



Dasmesh Girls College

(Affiliated to Panjab University - Chandigarh)



DASMESH GIRLS COLLEGE MUKERIAN

ENERGY AUDIT REPORT

2022-2023

**PREPARED BY
EHS ALLIANCE SERVICES**

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CERTIFICATE



CERTIFICATE

PRESENTED TO

DASMESH GIRLS COLLEGE MUKERIAN

Chak Alla Baksh, G.T. Road, Distt- Hoshiarpur, Mukerian, Punjab 144211

The above institution has been assessed by EHS Alliance Services for the comprehensive study of Energy Audit on institutional working framework to fulfill the requirement of

ENERGY AUDIT

ACADEMIC YEAR 2022-23

The energy-saving initiatives carried out by the institution have been verified as per ISO 50001:2018 standards 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 institution and sustainability are highly appreciated and noteworthy.


SIGNATURE



10.08.2023
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Dasmesh Girls College for assigning this important work of environmental audit. We appreciate the cooperation of the teams for the completion of the assessment.

First of all, we would like to thank ***Dr. Karamjit Kaur- Principal*** for giving us an opportunity to evaluate the environmental performance of the campus.

We would also like to thank, ***Ms. Renu Gupta - Assistant Professor & Member, SAP and Audit Coordinator*** for her continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members actively involved in collecting the data and conducting field measurements.

We are also thankful to

Dr. Meetu - ***Assistant Professor and Chief Coordinator, IQAC***

Dr. Maninder - ***Assistant Professor and Coordinator, IQAC***

Ms. Satwant Kaur - ***Assistant Professor & Member, SAP and Nodal Officer***



DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Dasmesh Girls College Mukerian 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 the 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 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.

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Vijay Singh
Lead Auditor EMS & Energy



Dr. Uday Pratap
Co-Auditor EMS & Energy

ABBREVIATION

A	Amps
AC	Air Conditioner
AC	Alternating Current
AMET	Academy of Maritime Education and Training
CFL	Compact fluorescent lamp
CIP	Comprehensive Inspection Program
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

OVERVIEW OF THE COLLEGE

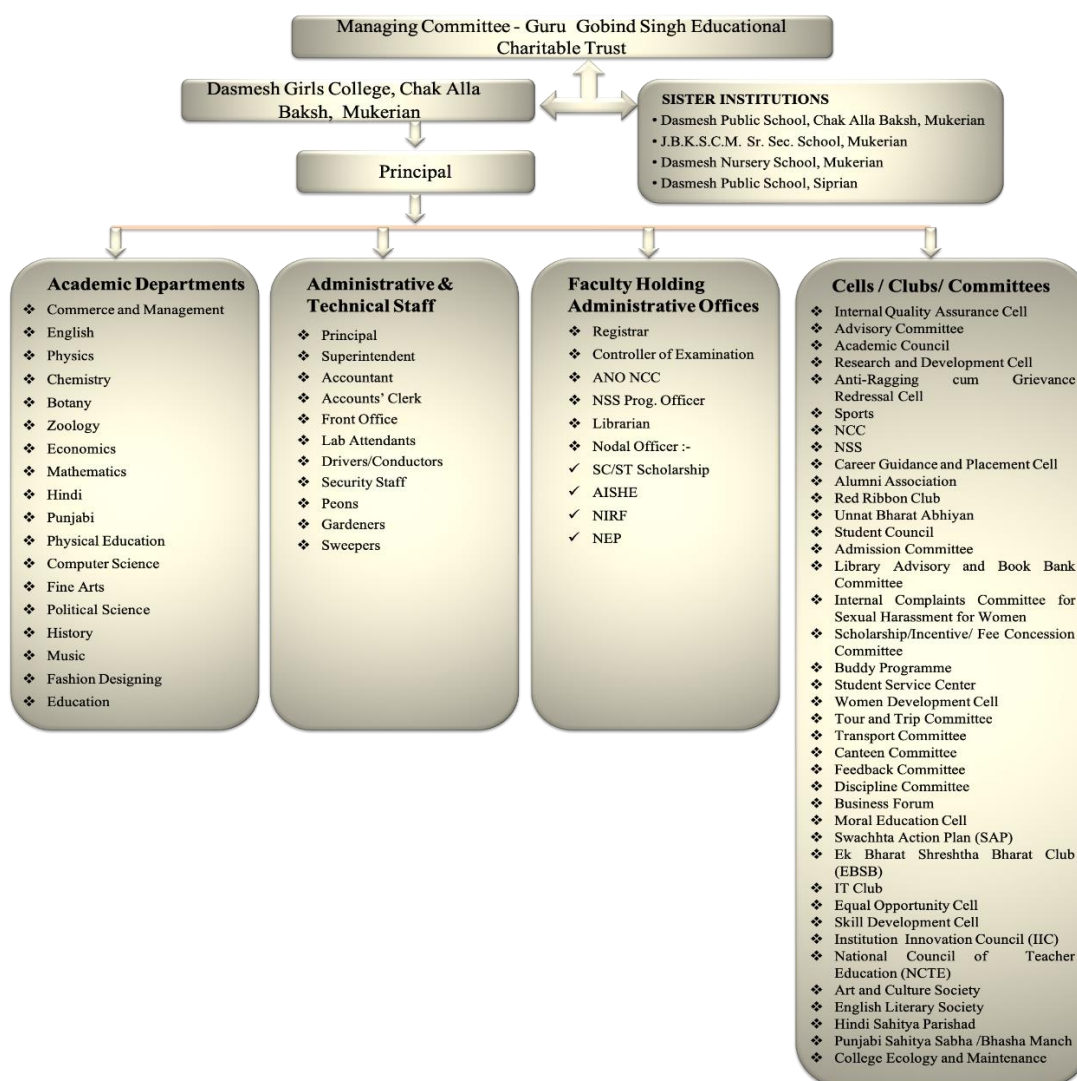
Dasmesh Girls College, an eternal link in the immortal chain of Sri Guru Gobind Singh Educational Trust, Chak Alla Baksh, Mukerian was established in December 2000. It is an institution where learning is a religious habit. It aims at imparting value-based education. This seat of learning has been enunciating the gospels of Guru Gobind Singh in particular and the message of humanity in general. The custodians in the field of education and the great philanthropists of the area got their dream materialised when they came forward with their mission of establishing the institution in the cradle of nature.



The growth of the College became phenomenal when they contributed their might along with Sardar Prakash Singh Badal, the Chief Minister, who showered his bounteous blessings on it on December 21, 2000. Since then this institution is inculcating the code of discipline and morality among students. The college combines a commitment to teaching excellence with extensive sports and cultural opportunities. The academic and cultural activities are focused on inculcating a strong sense of commitment to nationalists i.e. social and aesthetic values. Seminars, workshops, conferences, and exhibitions are a regular feature of its UG / PG Departments. The institution is making every possible effort to uplift the poor and downtrodden section of the area by educating their women folk and encouraging them to realize their potential to face mind-boggling situations in the globalized world. Dasmesh Girls College is housed in a spacious pollution-free, picturesque, and lush-green campus at a convenient distance

from the town. A sense of splendor, beauty, discipline, and academic excellence pervades the corridors of the campus. At present, the College is having four-storied blocks, viz., Arts cum Administrative Block, Mata Gujri Block, Mata Sundri Block, and Bhai Gurdas Block. The college has four sophisticated computer labs, a language lab, a Psychology lab, Mathematics lab, a Physics lab, a Chemistry lab, a Zoology lab, a Botany lab, Conference Room, a Seminar Hall, and Smart classrooms with all modern infrastructure required for extending quality-education to the students. The college library is the life and soul of this institution. It is fully computerized for various operations viz., Acquisition of books, cataloging, classification, transaction (issue and return), inquiry etc. This college is being managed by the experienced members of the committee. Under the innovative leadership of its Principal Dr. (Mrs.) Karamjit Kaur, herself a dazzling luminary in the field of education, this college is marching from strength to strength. The College is progressing by leaps and bounds. The visit of the NAAC peer team proved to be a boon for the college. The college is Accredited 'A' Grade by NAAC which has further boosted its credibility in the region. The College has been awarded Best NSS Unit among the Colleges in the state of Punjab. The College has run NSS, NCC, and Red Ribbon Club for the betterment of the students.

Organizational Chart



MISSION:

- ✓ To broaden horizon and enrich life of the women.
- ✓ To develop cultural sensitivity and global understanding.
- ✓ To make women competent professionals in the present cut – throat competition.
- ✓ To compete effectively in today's environment for ensuing future.
- ✓ To get job opportunities and earning potentials.
- ✓ To be in the forefront of development of a nation.
- ✓ To inculcate discipline and culture.
- ✓ To enhance employability through innovative methods.
- ✓ To inspire the students to imbibe the virtues of hard work, perseverance and to develop a Positive attitude.

VISION:

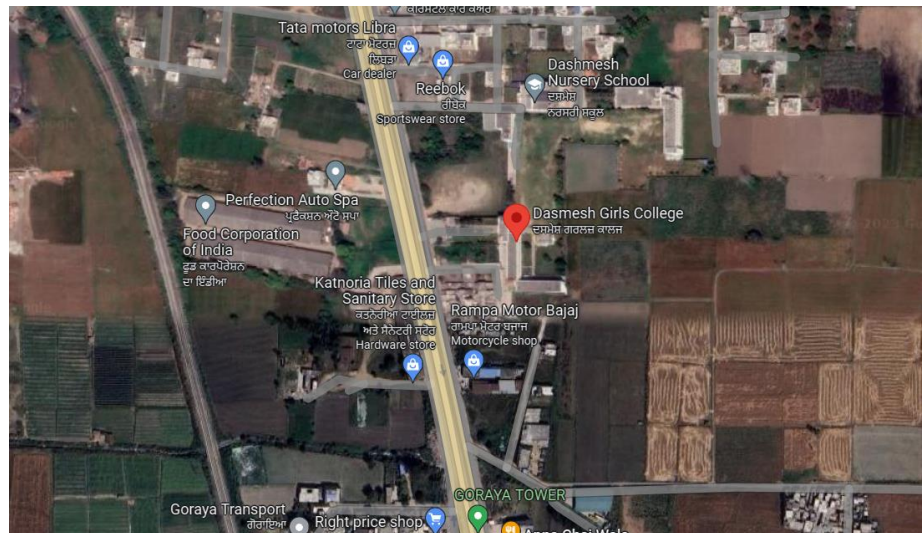
With the purpose of emancipating women as also to educate them, Sri Guru Gobind Singh Educational Trust (Regd.), Chak Alla Baksh, Mukerian founded an institution, Dasmesh Girls College, Chak Alla Baksh, Mukerian, in the year 2001. Disseminating the philosophy of Guru Gobind Singh 'Shubh Karman te Kabhun na Tarun' (May I never refrain from the righteous acts), the college has a strong commitment to excel so that the leaders grow up to be fine human beings and are able to assume positive and fulfilling role in nation building and promoting a culture of peace and non-violence. Dasmesh Girls College is an institution where learning is a religious habit. It aims at imparting value-based education. This seat of learning has been enunciating the gospels of Guru Gobind Singh in particular and the message of humanity in general. This institution is making every possible effort towards changing the life of poor and down-trodden of the area by educating their women folk. With its roots deeply couched in Sikh-Culture and Indian Tradition, the institution is receptive to the winds of change and responsive to regional, national and global aspirations. The college earnestly endeavours to enrich and empower all its beneficiaries through value-based, quality- education. Through positive and fertile teaching-learning environment, based on the principle of caring, it aims at sharing peaceful co-existence. The college is consistently engaged in the promotion and revival of Indian tradition, culture, heritage and spiritual philosophy through co-curricular, cultural activities, classroom presentations, learning discourses and awareness-raising programs. The college envisions the creation of multi-dimensional Personality Development Programmes through college curriculum and to produce world-class professionals.



GOAL & OBJECTIVE

- ✓ To train students with a view to develop their overall personality.
- ✓ To focus on students, to develop student-centric teaching and to make learning a happy and Joyful experience.
- ✓ To maintain good academic standards through effective teaching and learning methods.
- ✓ To sensitize the students regarding issues of contemporary relevance and guide them to Emerge as responsible citizens of the society.

Geo Location
Geo Coordinates from Google maps:
31.9357594, 75.6193359



AUDIT PARTICIPANTS

On behalf of the college

Name	Designation
Dr. Karamjit Kaur	Principal
Dr. Meetu	Assistant Professor and Chief Coordinator, IQAC
Dr. Maninder	Assistant Professor and Coordinator, IQAC
Dr. Rajwinder Kaur	Assistant Professor & Member, SAP
Dr. Maninderjit Kaur	Assistant Professor & Member, SAP
Ms. Renu Gupta	Assistant Professor & Member, SAP & Audit Coordinator
Dr. Sukhwinder Kaur	Assistant Professor & Member, SAP
Ms. Suman Devi	Assistant Professor & Member, SAP
Ms. Satwant Kaur	Assistant Professor & Member, SAP & Nodal Officer
Ms. Monica	Assistant Professor & Member, SAP
Ms. Neena Rishi	Assistant Professor & Member, SAP
Dr. Ekta	Assistant Professor & Member, SAP

On behalf of EHS Alliance Services

Name	Position	Qualifications
Mr. Vijay Singh	Lead Auditor	<i>M.Sc. M. Tech (Environment Science & Engineering), Energy Auditor, Post Diploma in Industrial Safety Management</i>
Dr. Uday Pratap	Co-Auditor	<i>Ph.D., EMS: Lead Auditor ISO14001:2015, QCI-WASH</i>



EXECUTIVE SUMMARY

The purpose of this Energy Audit was to seek opportunities to improve the energy efficiency of the Dasmesh Girls College Mukerian. Reducing energy consumption despite improving 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 to common appliances have been shared which may help reduce energy consumption. Data collection for the energy audit of the campus was carried out by the EHS Alliance Team. The Energy Audit Report accounts for the energy consumption patterns of the institution on actual surveys and detailed analysis during the audit.

The work comprehends the area-wise consumption traced using suitable equipment. Our team carried out the analysis with the support of the staff members from Dasmesh Girls College Mukerian. The report provides a list of possible actions to preserve and efficiently access the available sources, and resources, and their saving potential was also identified. We look forward to optimization that the authorities, students, and staff members will 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 Dasmesh Girls College Mukerian.

ENERGY AUDIT - ANALYSIS

1. ENERGY CONSUMPTION

To understand the Energy Consumption trends and to analyze the average monthly consumption we have collected electricity energy bills from July 2022 to June 2023

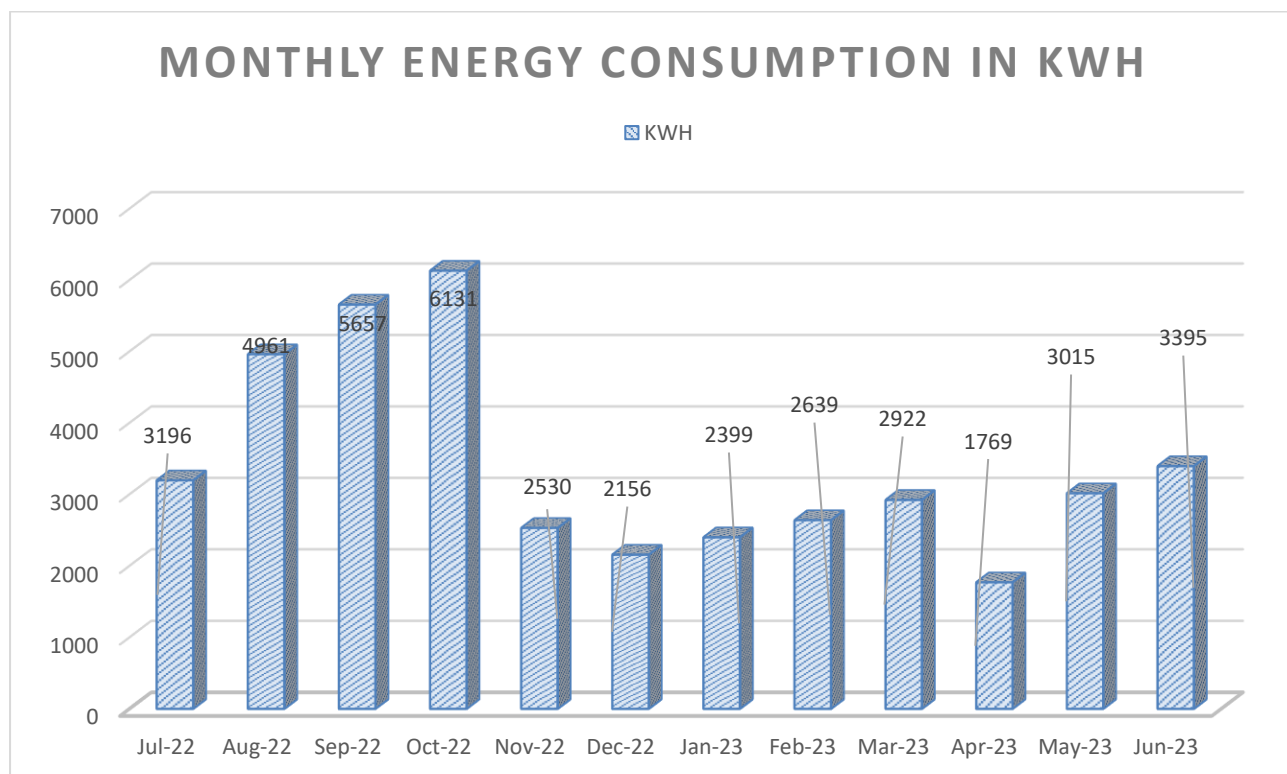
The details of “**Meter Connection**” at “**Dasmesh Girls College Mukerian**” are as follows-

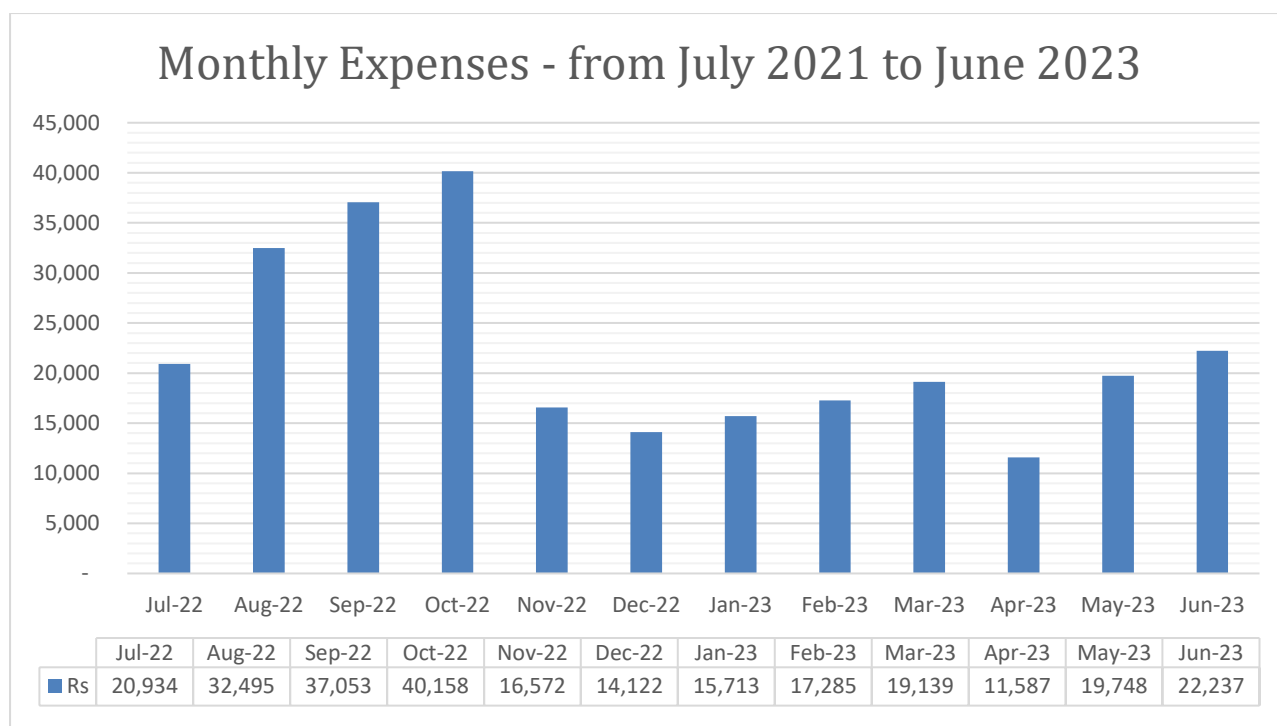
Name	-	M/s SEC Dasmesh
CA No.	-	3007360397

1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

To understand the Energy consumption trend and to develop the baseline parameter we have collected monthly energy bills for the 12 months i.e. from July 2022 to June 2023

Month	Grid Billing	Solar PV	Total Readings	Rate INR	Amount in INR
Jul-21	3196	0	3196	6.55	20,934
Aug-21	4961	0	4961	6.55	32,495
Sep-21	5657	0	5657	6.55	37,053
Oct-21	6131	0	6131	6.55	40,158
Nov-21	2530	0	2530	6.55	16,572
Dec-21	2156	0	2156	6.55	14,122
Jan-22	2399	0	2399	6.55	15,713
Feb-22	2639	0	2639	6.55	17,285
Mar-22	2922	0	2922	6.55	19,139
Apr-22	1769	0	1769	6.55	11,587
May-22	3015	0	3015	6.55	19,748
Jun-22	3395	0	3395	6.55	22,237
SUM	40770	0	40770		267044

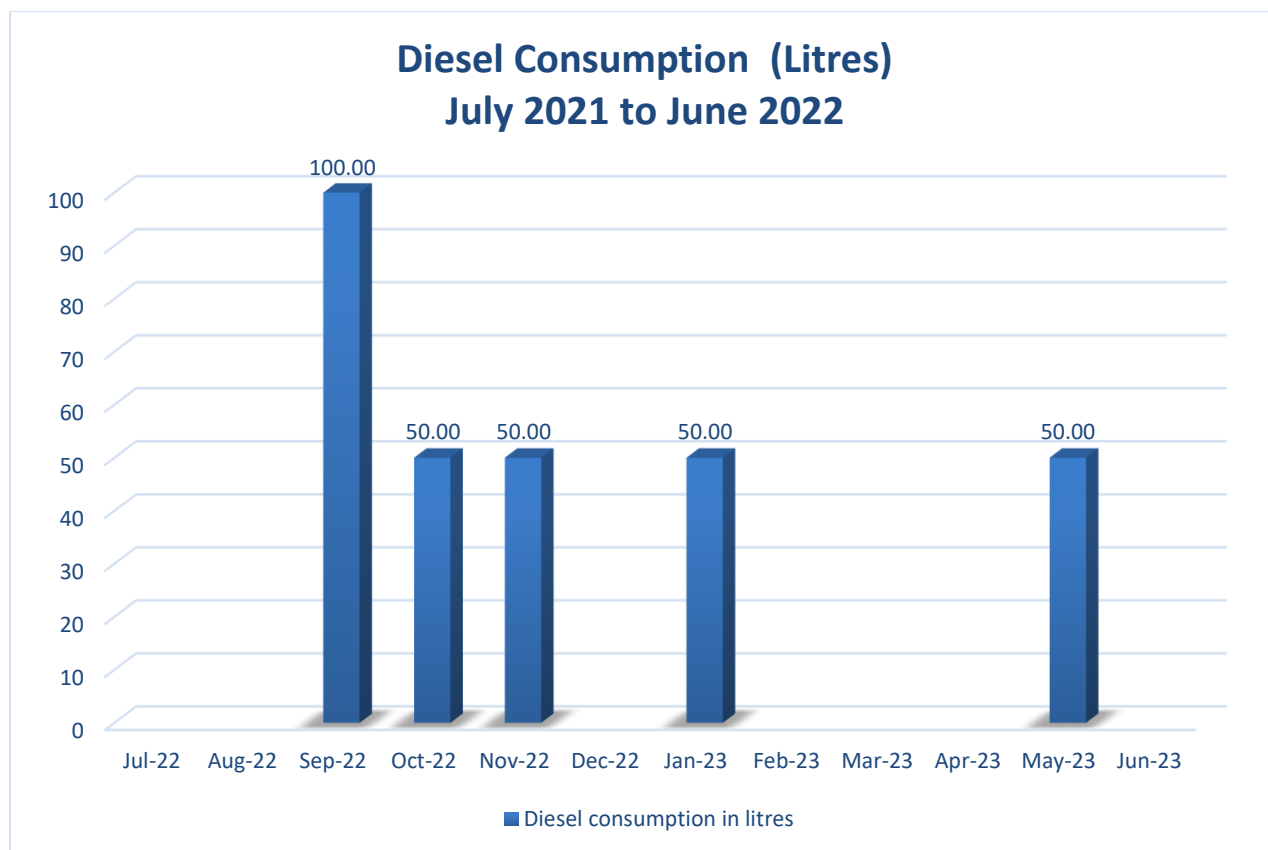




2. DIESEL CONSUMPTION

Below are the diesel consumption details in liters from July 2022 to June 2023.

Period	Diesel consumption (in litres)
Jul-22	0
Aug-22	0
Sep-22	100.00
Oct-22	50.00
Nov-22	50.00
Dec-22	0
Jan-23	50.00
Feb-23	0
Mar-23	0
Apr-23	0
May-23	50.00
Jun-23	0
Total	300.00



3. ANALYSIS OF DG SETS

In the campus, there is only one Diesel Generator (DG) set for its electrical power needs in case of Grid power failure. DG sets capacity are 125 kVA and 2 kVA.

DG Set Design Details			
Description	Unit	DG at Station 1	DG at Station 2
Rated capacity	kVA	125	4
Hz		50	50
Sl No.		06.15/15-16/007	6.07/07-08/000
Make		Koel Green	Power Drive
Volts	Volts	415	415
PF		0.8	0.8
Phase		3	3
RPM		1500	1500
Amps	Amps	174	5.7
Mfg.		June 2015	June 2007

DG Set Operation details		
Operating hours during testing	Hours	0.50
% Loading	%	63.73
Energy Generation	kWh	34.21
Load	kVA	91.73
Fuel consumption during testing	Litre	10
Specific energy generation	kWh/litre	3.21

Observation and Suggestions: -

Soundproof silent generators are an efficient tool to keep noise and vibration low. For the power backup of the institution, the soundproof model is installed near the herbal garden of the institution.

As per the trial taken during the energy audit, the percentage loading of DG set is 63.73% which is ok and the specific energy consumption of DG Sets is 3.21 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.

We recommend the college initiate a periodic maintenance schedule and stack monitoring of the DG set through an authorized lab.



4. AC SYSTEM

Energy Efficiency Ratio (EER): The performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's cooling Capacity (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 above TR is also called air-conditioning tonnage.

There are Split and Window ACs installed in Dasmesh Girls College Mukerian in various areas of various capacity which detail is given below: -

Sl No	Location/Identification	Type (Window/Split)	Qty.	TR Rating	Room Temp. (°C)	AC-Tout (°C)	AC-Tin (°C)	Room-RH (%)	Area (m ²)	Air velocity (m/s)	Enthalpy Hout	Enthalpy Hin	Heat Load in TR	KW supplied	(Eff.) Power per Ton (KW /TON)	EER
1	Mata Gujri Block-Ground Floor	Split	6	1.5	24	10	18	52	0	2.4	24	37	0.4	0.5	1.5	2.3
2	1st Floor	Window	5	1.5	23	12	20	52	0	2.3	25	38	0.3	0.6	1.7	2.1
3	Library Block-Dining Room	Window	1	1.5	24	10	18	52	0	2.4	24	37	0.4	0.5	1.5	2.3
4	Library/Multi purpose Hall	Split	3	1.5	23	12	20	52	0	2.3	25	38	0.3	0.6	1.7	2.1
5	Mata Sundri Block-Ground Floor	Window	1	1.5	24	10	18	52	0	2.4	24	37	0.4	0.5	1.5	2.3
6	2nd Floor	Split	1	1.5	23	12	20	52	0	2.3	25	38	0.3	0.6	1.7	2.1
7	1st Floor	Window	1	1.5	24	10	18	52	0	2.4	24	37	0.4	0.5	1.5	2.3
		TOTAL	18													

Remarks: - We have checked the Energy Efficiency Ratio of ACs and the EER of ACs is fairly OK. But in the future, you should purchase 5-star rated inverter-based split ACs because the power consumption of inverter-based BEE 5-Star rated ACs is less than non-star rated ACs. Also, we recommend Dasmesh Girls College Mukerian to organize a periodic maintenance schedule and take corrective actions for insulating AC's refrigerant lines in order to protect against energy losses.



5. CEILING FANS ANALYSIS

In the Dasmesh Girls College Mukerian, there are 457 fans installed, all ceiling fans are 60W. The observations and suggestions are given below.

Sl No.	Location/Identification	Ceiling Fan-60W
1	Mata Gujri Block-Ground floor	46
2	1st floor	66
3	2nd floor	65
4	Mata Sundri Block-Ground Floor	73
5	1st Floor	61
6	2nd floor	64
7	Library Block- library	18
8	Canteen	18
9	Multipurpose Hall	22
10	Top Floor	22
11	Dining Room	2
	TOTAL	457

Observation and Suggestions: -

In the college, all the ceiling fans are 60 W but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. We recommend replacing BEE 5 Star rated 30W fans.

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

6. ANALYSIS OF LIGHTING SYSTEM

6.1 Brief description of the existing system

For assessing the energy efficiency of the lighting system, an 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 the working level have been done.

6.2 Inventory of Lighting

Sl. No.	Location/ Identification	09W LED	40W Tube light
1	Mata Gujri Block- Ground Floor	17	7
2	1st Floor	22	8
3	2nd floor	21	3
4	Mata Sundri Block	26	
5	1st floor	23	
6	2nd floor	21	
7	library Block- Library	8	
8	canteen	9	
9	Multipurpose Hall	8	
10	Dining Room	4	
11	Top Floor	8	
	TOTAL	167	18

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

The college has initiated an LED-based lighting solution. LEDs save energy, the life span is much greater, and emit virtually no heat. We recommend replacing the tube lights with LEDs.

Additionally, we recommend installing motion sensor-based lights in common areas such as libraries, washrooms, corridors, etc.

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

7. OTHER POWER CONSUMPTION

7.1 Inventory of IT Infrastructure

Sl No.	Location/Identification	160W Exhaust Fan	Water Cooler-200W	180W-Circulating Fan
1	Mata Gujri Block	6	4	4
2	Mata Sundri Block	5	3	
3	Library block- Canteen	2	1	

7.2 Water pump details

Sr. No	Description	Unit						
			Pump No.-1	Pump No.-2	Pump No.-3	Pump No.-4	Pump No.-5	Pump No.-6
1	Rated Power of Motor	KW	0.746	0.746	0.746	0.746	0.746	0.746
2	Motor Eff.	%	26.5	26.5	26.5	26.5	26.5	26.5
3	Discharge Head	m	27m	27m	27m	27m	27m	27m
4	Suction Head	m	23.6m	23.6m	23.6m	23.6m	23.6m	23.6m
5	Pump Type	Submersible/ Monoblock/ Centrifugal Etc.	Submersible	Monoblock	Mono block	Mono block	Submersible	Monoblock

7.3 Exhaust fan details

Sl No.	Location/Identification	160W Exhaust Fan	Water Cooler-200W	180W-Circulating Fan
1	Mata Gujri Block	6	4	4
2	Mata Sundri Block	5	3	
3	Library block- Canteen	2	1	

ANALYSIS

There should be a regular maintenance schedule for equipment like pumps, exhaust fans, and IT equipment. Electronics such as computers, printers, scanners, etc. more than 3 years or 5 years (as per their life) should be replaced with new computers/laptops. Ideal Temperature should be maintained for all electronic appliances.

8. CAPACITOR BANK

S. No	Capacity in KVAR	Quantity
1	N/A	



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