ENERGY AUDIT

STUDY PERIOD (TWO YEARS) 2019 – 2020 AND 2020 - 2021

Sustainability study

AUDIT REPORT

Studied for

Swami Shukdevanand College

Mumukshu Ashram, Shahjahanpur (U.P.) 242226

Studied in the capacity of
An accredited & Certified Green Building Professional

Studied by

Greenvio
Solutions

Valid till May 2023

Disclaimer

The Audit Team has prepared this report for the **Swami Shukdevanand College** located at _Mumukshu Ashram, Shahjahanpur (U.P.) 242226_ based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

These can be implemented phase wise or as a whole depending on the decision taken by the Hon'ble Management and College. The warranty or undertaking, expressed 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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The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who has completed audits of multiple Institutes including Technical, State University, Private University and Single Faculty Colleges for a total of more than 60 lakhs+ sq. ft. of Built-up area audited till date Pan India as an Accredited and Certified Green Building Professional-Architect; ISO Certified I.A. (IMS). Green Building consultancy is her forte and she is one of the most sought after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

Greenvio Solutions

Developing Healthy and Sustainable Environments
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Acknowledgement

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Our special thanks are due to **Swami Chinmayanand Saraswati,** President; **Shri. Ramchandra Singhal,** Vice President; **Dr. A. K. Mishra,** Secretary; **Dr. A. Massey,** Joint Secretary and everyone from the Management.

Our heartfelt thanks to Chairperson of the entire process **Dr. Anurag Agarwal,** Principal for the valuable inputs.

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Sustainable Academe

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Contents

1. Introduction

1.1 About the Institution

Swami Shukdevanand College, started with BA first year classes, and within a short span of time it touched the great heights of development, the B. Ed classes were started in 1965 in the college.

The same year B. Sc. classes were also added to the institution. With the glorious talent show in the field of Arts, Science and Education, the institute continued its journey for years. The efforts of the new management committee bore fruits with the addition of B. Com courses in 1985. The college got the permission from the government to run M. Ed. and M. Com courses.

A complete new look was given to the library and reading room in 2003, when it was constructed with all the facilities. Various lecture halls, lecture theatres, and indoor stadium were built in the year 2004 and were inaugurated on February 26, 2006, by the ex-president of NCERT, Dr. J.S. Rajpoot, and the then director of higher education, Dr RK Baslas.

Administrative building of the college was renovated in 2004-2005. The college got the approval for botany and zoology subjects from the university and started its classes from 2006-2007. Staff room for arts and commerce faculties, 14 lecture halls on the second floor and other important halls were constructed in 2007-2008.

PGDCA and BCA classes were started from July 2008. BP Ed classes are also under proposal. New laboratories for Chemistry, Zoology and Botany have been constructed and other lecture halls are under construction.

Beautification work for the college remains constantly under progress. In the year 2009, BBA Program was commenced. Besides, B.Com (Finance) and B.Com. (Hons.) programs ware also started in the year 2013. After two years in 2015, seven postgraduate courses in Arts streams and Five Postgraduate courses in Science stream were launched. And recently in the year 2016, one more self-financed unite of B.Ed. was started in the college.

The college takes pride in proclaiming that each year; many students of the college take Chancellor's medal.

1.2   Statements of the Institution

1.2.1 Vision

The College has envisioned "Being a dynamic organisation contributing to a transformed, equitable and quality higher education and training system in India."

1.2.2 Mission

The College adheres and focuses to the following mission:

- ➲ *To Ensure and sustain high quality value based Education*
- ➲ *To inculcate values of lifelong learning develop their unique and innovative ideas.*
- ➲ *To mould the youth into a self-reliant and responsible citizen.*

1.3   The surrounding premises around the Institution

The Premises is situated amidst the landscape serene of **Shahjahanpur district of Uttar Pradesh** with immense peace and calmness in the surroundings. There is a frontal approach which provides quite a beautiful appreciation space while approaching the premises; this area is surrounded by huge trees which positively complement the background-foreground aspect in terms of Natural space and built-form Architecture. It also provides ample shade which enhances the micro climate of the region. The location of College is feasible to the nearby essential amenities such as Public Health Center, Fire Station, Civic body-Public administrative buildings, Recreational gardens and Police Station which are not too close but nearby.

1.4   Assessment of the College

1.4.1 Affiliations

The College has all its courses approved and affiliated to **the Mahatma Jyotiba Phule Rohilkhand University,** a government university in Uttar Pradesh, India and the premises is spread over 206 acres.

1.4.2 Certification

- ➲ **AISHE –** The College has the AISHE Code *C-13367-2020.*

➲ **ISO –** The University is *9001:2015 Certified for Quality Management System from SP Certification Limited in March 2022.*

1.4.3 Recognition

The College is recognised by **University Grant Commission (UGC)** under section 2 (f) and 12 (b) of the UGC Act, 1956 vide by University Grants Commission, New Delhi.

1.4.4 Accreditation

The College received 2.53 CGPA with a 'B+' Grade in its First cycle of NAAC in October 2006. The College is due for its second cycle of NAAC soon.

1.5   Achievements of the Institute

The College has a tremendous track record of excellence for the educational services provided; it received the **"Swachhta Action Plan Award   for 2021-22"**

2. Institution overview

2.1 Populace analysis for Academic year 2020-2021

2.1.1 Students data

The student data (shared by the College) shows there were a total of **3,654 Boys and 2,226 Girl students,** thus there were **a total of 5,880 students** on the premises.

2.1.2 Staff data

Type	Male	Female	Total
Admin staff	13	1	**14**
Teaching staff	51	24	**75**
Non-Teaching staff	33	9	**42**
Total Staff Members	**97**	**34**	**131**

Table 1: Staff data of the Institution for 2020-2021

The staff data shows the premises had a total of **131** Staff Members.

2.2 Populace analysis for Academic year 2019-2020

2.2.1 Students data

The student data (shared by the College) shows there were a total of **3,117 Boys and 2,074 Girl students,** thus there were **a total of 5,191 students** on the premises.

2.2.2 Staff data

Type	Male	Female	Total
Admin staff	14	1	**15**
Teaching staff	51	24	**75**
Non-Teaching staff	33	9	**42**
Total Staff Members	**98**	**34**	**132**

Table 2: Staff data of the Institution for 2019-2020

The staff data shows the premises had a total of **132** Staff Members.

2.3   Total College Area & College Building Spread Area

The **total site area is 6.17 Acres** and the **total Built-up area of College is 1,87,260 sq. ft.** for **a total of 6,011 footfalls.**

2.4   College Infrastructure

2.4.1 Establishment

The College was established in 1964. The college is located pretty close to nature and hence has very fresh environment which is absolutely pollution free and healthy. The Building is a Reinforced Cement Concrete (RCC) framework building. **Overall the Infrastructure of the Building is excellent in terms of the Architecture Design and Green Building Design. The Premises covers quite a few of the requirements for a Green Habitat.**

2.4.2 Spatial Organisation

The overall ambience of the College is warm and inviting. The classrooms and other spaces have ample natural ventilation in the form of clear glass windows with fresh air ventilation. The architecture of the building is quite well designed. The colour palette not just helps the building to stand out but also provides an Institutional arena. It balances with the local architecture with the natural landscapes of huge trees all around. The design emphasis on providing calmness to the built form and gradually merges with the serene landscape. The floor to floor height is more than 11 feet. There is no provision for lifts in the premises, whereas there are amenities such as CCTV, Fire extinguishers, Library and first aid box.

2.4.3 Operation and maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarized in the table. The Institution is open from Monday to Saturday. The detail wise timing for each is mentioned below.

S. No.	Section	Days	Time	Hours/ day	Days in a year
1	Teaching	Monday to Saturday	09.00 am to 03.00 pm	6	280
2	Non-teaching	Monday to Saturday	10:00 am to 05:00 pm	7	280

Table 3: Schedule of the timings of the premises

3. Green Building Study Audit

3.1 About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution a sustainable and healthy premises for its inhabitants.

3.2 Analysis for the Green Building Study Audit

The procedure included detailed verification for the following:

Energy Audit
- Analysis of the Lights, Fans, AC, Equipment
- Renewable energy
- Scope for reducing the current energy bills if any
- Improvement in the thermal comfort of the premises

Green Audit
- Green initiatives
- Hygiene audit
- Water Audit - Analysis of the current water consumption of premises; Scope to include Rain water harvesting and Waste water treatment in premises
- Waste Audit - Current waste produced, its segregation and usage; Strategies to be adopted for waste management and awareness

Environmental Audit
- Analysis of the current landscape + hardscape of campus
- Analysis of the flora and fauna of campus
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of the premises.

3.3 Strategy adopted for Green Building Study Audit

The strategies included data collection from admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collected and preparation of the Report.

3.4 Timeline of the activities for Green Building Study Audit
- 11 April 2022   – Allotment and Initiation by the College
- 12 April 2022   – Induction meeting
- 05 May 2022   – Survey of the Student and staff submitted
- 12 May 2022   - Site visit at the Institute
- 12 May 2022   – Submission of the report

Discussion session with the Management, Principal and College Faculties

On-site review with the Team

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4. Energy Audit

4.1   Sources of Energy consumption

The premise uses following sources of energy consumption.

4.1.1 Primary sources

⇒ **Electrical (Metered) –** Light, Fans, Equipments, Pumps comprise these sources.

⇒ **Renewable energy –** There are sources of renewable energy available.

4.1.2 Secondary sources

The sources are listed below (Department and location wise)

S. No	Department	Gas Cylinders	UPS	Inverter	Battery
1	Block A+B	3	1	6	8
2	Block C+D	1	50	2	3
3	Block E+F	-	1	-	-
4	Admin Block	-	6	1	2
5	Women HOSTEL UGC	-	-	3	6
6	Physical Education Dept.	-	1	-	-
7	Central Library	-	6	1	2
8	N.C.C Room	-	1	-	-
Total		**4**	**66**	**13**	**21**

Table 4: Details of the secondary sources in the premises

4.2   Site investigation analysis

The Site investigation observations and interviews with the Maintenance staff, Electrical department in charge are summarised below:

- The **switch-off drills are practised at present,** the maintenance staff and Lab Attendants put off switches of all equipments regularly.

- All the **computers are shut-off after use** and also put on power saving mode.

- There are **display boards encouraging staff and students to save energy are put up in the classrooms and laboratories**.

- Ultra violet lights are used only in the scientific laboratory for a certain amount of time. Apart from this space no other space has the usage of any harmful lights.

4.3   Actual Electrical Consumption as per Bills

The admin department had shared the bills for Meter which is connected to the Building and is the main source of energy supply. The details of unit consumption meter wise stated there were around 6,069 units consumed for Rs. 86,197/-

S. No.	Month	Year	Unit Consumed	Amount
1	May	2021	4,025	55,626
2	June	2021	2,705	45,521
3	July	2021	5,885	72,000
4	August	2021	9,936	1,24,876
5	September	2021	6,681	88,796
6	October	2021	8,881	1,02,766
7	November	2021	10,288	1,32,395
8	December	2021	4,475	59,420
9	January	2022	1,115	1,19,038
10	February	2022	2,702	43,587
11	March	2022	5,889	72,016
12	April	2022	10,245	1,18,320

Table 5: Details of the electrical consumption

The summary of the above study shows the average consumption varies for each month.

4.4   Survey Results

An online survey was conducted to analyse the student and staff views about the Energy management practices adopted in College, following is the result received.
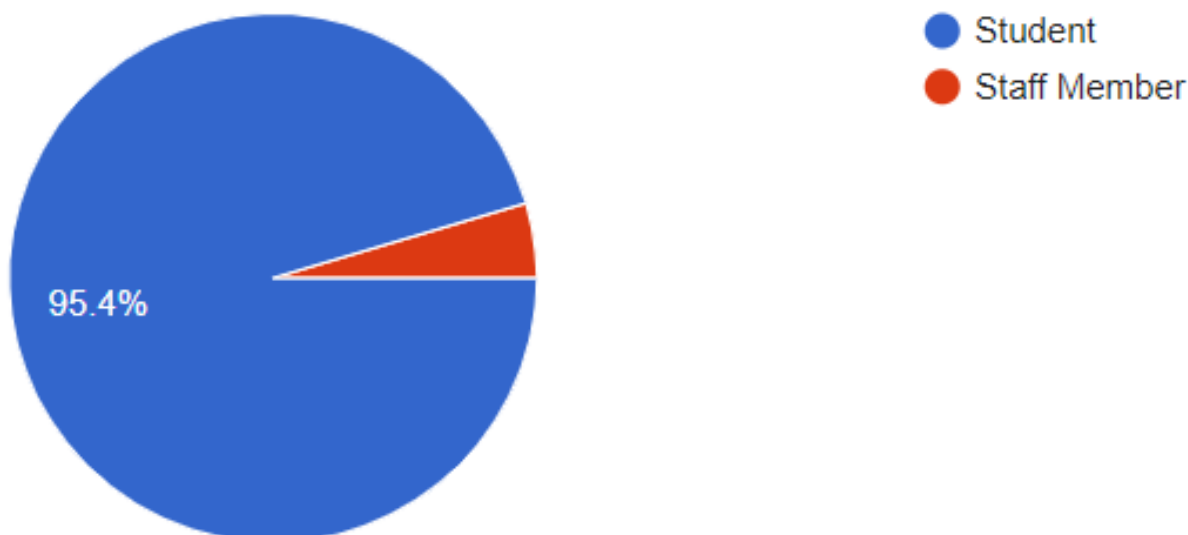
4.4.1 Participation

Figure 1: Participation analysis in the survey

A total of **1,094 responses** were received out of which 95% were students.

4.4.2 Review of the Energy management practices in the premises

Note: The Participants were asked to review the practice on a scale of 1-5 with scale components as follows:

- Scale 1 – Poor

- Scale 2 – Satisfactory

- Scale 3 – Good

- Scale 4 – Very good

- Scale 5 – Excellent

The figures in each of the columns of graph depict the Number of participants responses in numerical (Percentage of the participant response) – For example 101 responses (44.5%)
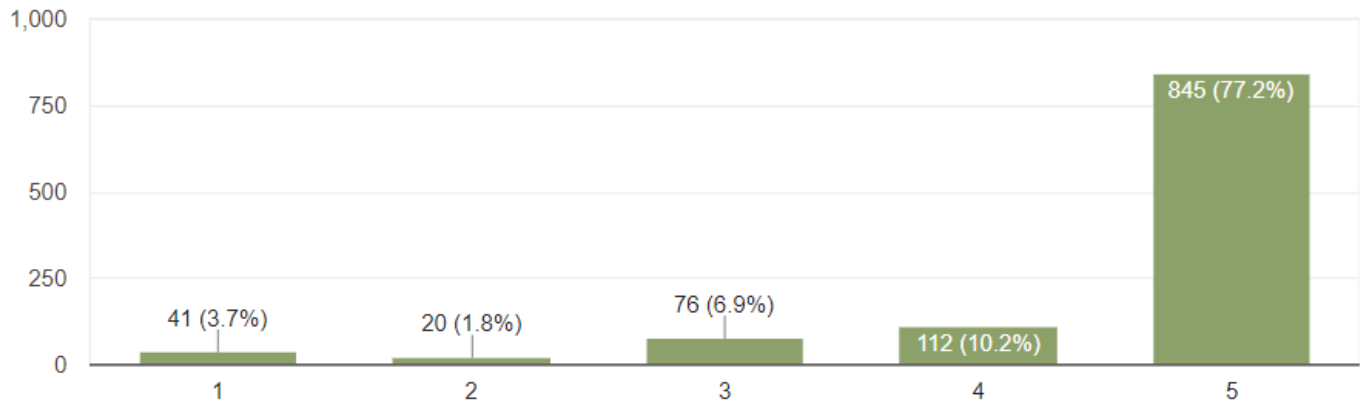
Figure 2: Energy management practices in college

The students, staff **(almost 77%) of the responses found the practices to be excellent (rating 5)** and **10% of the responses found practices to be very good (rating 4).**

4.5 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff. The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise in summarised in the following sections. Note: The following analysis is combined for entire premise taking into considerations the duration before pandemic to understand the consumption pattern as post pandemic the premise is used only for a few hours.
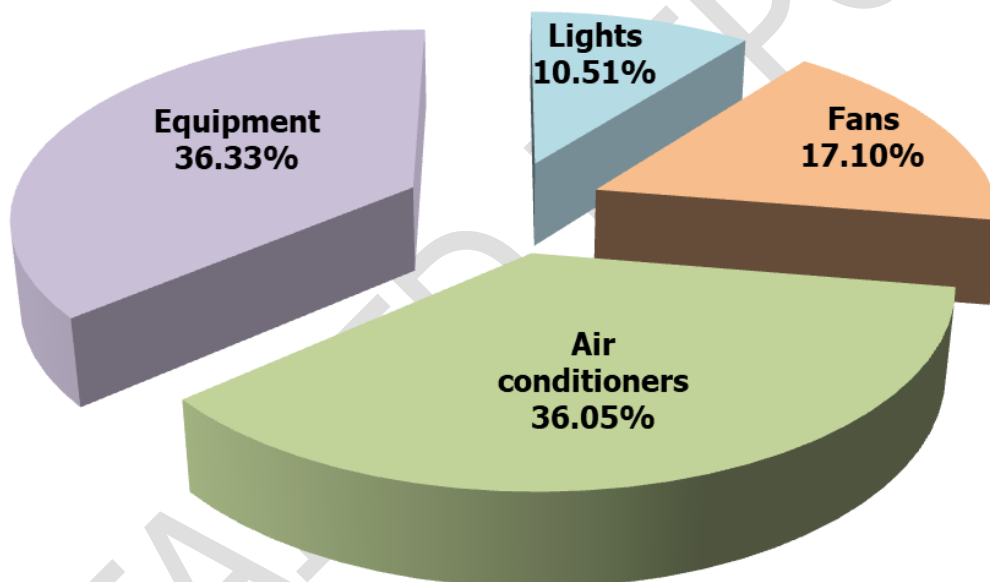

Figure 3: Summary of the calculated electrical consumption as per inventory

The above graph shows that equipment consumes 36.33%; air conditioners consume 36.05% while the fans consume 17.10% and the lights consume 10.51% of the total calculated electrical energy.

4.6   Lights

4.6.1 Types of lights based on the numbers

There are a total of **1,301 lights in the premises;** the following table shows the various types of lights in the premises.

S. No.	Type	Nos.
1	CFL	661
2	Halogen	15
3	Mercury Light	2
4	Non-LED	9
5	LED	614

Table 6: Summary of the types of lights in premise

4.6.2 Types of lights based on the power consumption

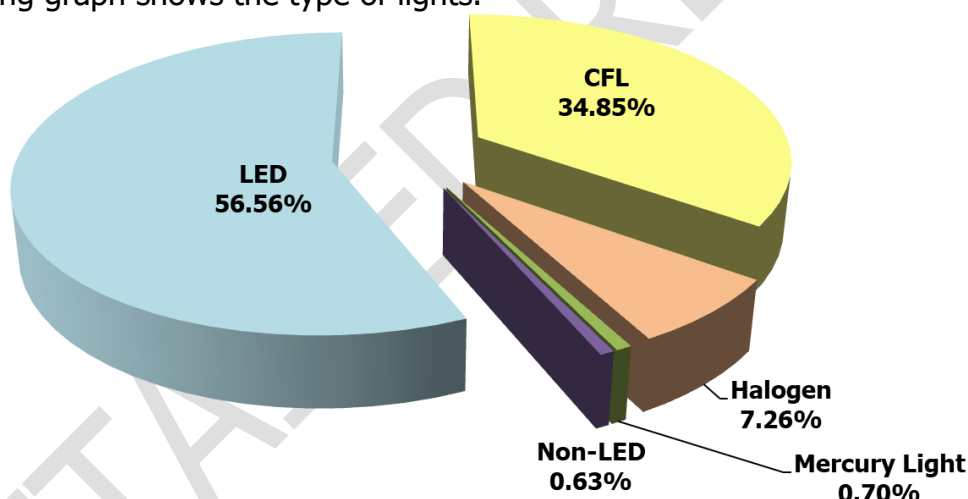The following graph shows the type of lights.

Figure 4: Energy consumed by types of lights in the premise based on the usage study

The analysis of the types of Lights in premises shows **LED lights consume 56.56%; whereas the CFL lights consume 34.85%; the Halogen lights consume 7.26%; the Mercury lights consume 0.70% and the Non-LED lights consume 0.63%**

4.6.3 Requirement of NAAC

4.6.3.1   Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources – There are solar panels available in the premises. The College utilizes *69% of the power generated by on grid solar system and 31% of the energy* is being given back to the grid.

4.6.3.2   Percentage of lighting power requirement met through LED bulbs

The premise has LED Lights contribute to 47% in terms of number and **57% of the power requirement** is met through the same. As per our study we could conclude that both of these numbers should improve.

4.6.4 Building-wise consumption analysis

The energy consumption of Lights is **46,315 kWh** of energy; the following graph shows the Building wise consumption.
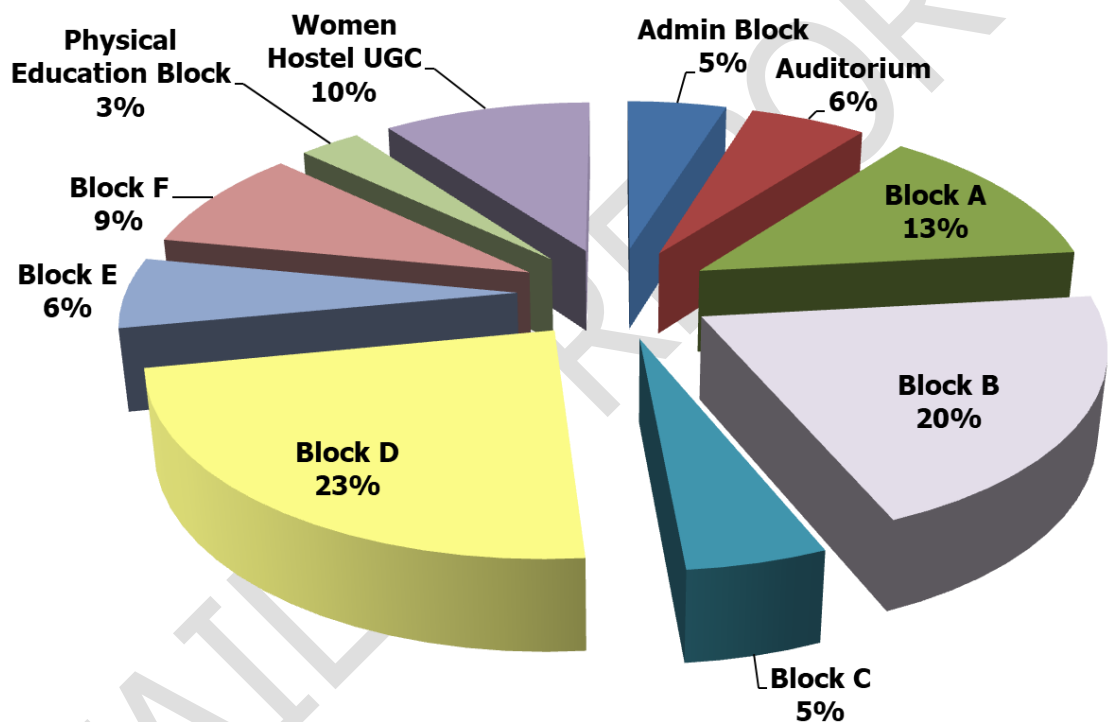

Figure 5: Energy consumed by lights Building wise

The above analysis shows the lights in the **Block D consumes 23%; the Block B consumes 20%; the Block A consumes 13%; the Women Hostel UGC block consumes 10%; the Block F consumes 9%; the Auditorium and Block E consumes 6%; the Admin block and the Block C consumes 5% and the Physical Education Block consumes 3%** of the total power consumed by lights.

4.6.5 Site investigation observations

1. All lights are in working conditions

2. Daily monitoring and check is done by the maintenance staff.

3. There was no fuse defect observed.

4.7 Fans

4.7.1 Types of fans based on the numbers

There are a total of **915 fans** in the premises. The following table shows the various types of fans in the premises.

S. No.	Type	Nos.
1	Ceiling fan	816
2	Exhaust fan	53
3	Pedestal fan	2
4	Table fan	5
5	Wall mounted fan	39

Table 7: Summary of the types of fans in premise

4.7.2 Types of fans based on the power consumption

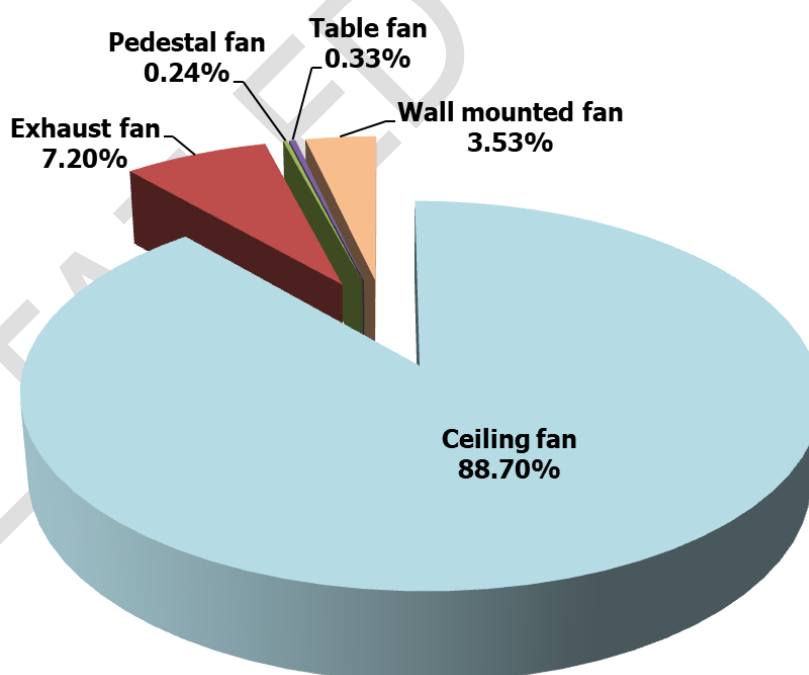The following graph shows the type of fans.

Figure 6: Energy consumed by types of fans in the premise based on the usage study

The analysis of the types of fans in premises shows **Ceiling fans consume 88.70%;** whereas the **Exhaust fans consume 7.20%;** while the **Wall mounted fans consume 3.53%;** the **Table fans consume 0.33%** and the **Pedestal fans consume 0.24%** of the total power consumed by fans.

4.7.3 Building -wise consumption analysis

The energy consumption of fans is **75,341 kWh** of energy; the following graph shows the Building wise consumption.

Figure 7: Energy consumed by fans Building wise

The above analysis shows the fans in the **Block F consume 23%; the Block D consume 21%; the Block B consumes 19%; Block C and E consume 8%; the Women hostel UGC Block consumes 7%; the Block A consumes 6%; the Admin block consumes 3% and the Physical Education Block consumes 2%** of the total power consumed by fans

4.7.4 Site investigation observations

1. All fans are in working conditions

2. Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.

4.8 Air conditioners

4.8.1 Types of air conditioners based on the numbers

There are **63 air conditioners** on the entire premises**.**

4.8.2 Building-wise consumption analysis

The energy consumption of air conditioners is **1,58,839 kWh** of energy; the following graph shows the Building wise consumption.
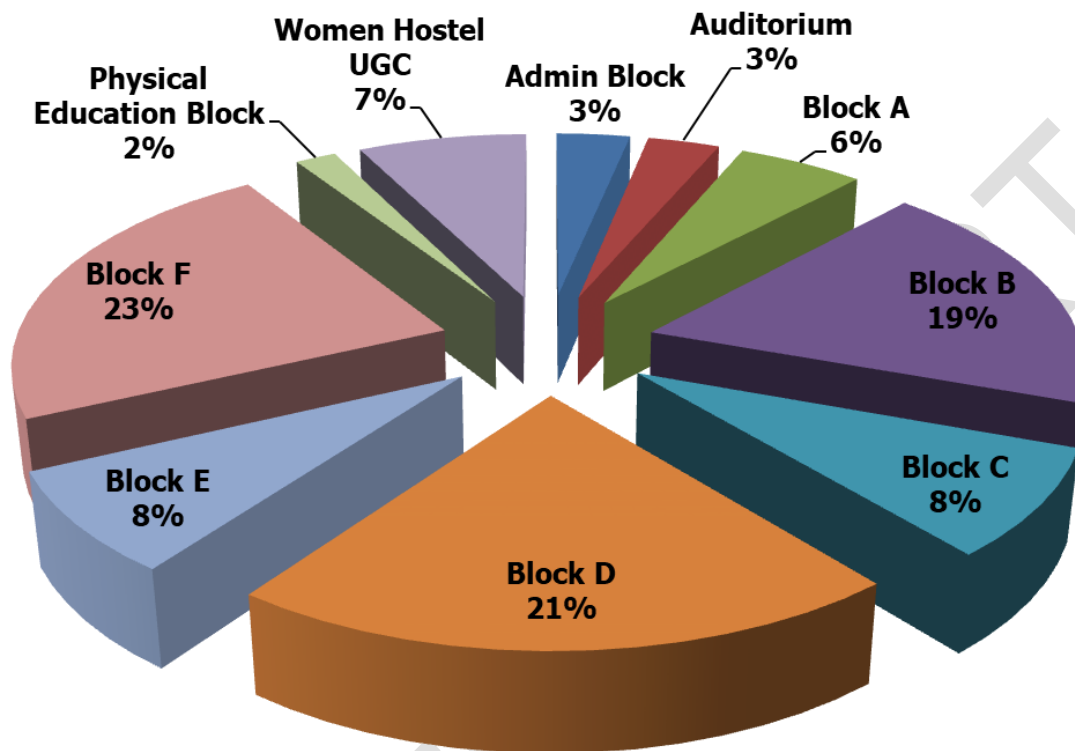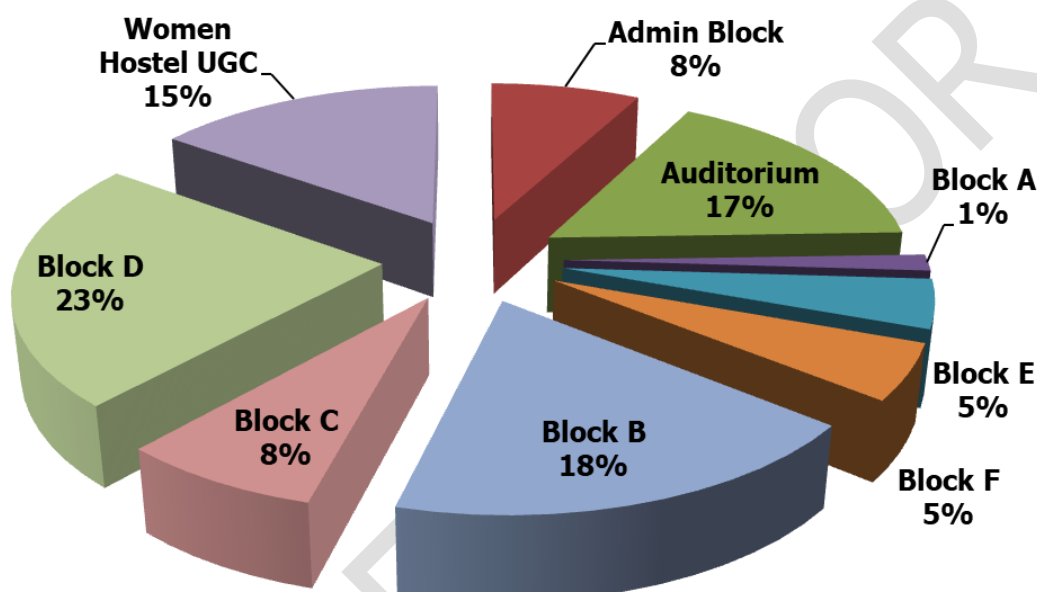

Figure 8: Energy consumed by fans Building wise

The above analysis shows the air conditioners in the **Block D consume 23%; Block B consumes 18%; Auditorium consumes 17%; Women Hostel UGC consumes 15%; Block C and Admin block consumes 8%; Block E and F consumes 5% whereas Block A consumes 1%** of the total power consumed by air conditioners.

4.8.3 Site investigation observations

1. Daily monitoring and check are done by the maintenance staff skilfully.
2. The Outdoor units were properly cleaned, maintained and had no dust collection problems.

4.8.4 About the replacement of current air conditioners

The current air conditioners are well maintained, though there is not an immediate requirement for replacement however, whenever the College undergoes redevelopment there can be provisions for replacement with energy-efficient appliances or new air conditioners that require less power consumption.

4.8 Equipment

4.8.1 Types of Equipment

There are **56 types of equipment totalling to 1,063** in the premises as follows:

S. No.	Name	Nos.
1	Adder	2
2	Air cooler	3
3	Amplifier	2
4	Autoclave	2
5	Biometric	2
6	Blower	1
7	Calorimeter	2
8	Cash counting machine	1
9	Coffee Machine	1
10	Centrifuge	3
11	Desktop Computer	142
12	Digital Board	2
13	Distillation Plant	1
14	DVR	4
15	Electric watch	1
16	Fax machine	1
17	Fresnel Diffraction	1
18	Geyser	12
19	Heat Convector	2
20	Hot Plate	1
21	Incubator	1
22	Scanner	1
23	Digital Board	1
24	Iron Press	1
25	Laptop	5
26	Lawn Motor (Electric Grass Cutting Machine)	4

27	Magnetic Stirrer with Hot Plate	1
28	Melting Point Apparatus	4
29	Microscope Projector	1
30	MOSFET	1
31	Music System	1
32	Electric Kettle	2
33	Electronic Balance	5
34	Induction	8
35	Mic	22
36	Oven	6
37	Overhead Projector	10
38	Photo Copy Machine	4
39	Printer	31
40	R.O. plant	9
41	Refrigerator	7
42	Room Heater	21
43	Set top Box	2
44	Sound Sytem	8
45	Speaker	320
46	Spectro Photometer	1
47	Submersible Pump	5
48	Television	9
49	TRIAC	1
50	Vaccum Pump	1
51	Water Bath	1
52	Water Cooler	3
53	Water Purifier	1
54	Wifi-Router	13
55	Zener diode	3
56	CCTV	363

Table 8: Types of equipment in the premise as per the quantity

4.7.2 Types of equipment based on the power consumption

The energy consumption of equipment is **1,60,053 kWh** of energy; the following graph shows the detailed consumption.

Figure 9: Summary of Energy consumed by equipment in the premises

The above summary shows that **speaker consumes more energy at 54.61%** while **refrigerator consumes 13.10%** and the **desktop computer consumes 8.45%** these are maximum consumers as compared to other equipment.

Batteries and Inverter (when used for electrical consumption else it is a battery backup and does not require electricity as an equipment) are also one of the equipment but are excluded in this calculation.

4.8.2 Site investigation observations

1. All equipments are in working conditions and daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.

2. No defect was found in any equipment of electrical consumption.

4.9 Recommendations for a Sustainable Habitat

Over the time energy efficient appliances have been a boon not only to the energy saving parameters they adhere to but also the eco-friendly habits it helps to inculcate. The Institution such as Schools and Colleges are the best way to implement these initiatives. It creates awareness among the students at a young age. The Institutions also act as a symbol and representative of being an energy efficient premise. Following the analysis we found are some of the suggestions which can be implemented for an energy efficient Institution. **This would help in reduction of the current electrical consumption by a major percentage.**

Section 1 Building management systems

The College has extreme potential to become 100% energy-efficient premises. In addition to provisions in the electromechanical system, some facilities can be introduced towards building management systems as well. These can be undertaken equally for educational and residential sections.

- **Set the BMS time of day schedules** - To suit the minimum occupancy periods of the areas served and implement optimum start-stop incorporating a night purge cycle, session, and holiday schedule.

- **Space temperature Setback -** A temperature setback is a simple strategy to help save utility costs by reducing how often your heating or cooling system operates. *(morrisseyengineering)*

- **Timer control of air conditioners.**

- **Timer control of personal heaters -** Install push button timer control of personal heaters in Residential areas.

Section 2 – Electromechanical systems – Electrical and Lighting

Sub-Section 1 – Lights

Non-LED lights

The current light analysis shows that there are lights such as Non-LED lights, CFL, Halogen, Mercury lights in the premises. Our technical analysis shows that there would be a reduction of an average of **50% reduction** in energy consumption through lights

specifically as a part of the electro -mechanical system if all **Non-LED lights, CFL, Halogen, Mercury lights on all floors** are replaced with an energy efficient appliance whenever the College undergoes renovation.

Sub-Section 2 - Fans

Ceiling fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 45W when in use. These should be replaced with energy efficient fans consuming 14W when in use. Our detailed study states that is all the **ceiling fans on all floors** if replaced with star rated appliance results in a reduction of average of **69% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if college can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

Sub-Section 3 - Equipment

Desktop computers to laptops

Among all equipment it suggested to replace the desktop computers with laptops as this would be energy efficient. A normal desktop computer consumes on an average 250W and it is to be connected all time when it has to be used. On the contrary a laptop consumes 40W and has a battery backup which lasts up to 4 hours.   There is **an average 84% reduction** in energy consumption if replaced with energy efficient appliance which is a laptop in all the areas of Educational areas.

This replacement is however is dependent on a variety of factors as follows.

- Some of the senior staff members may be more convenient with computers, replacement with laptop might result in a change of the working patterns and hours which may affect the productivity.

- Laptops – in case are not handled with care such as if dropped unintentionally might result in data imbalance.

- Students who are not day scholars can use laptop as per their own convenience, whereas in common areas there can a monitoring about the usage

hours hence computers may be a preferable option then laptop in certain spaces.

- Similarly depending on the pandemic situation in case it might be possible due to irregular usage the device might have issues while functioning.

Thus the College should analyse the above points and then devise a strategy about the replacement, essentially when the devices get damaged or are not in working condition they can surely be replaced.

As well as once they are not in working condition the proposed strategy should be linked towards e-waste management as well.

Section 4 – Solarisation

Zero energy and Net positive energy buildings

Zero energy buildings combine energy efficiency and renewable energy generation to consume only as much energy as can be produced onsite through renewable resources over a specified period.

(Source: https://www.energy.gov/eere/buildings/zero-energy-buildings)

The term "net-zero" energy (or NZE) describes the concept of buildings generating their own energy needs by renewable on-site power generation.

(Source: https://www.dsaarch.com/zero-net-positive-energy)

The premises at present have an excellent system in place w.r.t. to renewable energy. However, over time efforts can be undertaken towards 100% power capacity being met by the systems on the premises and the additional power systems being given back to the grid.

This will be an excellent achievement to be one of the first educational premises in the country to achieve this milestone. A careful plan of action will have to be determined with Architectural and Renewable energy experts which will help to achieve this goal over some time.

Shahjahanpur, Uttar Pradesh, India
Longitude 79.8919° E Latitude 27.8551° N
41° C
Monday, 25, Apr, 2022 11:49 AM

Shahjahanpur, Uttar Pradesh, India
Longitude 79.8919° E Latitude 27.8552° N
41° C
Monday, 25, Apr, 2022 11:59 AM

Greenvio
Solutions

5. Towards a Healthy & Sustainable Institution

5.1 Inputs by Greenvio Solutions

Based on the analysis of the study of premises in addition to the recommendations provided in each section of Ecological, Water, Waste, and Energy Audit the University can adopt the following strategies for a Healthy and Sustainable Institution practices.

a) **Cutlery in the Canteen –** The regular plastic and steel plates, and spoons used in Canteen can be replaced with eco-friendly and organic leaves, paper straws, disposable plates, edible spoons, and tables made out of sugarcane waste or bamboo. This will be the first of its kind initiative to be adopted and practiced thus also inculcating healthy practices in students.

b) **Environment Certificate Courses –** The College could begin courses such as Bachelor's, Diploma, or Certificate courses with National and International Collaboration related to Environment as part of the courses provided. Though, this is not a requirement or compulsion.

c) **Terrace farming -** There can be the provision of terrace farming in a designated area of the open space this would enhance the biodiversity and be useful in training students and staff about the healthy practices and food grown which would be used in Canteen. It helps in smaller steps are taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, and terrace garden there will be a long term benefit for the environment as a whole.

d) **Signages –** In addition to the signages being in regular language there can be additional signages in braille language for the specially-abled students.

5.2   Survey Results

An online survey was conducted to analyse the student and staff views about what changes according to you can be undertaken for Green audit improvement in College premise and activity. **Some of the suggestions are listed below:**

- Awareness program for stopping the single use plastic and stopping the misuse of water and energy among students and society should be run regularly.

- According to me, the best improvement is to try to preserve the greenery that is available.

- Plant more carbon dioxide absorbing plants like Pine, Neem, Peepal, Bamboo, Banyan which will help in Carbon Neutralising.

- Ozone conservation and more activities

- Shady tree cover should be increased and flowering plants should be used at appropriate places.

- A special team for sustainable development.

- There can be join the student to other government green programme.

However, it should be noted that the College has taken up multiple initiatives and because of Pandemic the students have not practically visited the premises so many of these points are not mandatory at the moment.

6. References

1. Uniform Plumbing Code – India, 2008

2. IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013

3. IGBC Green Landscape Rating system, March 2013

4. BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada

5. Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorizes vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.

6. Specific references for study related to energy

    ⇒ https://www.energy.gov/eere/buildings/zero-energy-buildings

    ⇒ https://www.dsaarch.com/zero-net-positive-energy

    ⇒ U.S. Energy Information Administration