thrusts provided by the college over the years have percolatedto put Home Science as a discipline on the academic map of India.

MISSION

The college faculty has consistently strived to contemporize its academic content through innovative research, strong community outreach and implementation of new technological knowledge in the field of Home Science. Every department of the college, along with developing core discipline specific skills among the students, also addresseslarger societal issues like health, gender, conservation of textile heritage, socio- economic inequalities, community mobilization, people's participation, resource utilization, environment and education.

The curriculum helps young women students develop key life skills for their future professional and societal roles. Their experiences at college are designed to facilitate self-development and nurture them so that they become aware, active and enthusiasticmembers of the community and the nation at large. In a nutshell, through curricular and co-curricular

activities at both UG and PG levels, we strive to:

- Accomplish training and development of young women for professional employment
- Generate an appreciation and respect for our cultural heritage and traditionswith a critical orientation towards social and economic advancement
- Undertake training of trainers and educators
- Develop research and critical analysis skills for analyzing and suggestingnational development strategies
- Strengthen linkages with other teaching and research institutions andprofessionals at all levels
- Give impetus to community outreach and extension

The courses at Lady Irwin strive to build a cadre of professionals:

- Focusing specifically on issues, programmes and policies of health and well-being of children, women and families
- Nutrition, dietetics, food processing, food safety and security
- Heritage textiles, textile technology and apparel design
- Early childhood care and education, parenting, family counselling
- Education of children in formal and non-formal settings, including persons with disabilities
- Sustainable management of resources and new product development
- Communication for development, participatory communications and innovative media development

Lady Irwin College offers following programs

Postgraduate Programmes

- B.Ed. – Two Year degree course
- B.Ed. Special Education (MR) – Two Year degree course
- Postgraduate Diploma in Dietetics and Public Health Nutrition –PGDDPHN (1 Year)
- M.Sc. – Four semester degree course in the following specializations
    - Food and Nutrition
    - Human Development and Childhood Studies
    - Fabric and Apparel Science
    - Development Communication and Extension
    - Resource Management and Design Application

Undergraduate Programmes

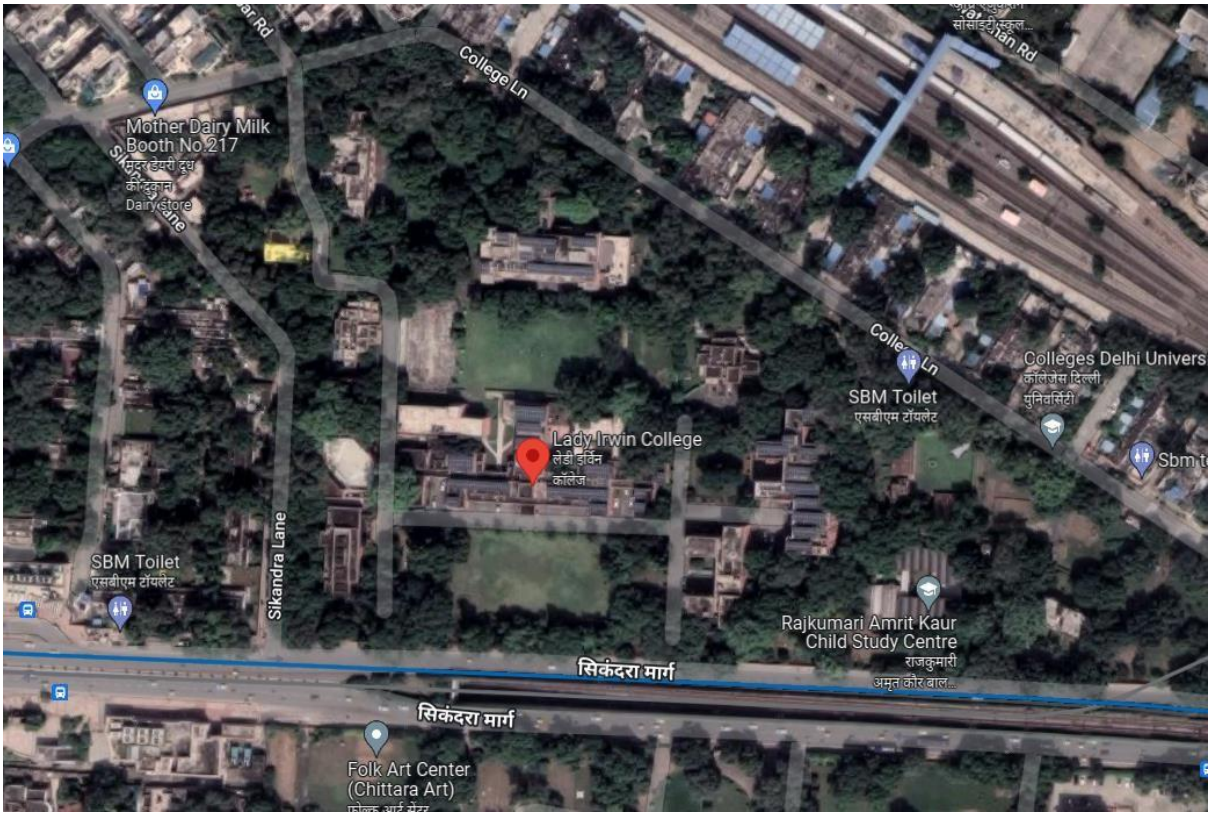
- B.Sc. Home Science (3 Years)
- B.Sc. (Hons) Home Science (3 Years)
- B.Sc. (Hons) Food Technology (3 Years)
- NEP Cluster SEC,VAC and AEC Sem I(Nov.2022-Feb. 2023)

Ph. D. All 5 specializations

Short-term Certificate Courses

- Rhinoceros Course
- Retail Management Course
- CSR course
- Auto CAD Course

Map location of campus



AUDIT PARTICIPANTS

On behalf of LADY IRWIN COLLEGE

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Prof. Meenakshi Mital	*Convener, Environment Audit & NAAC CR-VII*
Dr. Meenal Jain	*Convener, Environment Audit & Member, NAAC CR-VII*
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Ms. Mitali Yadav	*Member, NAAC CR-VII*
Ms. Geetika Mishra	*Ph.D. Scholar*

On behalf of EHS Alliance Services

Name	Position	Qualifications
Dr. Uday Pratap	*Co-Auditor*	*Ph.D. , PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Mr. Vijay Singh	*Lead-Auditor*	*M.Sc., M.Tech in Environment Sciences, Field Expert, Energy Auditor, Post Diploma in Industrial Safety Management*

EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Lady Irwin College. Reducing the energy consumption despite improving the human comfort, health and safety were of primary concern.

Beyond just identifying the energy consumption pattern, this audit sought to detect and categorize the most energy efficient appliances. Additionally, some daily practices relating common appliances have been shared which may help reducing the energy consumption. Data collection for energy audit of the College was carried out by the EHS Alliance Team. The Energy Audit Report accounts for the energy consumption patterns of the college on actual survey and detailed analysis during the audit.

The work comprehends the area wise consumption traced using suitable equipment. The analysis was carried out by our team with the support of the staff members from Lady Irwin College. The report provides a list of possible actions to preserve and efficiently access the available source, resources and their saving potential was also identified. We look forward towards optimization that the authorities, students and staff members would follow the recommendations in the best possible way. The report is based on certain generalizations including the approximations wherever necessary. The views conveyed may not reveal the general opinion. They merely represent the opinion of the team guided by the interviews of clients. We are happy to submit this Energy audit report to the Lady Irwin College.

ENERGY AUDIT ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and for analyzing the average monthly consumption we have collected electricity energy bills from April 2021 to March 2022

The details of **"Meter Connection"** at **"Lady Irwin College"** are as follows-

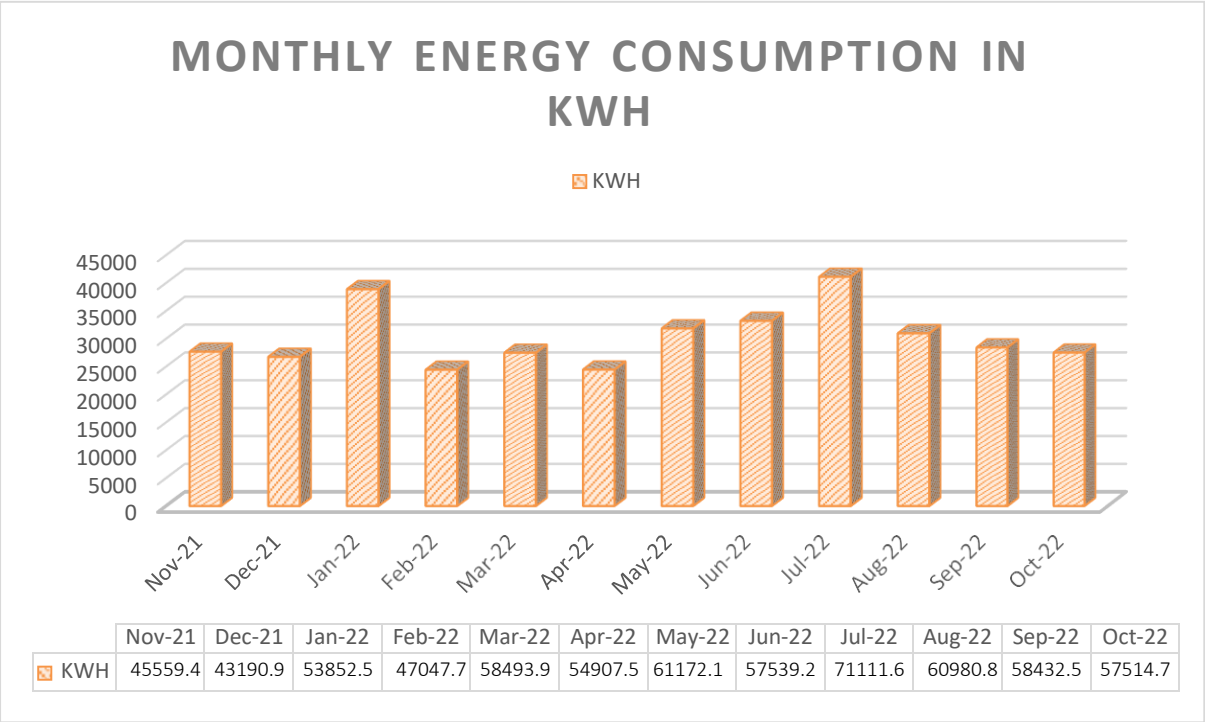
Name - The Director Lady Irwin College

CA No. - 3141109602

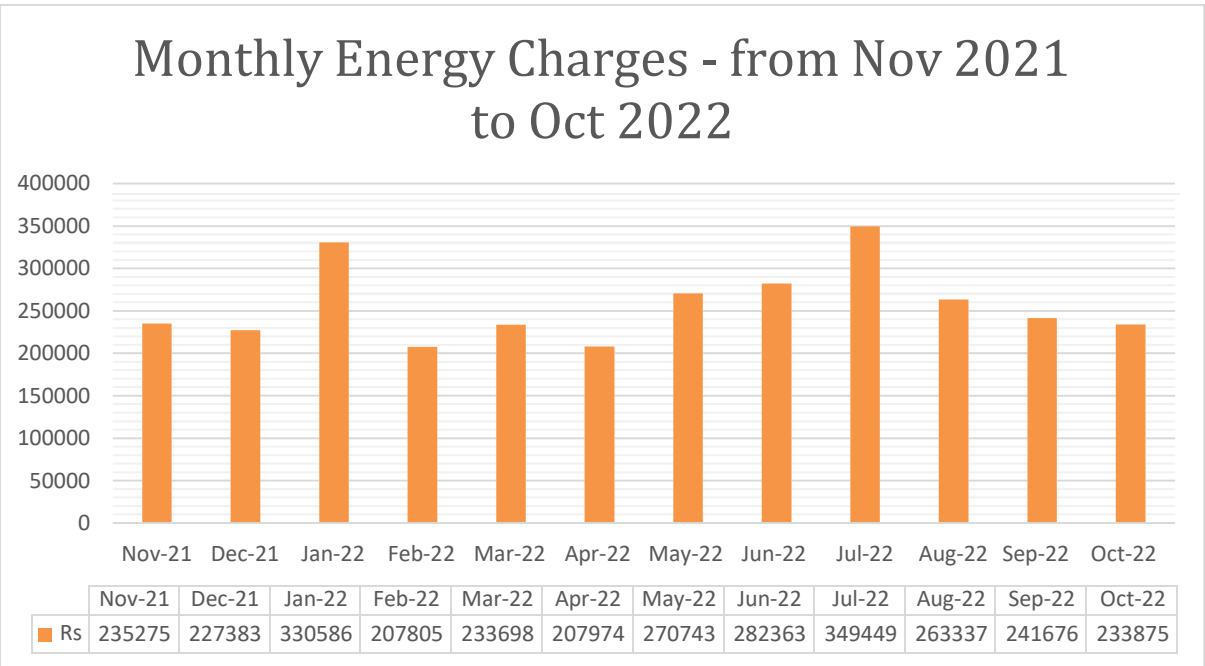
1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and for developing the baseline parameter we have collected monthly energy bill for the 12 months i.e. from Nov 2021 to Oct 2022

Month	Grid - Billing	Solar P V	Total	Rate INR	Amount in INR
Nov-21	27679	17880	45,559	8.50	235,275
Dec-21	26751	16440	43,191	8.50	227,383
Jan-22	38893	14960	53,853	8.50	330,586
Feb-22	24448	22600	47,048	8.50	207,805
Mar-22	27494	31000	58,494	8.50	233,698
Apr-22	24468	30440	54,908	8.50	207,974
May-22	31852	29320	61,172	8.50	270,743
Jun-22	33219	24320	57,539	8.50	282,363
Jul-22	41112	30000	71,112	8.50	349,449
Aug-22	30981	30000	60,981	8.50	263,337
Sep-22	28433	30000	58,433	8.50	241,676
Oct-22	27515	30000	57,515	8.50	233,875
Total	362,843	306,960	669,803		3084164



	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
KWH	45559.4	43190.9	53852.5	47047.7	58493.9	54907.5	61172.1	57539.2	71111.6	60980.8	58432.5	57514.7



	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22
Rs	235275	227383	330586	207805	233698	207974	270743	282363	349449	263337	241676	233875

2. DIESEL CONSUMPTION

Below is the diesel consumption details in litres from Nov 2021 to October 2022.

Period	Diesel consumption (in litres)
Jul	*20*
Aug	*20*
Sep	*20*
Oct	*20*
Nov	*20*
Dec	*20*
Jan	*20*
Feb	*20*
Mar	*20*
Apr	*20*
May	*20*
Jun	*20*
Total	***240***

3. ANALYSIS OF DG SETS

In the college, there are 3 Diesel Generator (DG) sets for its electrical power needs incase of Grid power failure.

DG Set Performance		
Description	**Unit**	**DG at Station**
Design details:		
Rated capacity	kVA	**120**
Hz		**50**
Sl No.		08.20/20-21/0272
Make		Sudhir
Volts	Volts	415
PF		0.8
Phase		3
RPM		1200
Amps	Amps	445.2
Mfg.		2011

Observation and Suggestions:- As per the trial taken during the energy audit the percentage loading of DG set is 61.56% which is ok and specific energy consumption of DG Sets 3.12 KWH/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/litre and above.

4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's coolingCapacity (in Btu/h) by its power input (in watts) at full-load conditions. The higher the EER, the More efficient the unit. The cooling effect produced is quantified as tons of refrigeration (TR). The TR is also called as air-conditioning tonnage.

There are both Split ACs and windows ACs installed in Lady Irwin College in various areas of various capacity which detail is given below:

Block Details	Location/Identification	AC 1.0 TR	Ac 1.5 TR	AC 2.0 TR
PG Block	FN Faculty		1	
Phase-II	Admin office			2
Phase-II	Vice-Principal		1	
Phase-II	Teaching staff room		2	
Phase-II	Accounts office-I			1
Phase-II	Account office -II		1	
Phase-II	P.A. room (Director)	1		
Phase-II	Director office			2
Phase-II	NAAC room		1	
CRC	CRC	1		
CRC	CRC (Office)	1		
CRC	CRC (Room)		1	
CRC	CRC first floor/ Corridor		1	
CRC	Server room		2	
CRC	Sports Room		1	
New B.Ed. Block	Teacher Room		1	
New B.Ed. Block	HOD Room		1	
New B.Ed. Block	MP - 1			1
New B.Ed. Block	Teaching staff room		1	
New B.Ed. Block	Staff room 2		1	
HDCS	Teaching Lunchroom	1		
HDCS	Staff room		1	
HDCS	Seminar Room		3	
HDCS	Faculty Room-2	1	1	
Other Campus Area	Other Campus Area		3	
Old B.Ed. Block	FAS Faculty		1	

RMDA	Faculty Room		3	
RMDA	Teachers Lunchroom		1	
RMDA	PG EMSD Lab		4	
RMDA	PG Research Lab		3	
RMDA	PG Design Lab		4	

Remarks: - We have checked Energy Efficiency Ratio of AC's and EER of AC's is fairly OK. But in future we recommend Lady Irwin College to purchase 5-Star rated invertor based split AC's because power consumption of Inverter based BEE 5-Star rated AC's is less than non-star rated AC's.

5. FAN ANALYSIS

In the Lady Irwin College, 356 Ceiling Fans of 70 W, are installed. The observation and suggestion are given below.

Location	Fan Count (70 W)
RMDA	55
PG Block	37
Phase II	99
CRC	61
New B. Ed Block	39
HDCS	25
Old B.Ed. Block	36
Other campus area	4

Observation and Suggestions:-

In the college, the majority of ceiling fans are of 70 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. Therefore we suggest Lady Irwin College to replace with BEE 5 Star rated fans of 30W.

ECRM-1-Energy saving by replacing 70 W fans with energy efficient 30W ceiling fans

Total no of Ceiling Fans (70 W)	=	**356**	Nos.
Total wattage of existing Fans (730W)	=	24920	Watt
Total wattage of BEE 5 Star rated Fans (30W)	=	10680	Watt
Total saving in Wattage after replacement	=	14240	Watt
Operating hours per day	=	8	Hours
Operating days per annum	=	180	Days

Energy charges per unit in Rs.(average price)	=	8.5	INR
Saving in Rs./annum	=	174298	INR
Investment INR	=	854400	INR
Payback period:-	=	4.9	YEARS

Note:- Energy saving will increase or decrease if operating hours of machine /equipment will be increase or decrease and payback period will also increase or decrease if cost of investment(Cost of machine/equipment/accessories of machine) will increase or decrease because cost of investment is taken on tentative basis.

6. ANALYSIS OF LIGHTING SYSTEM

6.1 Brief description of existing system

For assessing energy efficiency of lighting system, Inventory of the Lighting System has been noted / collected, with the aid of a lux meter, measurement and documentation of the lux levels at various locations at working level has been done.

6.2 Inventory of Lighting

Sl. No.	Location/Identification	8W LED	14W LED	TS 28W	TS 40W	10W LED	18W LED Light	20W CFL	CFL/BULB	Halogen 100W
RMDA	U G Design Lab								24	
RMDA	Pantry room							4		
RMDA	Sustainability Lab								8	
RMDA	Student Toilet					6				
RMDA	Disabled Toilet					1				
RMDA	Librarian Office				4					
RMDA	Compilation Office				1	1				
RMDA	Thesis				4					
RMDA	Lunch room				4					
RMDA	Library office				3	1				
RMDA	Library washroom				2					
RMDA	Server Area					2				
RMDA	Student washroom				1					
RMDA	Reading Area				16	10				
RMDA	Property counter				2					
RMDA	Checking area				1	1				

RMDA	Circulation area				3	1				
RMDA	Store room				1	1				
PG Block	Newspaper Section				3					
PG Block	Reading Hall Washroom				1	1				
PG Block	Upstaires				1					
PG Block	CRC Server area				10					
PG Block	Photocopy area				3	2				
PG Block	Compentors area				10	6				
PG Block	FN CR - I			13						
PG Block	FN CR - II			6						
PG Block	FN Faculty			8						
PG Block	Guest Washroom			1						
PG Block	Student Washroom			2						
PG Block	Faculty Washrrom			2						
PG Block	Lift Corridore/ Dept Corridore			13						
PG Block	FN Faculty Room			2						
PG Block	NCEARD			8						
PG Block	FN Teacher Lunchroom			8						
PG Block	FN T.A Room			4						
PG Block	FN Faculty room (V)			6						
PG Block	Saroja Lab			24						
PG Block	Institutional / Food			24						
PG Block	Public Health (Nut. Lab)			18						
Phase-II	FN Faculty room			10						
Phase-II	FN Department Library			12						
Phase-II	FNCR (IV)			14						
Phase-II	FN QC Lab			24						
Phase-II	Micro Lab			25						
Phase-II	Gallery/ Corridore			32						
Phase-II	FSQC Lab			24						
Phase-II	FN CR-III + Store	8		8						
Phase-II	Toilets			13		4				
Phase-II	Staires			3						
Phase-II	Lab Staff + Staff Room			6						
Phase-II	Extention Labs			48						
Phase-II	Communication Labs			36						
Phase-II	Pnatry					4				
Phase-II	DCE Broacast Media			18						
Phase-II	oral Visual Communication Lab			24						
Phase-II	Class Romms			12						
Phase-II	Faculty Rooms			14						
Phase-II	Discussion Room			8						
Phase-II	Others			28						
Phase-II	Store room			2						
Phase-II	CR-II Room				4			1		
Phase-II	Teacher Wsahroom							1		
Phase-II	Student washroom							2		
Phase-II	FN (TR)				4					
Phase-II	First Floor Washroom							2		
Phase-II	Seminar Room				11					
Phase-II	FN 31 Room				13					
Phase-II	FN Faculty room (IX)				3					

Phase-II	Teacher Wsahroom -II							4		
Phase-II	Admin office							2		
Phase-II	Admin Store				1			2		
Phase-II	Vice-Principal			1	1			4		
Phase-II	Teaching staff room			1	4			6		
Phase-II	Accounts office-I			2				5		
Phase-II	Account store				2					
Phase-II	Account office -II			2				2		
Phase-II	P.A. room (Director)			4				1		
Phase-II	Director office			2				2	14	
Phase-II	NAAC roon				2			2		
CRC	CRC				1			3		
CRC	CRC (Office)				1			3		
CRC	CRC (Room)				12			4		
CRC	CRC Store			1	2					
CRC	Corridore CRC				1			2		
CRC	CRC Kitcken	1								
CRC	CRC first floor/ Corridore				9					
CRC	Server room			6						
CRC	Medical help desk							2		
CRC	CR-I room				12			2		
CRC	Chemistry Lab Deparment							2		
CRC	Chemistry room							10		
CRC	Chemistry store				3			3		
CRC	Admin back Corridore							16		
CRC	Textiles design				16			7		
CRC	TSS Staff Room				3	1				
CRC	TD Desk Store room				1					
CRC	Gets Toilet			1				2		
CRC	Food and Tutrition Faculty							3		
CRC	DR - II			2	5			8		
CRC	F&N Lab (Staff)			1		1		2		
CRC	F & N Lab			13		4		1		
CRC	SKCs Lab			16				1		
CRC	SKCS Staff Room			4		5		1		
CRC	Front Corridore (Admin)			3	1			3		
CRC	Ram Lal Hall					5		15		
CRC	Stage Hall				2			1		
CRC	Greem Room				4					2
CRC	Sports Room				1			4		
CRC	B.Ed. Class room				4					
CRC	Ladies Washroom				1			2		
CRC	Maoin Porch	4								
CRC	Food Product Lab			13				6		
New B.Ed. Block	Toilet			7						
New B.Ed. Block	Old Canteen				4					
New B.Ed. Block	Reserve Room				3					
New B.Ed. Block	B.Ed. Class Room				4					
New B.Ed. Block	Pedagogy				2					
New B.Ed. Block	Teacher Room			4						
New B.Ed. Block	HOD Room			3						
New B.Ed. Block	Corrodor	5		3						
New B.Ed. Block	MP - 1			27						

New B.Ed. Block	Teaching staff room			8						
New B.Ed. Block	Gallery	3		1						
New B.Ed. Block	Under Amphy area			85						
New B.Ed. Block	Basement-B1			24						
New B.Ed. Block	Basement Class room		76							
New B.Ed. Block	G F/R Toiet			9						
New B.Ed. Block	B.Ed. CR			10						
New B.Ed. Block	Staff room 2			3						
New B.Ed. Block	Library			9						
HDCS	Teaching Lunchroom				2					
HDCS	L Room-I				5			1		
HDCS	L Room-II				6			1		
HDCS	Staff room				2			4		
HDCS	Seminar Room				8					
HDCS	PG (HD) Lab				5			1		
HDCS	Faculty Room-1				6					
HDCS	Faculty Room-2				9					
HDCS	Toilet				2					
HDCS	Porta			6	10			8		
Other Campus Area	Other Campus Area			1	60	6				
Old B.Ed. Block	Corridor				5					
Old B.Ed. Block	DP Lab				14			4		
Old B.Ed. Block	Teachers Room				19			8		
Old B.Ed. Block	Lab Staff Room				2			2		
Old B.Ed. Block	DRI				10			1		
Old B.Ed. Block	Store room				2					
Old B.Ed. Block	M.Sc. FAS Class room				24			4		
Old B.Ed. Block	Porta FAS			1	3			5		
Old B.Ed. Block	Bottany Lab & Faculty			3	8			8		
Old B.Ed. Block	FAS Faculty				1			1		
Old B.Ed. Block	AC & Staff Room			18				3		
Old B.Ed. Block	FD Lab and Faculty							13		
Old B.Ed. Block	Zoology Lab			2	14					
Old B.Ed. Block	Fashion Studio			10	5			1		
Old B.Ed. Block	NBC Lab & Staff Room			16				4		
RMDA	Washroom			5						
RMDA	Faculty Room			21						
RMDA	Reaserch Room			7				7		
RMDA	Library			7						
RMDA	Teachers Lunchroom							4		
RMDA	Corridore			13						
RMDA	Lab Staff room							2		
RMDA	PG EMSD Lab			24						
RMDA	PG Research Lab			18						
RMDA	PG Design Lab			24						
Phase-II	Faculty Room			10						
Phase-II	Toilets		1			3				
Phase-II	UG CRI			4						
Phase-II	Enterpreneur Lab			10						
Phase-II	RMDA Lab			50						
Phase-II	Gallery			8						
TOTAL		21	77	1023	429	66	0	225	46	2

6.3 Lux Measurement

Description	Lux	Remark
Class Rooms	120 to 235	Acceptable
Offices	130 to 240	Acceptable
Corridors	35 to 90	Acceptable
Washrooms	45 to 76	Acceptable
Outdoor	36 to 95	Acceptable
Computer Lab	150 to 289	Acceptable
Parking area	45 to 94	Acceptable
Canteen	69 to 185	Acceptable

Observation

Lady Irwin College has initiated implementation of LED based lighting solution in the campus. LEDs save energy, the life span is much greater and emit virtually no heat. The college has installed solar lights for street lights in the campus.

We recommend college to replace 40W TS lights and 20 W CFL lights with LED bulbs for energy conservation

Table below shows the performance characteristics comparison of all luminaries.

Table - Luminous Performance Characteristics of Commonly Used Luminaries					
Type of Lamp	**Lumens/Watt**		**Colour Rendering Index**	**Typical Application**	**Typical Life**
	Range	**Avg.**			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent Lamps (CFL)	40-70	60	Very Good (85)	Hotels, shops, homes, offices	8000-10000

High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking. flood lighting	5000
Halogen lamps	18-24	22	Excellent (100)	Display, flood lightening, stadium exhibition grounds, construction areas	2000 - 4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in ware houses, factories, street lighting	6000 - 12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000 - 12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spot lighting, flood lighting, retail stores	8000
LED Lamps	30-50	40	Good (70)	Reading lights, desk lamps, night lights, spotlights, security lights, signage lights, etc.	40000 - 100000

Observation

There should be regular maintenance schedule of equipment like geyser, water coolers, pumps, etc. in order to increase the efficiency of the appliances.

RECOMMENDATIONS AND SUGGESTIONS

Initiatives towards awareness generation regarding environment consciousness should be expanded to larger section of the community.

Environment friendly criteria should be more elaborative in the environment policy.

CONCLUSION

Lady Irwin College is taking commendable initiatives towards energy conservation and management, stressing on optimal utilization of resources. The staff and students of college have moved towards a greener lifestyle for energy conservation.

The college has taken the sustainable agenda of the government forward by generating solar energy and reducing the carbon footprint of the city and nation as a whole. The 218 kWp SPV project was successfully installed in the year 2020. The solar plant is generating about 3 lakh units of power each year, leading to substantial savings for the college by reducing college's energy bills. The solar plant has been net-metered by NDMC, thereby ensuring that the power generated by the plant is fed into the grid. The college is not only generating green energy but also reducing its dependence on coal-based energy.

7. CAPACITOR BANK

Sl. No.	Identification	Capacity in KVAR
1	Sub station	NA

******** END OF THE REPORT ********