



**GREEN AUDIT REPORT
FOR
HSBPVT GOI FACULTY OF
ENGINEERING**



Elion Technologies & Consulting Private Limited

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Acknowledgment

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to HSBPVT GOI Faculty of Engineering for entrusting the task of conducting green audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.



Site Information

Name of College	HSBPVT GOI Faculty of Engineering
College Address	A/P Kashti, Tal. Shrigonda, Dist. Ahmednagar, Maharashtra, 414701
Execution Partner	ELION Technologies & Consulting Pvt Ltd
Communication Address	307, 3rd Floor DDA Lal Market H-Block VikasPuri, New Delhi-110018
Date of Audit	31 st March 2022
Year of Audit	2021 – 2022
Audit Participants	Dr. V.N. Patil (Principal) Prof. Shivaji Udamale (I/C HOD Electrical Engineering Department) Prof. Abhishek Pachpute (Asst. Professor Civil Engineering Department)
Total Covered Area of the College	22.5 Acres
Total Green Area	10 Acres



Overview of Campus

Parikrama Group of Institutions is a brain child of Hon. Shri Babanrao Pachpute, whose foresight and entrepreneurial abilities have created one of the largest integrated campus in the country. Parikrama is the only of its kind "Village for global welfare" that spreads over 110 acres of lush green country side of Maharashtra with urban outlook and facilities. Parikrama started its educational activities in 2009 with a range of educational courses from KG to PG. Today, the Society has over hundreds of students on the roll of Public School, Parikrama Polytechnic, Parikrama Diploma in Pharmaceutical Sciences ,College of Pharmacy, College of Engineering, Institute of Management. Hon. Shri. Babanrao Pachpute Vichardhara Trust's Faculty of Engineering approved by A.I.C.T.E. has been started in the year 2009. All efforts are made to ensure that useful industry-academia interface is maintained on an on-going process so that the employability of our diploma holders is enhanced. The overall growth and development of the personality of the students is taken care of by organizing various cultural and sports activities in the campus. The sincere and complete involvement of Management and staff members can be seen in the results achieved by the students in academics as well as various extra-curricular activities.

Vision

To provide a dynamic, purposeful and holistic education experience to students which will help create opportunities for them to become able technocrats, pharmacists and management professionals responsive to the socio-economic upliftment of rural India.

Mission

To serve the needs of the industry, society in general and rural areas in particular by imparting attitude, knowledge and skills with quality education and creating self-disciplined, mentally robust and morally strong professionals.

List of courses offered by the college:

- B.E (Computer Engineering)
- B.E (Civil Engineering)
- B.E (Electrical Engineering)
- B.E (Electronics & Telecommunication Engineering)
- B.E (Mechanical Engineering)



Introduction

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students' better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

Advantages of Green Audit:

Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Some main advantages of green Audit are:

- It helps to shield the environment.
- Minimizing the waste and managing the cost.
- Authenticate conformity with the implemented laws.
- Minimizing the energy consumptions and focus on green and clean energy.
- Ambient Environmental Condition.
- Awareness and Training on Sustainability for Students.
- Awareness about environmental guidelines and duties.



Environment Setting

The land use around the campus is mainly comprised of agricultural and green land with other institutes and shops in the near vicinity.



HSBPVT GOI Faculty of Engineering Campus

HSBPVT GOI FACULTY OF ENGINEERING

Shrigonda, Ahmednagar, Maharashtra

Green Audit Report No: GA31032022



Location of HSBPVT GOI Faculty of Engineering Campus



Green Audit

For Green Audit following 13 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

- a) Good Daylight Design and Ventilation
- b) Water Efficiency
- c) Wastewater Management
- d) Indoor Air Quality
- e) Energy Efficiency
- f) On-site Energy Generation
- g) Temperature and Acoustic Control
- h) Paper Waste Management
- i) E-Waste Management
- j) Canteen and Solid Waste Management
- k) Universal Access and Efficient Operation and Maintenance of Building
- l) Green Belt
- m) Green Programs (Green initiatives)

3.1 Good Daylight Design and Ventilation

- a) Corridors are wide with good ceiling height. All the corridors receive good daylight.
- b) Classrooms, Labs and Library have large windows. Adequate daylight is received through the windows during daytime.
- c) Classroom walls, corridors and labs are white-washed, this enhances the daylight received.
- d) Curtains are provided on some of the windows to avoid glare.
- e) Laboratories and washrooms are provided with exhaust fans to disperse heat, fumes and odors.
- f) Stair cases receive daylight through windows provided at various levels.



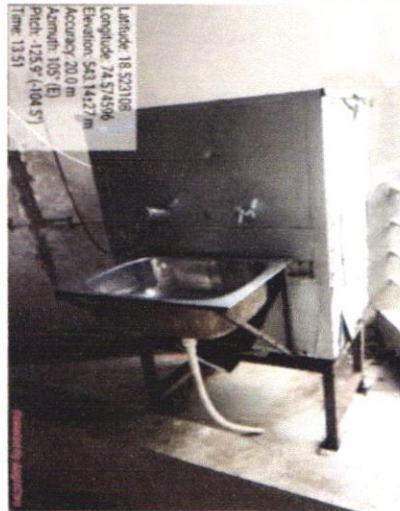
Daylight in classrooms



Broad daylight in staircases

3.2 Water Efficiency:

- a) Ground water is the main source for water supply in the campus.
- b) Ground water is stored in an overhead tank of capacity 10000 litres.
- c) For drinking water, Centralized RO water filter is available. There are 2 coolers available one is installed near to TPO office ground floor another one is installed at second floor.
- d) Normally mops are used for floor cleaning and hose is used for cleaning once a week
- e) Dual flushing system is provided in the washrooms.
- f) Signages are provided in washrooms emphasizing water conservation.
- g) Water from air conditioning unit and reject water from RO plant is used in gardening.
- h) Rain water harvesting system is available in the college.



Water Cooler



Water Tank

3.3 Wastewater Management:

- i) Sewage treatment plant is not available in the campus.

3.4 Indoor Air Quality;

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutant are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.



- Volatile organic compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Major observations under indoor air quality are as below:

- a) In classrooms the mode of ventilation is natural (through windows) and is enhanced by fans. Air conditioners are used in some of the rooms.
- b) Heating Ventilation and Air Conditioning (HVAC) system does not exist. Split and Window Air Conditioners are used in the campus.
- c) Indoor plants are seen in the College. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer Annexure 1 for details.
- d) Exhaust fans are provided in the washrooms and labs.
- e) Green belts have been set up in campus area.



Indoor Plants

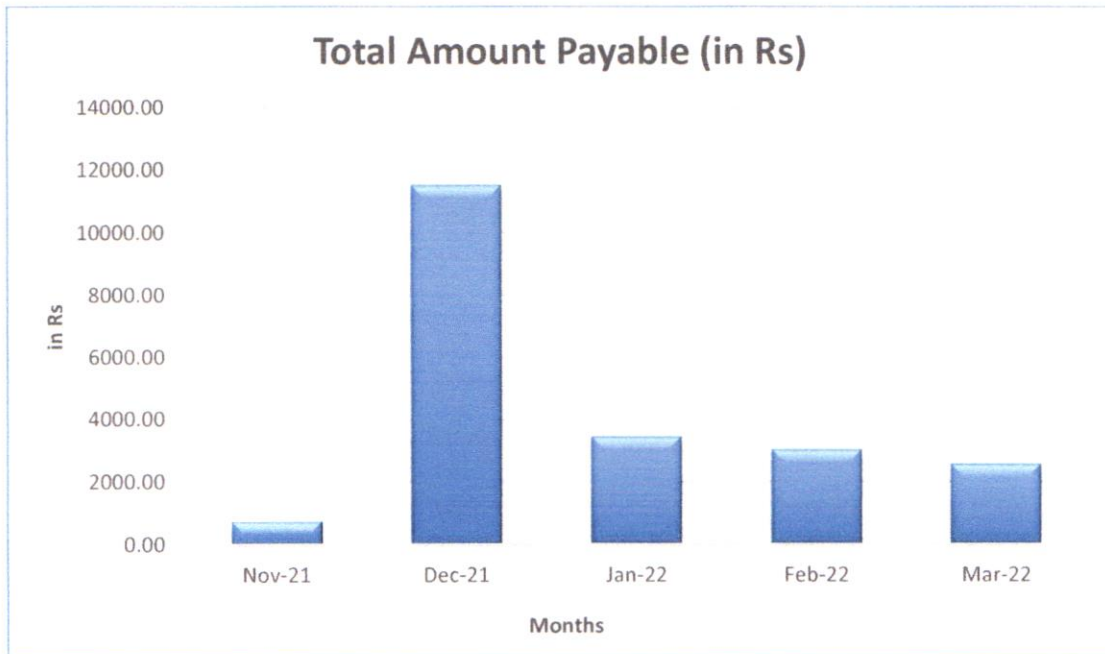
3.5 Energy Efficiency:

Electricity:

Power is supplied by Maharashtra State Electricity Distribution Company Limited. The major electricity consuming equipments installed in the campus are Split and Window ACs, Water Coolers, Desktops, Pumps, Motors, Lights, Printers, Fans, etc.



Following is details of energy consumption:



It was observed that:

- a) Campus has air conditioners which are in good working condition.
- b) LED lights are installed in the entire campus.
- c) Solar Plant of is also installed in the campus.



Solar Plant



3.6 On Site Energy Generation (usage of LPG/ Natural Gas):

- a) LPG is provided in the canteen for cooking.
- b) Back Up diesel generator is available in the campus.

3.7 Temperature and Acoustic Control

- a) White washed rooms & corridors and white/off-white flooring improve the lighting conditions.
- b) The entire campus has green area.
- c) The campus has done tree plantation around college which helps in reducing temperature.
- d) There is no noise pollution around the campus.



Green Campus

3.8 Paper Waste Management:

Being academic institution, waste paper is the main solid waste generated in the premises. The College has taken steps to minimize and avoid paper usage.

It was observed that:

- a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalization (scanning) is practiced.
- b) Internal notices and communications are through E-mail/Whatsapp.
- c) Faculty and administration staff uses old papers and envelopes for internal usages as rough work, file markers, page separators etc.
- d) Old question papers, answer sheets and other papers are stored in strong room.



Storage of paper

3.9 E-Waste Management:

- a) A policy of disposal of E-waste is present in the campus.

3.10 Solid Waste Management:

It was observed that:

- a) Wet waste and dry waste segregation is practiced in the premises. Separate bins are provided for wet biodegradable and dry recyclable waste.
- b) Waste produced in the campus is decomposed in the compost pits.

3.11 Universal Access and Efficient Operation and Maintenance of Building:

It was observed that:

- a) College is easily accessible. Staircase and ramps are provided for staff and students.
- b) Since the access and staircases are wide and uncluttered, it is possible to have a safe evacuation during emergency.
- c) Firefighting installations are provided for emergency.
- d) Directional exit signages and floor markings are present on every floor of the campus.
- e) Fire Safety training is provided to the staff of the campus on regular basis.

3.12 Green belt/ Landscaping:

- a) Large trees and plants are planted in the premises. Plantation also helps maintaining lower temperatures of the area.



Green Campus

3.13 Green Initiatives:

College is regularly celebrating cultural programs along with Environment Day, Yoga Day, Earth Day etc.



Recommendations/Suggestions

For Improving Energy Consumption:

- a) Every classroom and lab with central switch board can have a diagram linking location of a tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
- b) Installation of automatic lights with sensors can be considered.
- c) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, using eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier to be preferred.
- d) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
- e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
- f) If possible, computers should be switched off from main power connections.
- g) Notices/signages can be put up/displayed near switches and on notice boards, informing students and staff to switch off all electricals when not in use.
- h) Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
- i) Raise awareness:
 - Encourage students to help in monitoring energy consumption & implement corrective actions
 - Integrate energy education into classroom learning.

Water Conservation:

- a) Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
- b) Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
- c) Minimize/ reduce water usage by installing water saving faucets such as pressmatic taps, tap aerators, jet sprays etc.
- d) Installation of waterless urinals can be considered to reduce water consumption.
- e) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.



Paper and other Solid Waste Reduction:

- a) Inventories of all solid waste generated in the premises must be maintained.
- b) Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other material to needy students. This can be an initiative under green program.
- c) Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste should be prepared & practiced. The SOP's may include collection, segregation and reuse of different types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.
- d) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
- e) The college can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
- f) Paper usage shall be monitored to understand the impact of digitization in the facility.





Others:

- a) Environmental advisory committee could be formed. The discussions/ information sharing among different departments can generate lot of ideas and awareness on green issues.
- b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.
- c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
- d) Consider detailed energy audit (energy consumption, thermal emission, visual comfort) and water audit.
- e) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.







Annexure 1 – Indoor Gardening Details





Indoor plants are commonly used for their aesthetics benefits but they also have vital role reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractor can be contacted for supply and rotation of these plants.

Plants	VOC it removes	Indoor source of VOC's	Plant care
 <p>Aloe Vera</p>	Formaldehyde, Trichloroethylene and Benzene	Chemical based cleaners and paints	Easy to grow with enough sunlight
 <p>Bamboo Plant</p>	Formaldehyde, Trichloroethylene and Benzene	Paints, Plastics, Wood products etc.	Thrives under low light conditions as well as easy to maintain
 <p>Chinese Evergreen</p>	Benzene	Paints	Low maintenance plant that prefers low light conditions.
 <p>English Ivy</p>	Formaldehyde, Benzene, Air borne fecal matter particles	Wood, Paper products, Air borne fecal – matter particles from pests	Easy to maintain



	<p>Formaldehyde, Benzene and Trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Medium to low light tolerant plant. Requires little water for growth.</p>
	<p>Formaldehyde, Cleanses air</p>	<p>Exhaust fumes, carpeting materials, panelling and furniture products made with particle board</p>	<p>Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.</p>
	<p>Formaldehyde, benzene and trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Medium to low light tolerant plant. Requires little water for growth.</p>
	<p>Formaldehyde and trichloroethylene</p>	<p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p>	<p>Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.</p>



 <p>Peace Lily</p>	<p>Formaldehyde, benzene and trichloroethylene</p>	<p>Paints, Plastics, Wood products etc.</p>	<p>Relatively easy to maintain. Survives in low light conditions.</p>
 <p>Red-edged Dracaena</p>	<p>Formaldehyde and trichloroethylene</p>	<p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p>	<p>Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.</p>
 <p>Spider Plant</p>	<p>Formaldehyde, benzene, carbon monoxide and xylene</p>	<p>cooking fuels, wood products, Printing</p>	<p>Easy to maintain under medium to bright light condition.</p>
 <p>Parlor Palm</p>	<p>Purifies indoor air</p>	<p>-</p>	<p>Easy to maintain</p>

HSBPVT GOI FACULTY OF ENGINEERING

Shrigonda, Ahmednagar, Maharashtra

Green Audit Report No: GA31032022



Registered Office:

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DISCLAIMER

All information contained in this report is based on the data available and observations made during the audit. All recommendations made in this audit report should be duly evaluated by the management before implementation.

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Acknowledgement

Elion Technologies and Consulting Pvt Ltd thanks the management of HSBPVT GOI Faculty of Engineering for assigning this important work of Environmental Audit. We appreciate the co-operation to our team for completion of study.

For giving us necessary inputs to carry out this very vital exercise of Environment Audit. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.



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Concept

The term 'Environmental audit' means differently to different people. Terms like 'assessment', 'survey' and 'review' are also used to describe similar activities. Furthermore, some organizations believe that an 'environmental audit' addresses only environmental matters, whereas others use the term to mean an audit of health, safety and environment-related matters. Although there is no universal definition of Environmental Audit, many leading companies/ institutions follow the basic philosophy and approach summarized by the broad definition adopted by the International Chambers of Commerce (ICC) in its publication of Environmental Auditing (1989).

The ICC defines Environmental Auditing as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of safeguarding the environment and natural resources in its operations/projects."

The European Commission, in its proposed regulation on environmental auditing, has also adopted the ICC definition of Environmental Audit.



Introduction

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues.

Environmental Management Systems (EMS) is very popular in the industrial sector, but the general belief is that EMS is something pertaining to industries only. Other parts of the world have started adopting compatible environmental management systems either voluntarily or for promoting standards by external certification. International environmental standards do not suit the existing Indian educational system.

A very simple indigenized system has been devised to monitor the environmental performance of educational institutions. It comes with a series of questions to be answered on a regular basis. Environmental conditions may be monitored from angles that are relevant to Indian requirements, without stress on legal issues or compliance. This innovative scheme is user- friendly and totally voluntary. The environmental monitoring system helps the institution to set environmental examples for the community and to educate young learners. It can be adapted to urban and / or rural situations.



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Audit Objectives

The broad aims/ benefits of the eco-auditing system would be –

- Environmental education through systematic environmental management approach
- Improving environmental standards
- Benchmarking for environmental protection initiatives
- Reduction in resource use
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership, personal and social responsibility for the college campus and its environment
- Enhancement of university profile
- Developing an environmental ethic and value systems in young people



Executive Summary

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance.

This is second environmental audit of campus for NACC affiliation; QS Program and doing their bid towards environmental protection and environmental awareness at local and global front. Audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation and environmental legislative compliance by the campus. A questionnaire is used during audit. This audit report contains observations and recommendations for improvement of environmental consciousness.



Environmental Audit - Questionnaire

The areas of eco/environmental/green auditing to be followed/practiced by participating institutions:

- I. Waste Minimization and Recycling
- II. Greening
- III. Energy Conservation
- IV. Water Conservation
- V. Clean Air
- VI. Animal Welfare
- VII. Environmental Legislative
- VIII. General Practices

Is any Environmental Audit conducted earlier?

No.

What is the total permanent population of the Campus?

	Male	Female	Total
Students	756	284	1040
Teachers	37	24	61
Non-Teaching Staff	16	1	14
Sub Total	809	309	1115
Approximate Number of Visitors (Per day)			90
What is the total number of working days of your campus in a year?			264

Where is the campus located?

The campus is Located in Kashti, Maharashtra.



Which of the following are available in your campus?

1	Garden area	Yes
2	Playground	Yes
3	Kitchen	No
4	Toilets	Yes
5	Garbage Or Waste Store Yard	Yes
6	Laboratory	Yes
7	Canteen	Yes
8	Hostel Facility (Numbers)	Yes
9	Guest House	Yes

Which of the following are found near your campus?

1	Municipal dump yard	Yes
2	Garbage heap	Yes
3	Public convenience	Yes
4	Sewer line	Yes
5	Stagnant water	Yes
6	Open drainage	No
7	Industry – (Mention the type)	No
8	Bus / Railway station	Yes
9	Market / Shopping complex / Public halls	Yes



I - WASTE MINIMIZATION AND RECYCLING

- | | | |
|----|---|--|
| 1. | Does your campus generate any waste?
If so, what are they? | Yes.
Paper waste and food waste. |
| 2. | What is the approximate amount of waste generated per day? (in Kilograms/month) (approx.) | 100Kg/month. |
| 3. | How is the waste generated in the campus managed? By
1 Composting
2 Recycling
3 Reusing
4 Others(specify) | Composting |
| 4. | Do you use recycled paper in campus? | Yes |
| 5. | Do you use reused paper in campus? | Yes |
| 6. | How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify. | Yes by arranging campus drive or NSS activity. |
| 7. | Can you achieve zero garbage in your campus? If yes, how? | Yes, by regular disposal. |

**II – GREENING THE CAMPUS**

1.	Is there a garden in your campus?	Yes
2.	Do students spend time in the garden?	Yes
3.	Total number of Plants in Campus	More than 500.
4.	Provide some names of trees and plants in the campus.	Neem, Coconut tree, Palm tree, Mango tree, Rain Tree, Tamarind Tree etc.
5.	Is the university campus having any Horticulture Department?	No
	If yes, number of Staff working in Horticulture Department?	NA
6.	Number of Tree Plantation Drives organized by institute per annum.(If Any)	2 per annum.
7.	Number of Trees Planted in Last year.	60
	Survival Rate	70-80%
8.	Plant Distribution Program for Students and Community	Yes
9.	Plant Ownership Program	Yes



III – ENERGY

1. List down ways that you use energy in your campus. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.	1. Electricity supply from Distribution Company.
2. Are there any energy saving methods, equipments, techniques employed in your campus? If yes, please specify. If no, suggest some	Use of LED Lights.
3. Give an estimate of number of lights installed in your campus along with numbers?	193
4. Are any alternative energy sources employed/ installed in your campus? (photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.) Specify.	Solar Energy.
5. Do you run "switch off" drills at campus?	Yes
6. Are your computers and other equipment's put-on power-saving mode?	Yes
7. Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?	Yes, 1-2 hours.



IV - WATER CONSERVATION

<p>1. List all the uses of water in your campus?</p>	<ul style="list-style-type: none"> • Lab purpose • Drinking purpose • Irrigation purpose
<p>2. How does your campus store water? (mention tanks with capacity) Are there any water saving techniques followed in your campus?</p>	<p>1. Tank of capacity 10000L.</p>
<p>3. If there is water wastage, specify why and how can the wastage be prevented/ stopped?</p>	<p>No wastage as such.</p>
<p>4. Locate the point of entry of water and point of exit of waste water in your campus. Entry- Exit-</p>	<p>Entry - Tank Exit - Drainage Tank</p>
<p>5. Write down few ways that could reduce the amount of water used in your campus?</p>	<ul style="list-style-type: none"> • Avoid flushing the toilet unnecessarily. • Make sure to use collected rainwater for gardening washing purpose.
<p>6. Record water use from the campus water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many litres of water have been used.</p>	<p>No water meter installed.</p>
<p>7. Does your campus harvest rain water? (Please explain the method and uses)</p>	<p>Yes. rainwater from the terrace is collected by pipeline and is stored in</p>



	bore.				
8. Is there any water recycling System.	No				
V - CLEAN AIR					
1. Are the Rooms in Campus are Well Ventilated?	Yes				
2. Number of windows per room (aggregate value to be provided)	4 per room.				
3. What is the ownership of the vehicles used by your institute? (Please Tick ✓only one)	Yes				
	Operator-owned vehicles				
	✓ Institute-owned vehicles				
	A combination of campus-owned and operator-owned vehicles				
4. Provide details of institute-owned motorized vehicles?	Buses	Cars	Vans	Other	Total
No. of vehicles	21	2	-	-	23
No. of vehicles more than five years old	21	-	-	-	21
No. of Air conditioned vehicles	-	-	-	-	-
PUC done	Yes	Yes	-	-	23
5. Specify the type of fuel used by your institute's vehicles:	Buses	Cars	Vans	Other	
Diesel	✓	✓	-	-	
Petrol	-	-	-	-	
CNG	-	-	-	-	
LPG	-	-	-	-	
Electric	-	-	-	-	
6. Air Quality Monitoring Program (If Any)	No				



7. Students suffer from respiratory ailments? (IfAny)	No
8. Details of Diesel/Gas Generator. (Rating & Make)	125KVA Kirloskar make.

VI – ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.) (if any)	Horses, Dogs, Cats, Squirrels, Birds, Insects, Peacock etc.
2. How many dogs in your area have undergone Animal Birth Control - Anti Rabies (ABC - AR)?	12
3. Does your campus have a Biodiversity Programme or a KARUNA CLUB?	No

VII - ENVIRONMENTAL LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2. Does your campus have any rules to protect the environment? List possible rules you could include.	Yes, say no to plastic.
3. Dose Environmental Ambient Air Quality Monitoring conducted by the Campus?	No
4. Dose Environmental Water and Wastewater Quality monitoring conducted by the Campus?	No



5.	Dose stack monitoring of DG sets conducted by the Campus?	No
6.	Is any warning notice, letter issued by state government bodies?	No
7.	Dose any Hazardous waste generated by the Campus? If yes explain its category and disposal method.	No
8.	Dose any Bio medical waste generated by the Campus? If yes explain its category and disposal method.	No

VIII - GENERAL

1.	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2.	Does your campus have any rules to protect the environment? List possible rules you could include.	Yes
3.	What is the housekeeping schedule of garden and common areas in your campus?	Daily cleaning by gardener and cleaner.
4.	Are students and faculties aware of environmental cleanliness ways? If Yes Explain	Yes our collage arranges cleaning drive under NSS activity.
5.	Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. celebrated in your Campus?	Yes
6.	Does Campus participated in National and Local Environmental Protection Movement?	Yes
7.	Does Campus have any Recognition/certification for environment friendliness?	Yes
8.	Is Campus using renewable energy?	Yes, solar energy.



- | | |
|--|-----------------------------|
| 9. Does Institution conducts a green/environmental audit of its campus? | No, this is the first time. |
| 10. Has the institution been audited/ accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.? | No |



Recommendations

- Environment Policy to be adopted by the Campus.
- Water Meter should be installed at the bore well and daily consumption of water shall be recorded to keep a check on water usage.
- Equipments when not in use shall be switched off and should not run in standby modes or ideal.
- Testing for indoor air quality and drinking water should be carried out on a regular basis.



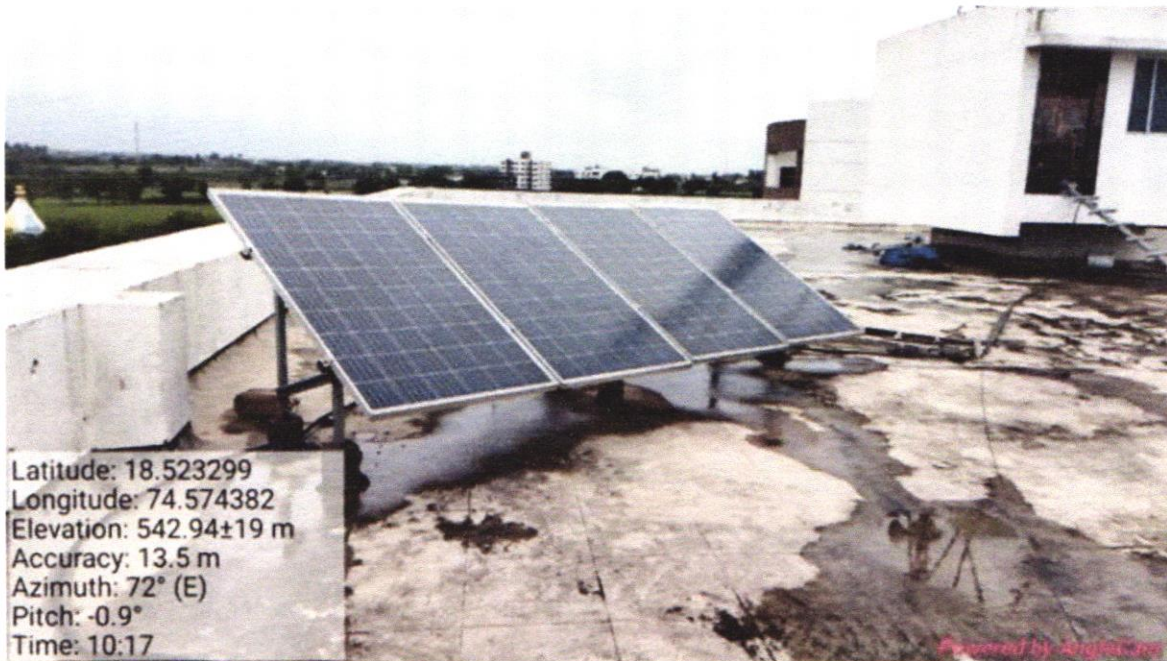
Photographic Evidences



Tree Plantation



Green Campus



Solar Plant



Water Tank



Conclusion

This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. Overall, large amount of campus is for landscaping. The audit has identified several observations for making the campus premise more environmentally friendly. The recommendations are also mentioned with observations for university campus team to initiate actions.

The audit team opines that the overall site is maintained well from environmental perspective. There are no major observations but recommendation is made in this report which would further strengthen the goal to achieve 100% environment friendly campus.



References

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle Rules:1989 (Amended in 2005)
- Energy Conservation Act 2010.
- The Water [Prevention & Control of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Water [Prevention & Control of Pollution] Cess Act-1977 (Amended 2003) and Rules- 1978
- The Air [Prevention & Control of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981)
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices

End of Report



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**ENERGY AUDIT REPORT
FOR
HSBPVT GOI FACULTY OF
ENGINEERING**



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Acknowledgement

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to HSBPVT GOI Faculty of Engineering for entrusting the task of conducting energy audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.



Site Information

Name of College	HSBPVT GOI Faculty of Engineering
College Address	A/P Kashti, Tal. Shrigonda, Dist. Ahmednagar, Maharashtra, 414701
Execution Partner	ELION Technologies & Consulting Pvt Ltd
Communication Address	307, 3rd Floor DDA Lal Market H-Block Vikas Puri, New Delhi – 110018
Date of Audit	31 st March 2022
Year of Audit	2021 – 2022
Site Team who participated in the Study	Dr. V.N. Patil (Principal) Prof. Shivaji Udamale (I/C HOD Electrical Engineering Department) Prof. Abhishek Pachpute (Asst. Professor Civil Engineering Department)
Main Energy Consuming Machines/Equipments considered for Energy Audit	<ul style="list-style-type: none">• Lighting & Fans• Air Conditioners• Motors & Pumps• Desktops & Printers



Executive Summary

Parikrama Group of Institutions is a brain child of Hon. Shri Babanrao Pachpute, whose foresight and entrepreneurial abilities have created one of the largest integrated campus in the country. Parikrama is the only of its kind "Village for global welfare" that spreads over 110 acres of lush green country side of Maharashtra with urban outlook and facilities. Parikrama started its educational activities in 2009 with a range of educational courses from KG to PG. Today, the Society has over hundreds of students on the roll of Public School, Parikrama Polytechnic, Parikrama Diploma in Pharmaceutical Sciences, College of Pharmacy, College of Engineering and Institute of Management. Hon. Shri. Babanrao Pachpute Vichardhara Trust's Faculty of Engineering approved by A.I.C.T.E. has been started in the year 2009. All efforts are made to ensure that useful industry-academia interface is maintained on an on-going process so that the employability of our diploma holders is enhanced. The overall growth and development of the personality of the students is taken care of by organizing various cultural and sports activities in the campus. The sincere and complete involvement of Management and staff members can be seen in the results achieved by the students in academics as well as various extra-curricular activities.

Vision

To provide a dynamic, purposeful and holistic education experience to students which will help create opportunities for them to become able technocrats, pharmacists and management professionals responsive to the socio-economic upliftment of rural India.

Mission

To serve the needs of the industry, society in general and rural areas in particular by imparting attitude, knowledge and skills with quality education and creating self-disciplined, mentally robust and morally strong professionals.

List of courses offered by the college:

- B.E (Computer Engineering)
- B.E (Civil Engineering)
- B.E (Electrical Engineering)
- B.E (Electronics & Telecommunication Engineering)
- B.E (Mechanical Engineering)

Electricity is supplied by Maharashtra State Electricity Distribution Company Limited and for backup power supply DG Set of 125KVA is available.

The energy audit included detailed data collection, analysis of data and identification of specific energy saving proposals.



Chapter 01: Introduction

HSBPVT GOI Faculty of Engineering evinced interest in availing the services of Elion Technologies and Consulting Pvt Ltd for conducting energy audit of their premises.

Elion Technologies and Consulting Pvt Ltd team conducted the Detail Energy audit on 31st March 2022.

This report is on the energy audit carried out HSBPVT GOI Faculty of Engineering. The detailed energy audit comprised of the following activities:

- Data collection of power consuming equipment's.
- A brief session on energy management was conducted to seek more inputs from the personnel engaged in operation and maintenance of electro mechanical services.
- Analysis of collected data.
- Discussion with the officials on the identified proposals.
- Discussion and reporting of the findings of energy audit with the management staff.

All the identified energy savings proposals have been discussed with the executives concerned before finalizing the projects.

The contents of the report are based solely on the data provided by HSBPVT GOI Faculty of Engineering officials during the energy audit.

The management should implement the suggestions made in the report after verifying requisite safety aspects.

Methodology for Energy Audit:

The following is a list of general procedure and information undertaken during the energy audit:

- General information of the site.
- Baseline energy description.
- Past energy consumption bills which includes electricity bills.



- On site data collection
- Energy analysis of different sectors.
- Recommendation of energy conservation measures.

The primary goal of the energy audit was to identify sources and areas of potential energy savings and cost saving throughout the Plant by measures of optimization, replacement, retrofitting, and on the other hand, to also provide recommendations on operational and maintenance practices improvements.



Chapter 02: Energy Consumption Details

List of equipments present in the campus:

Rating of Transformer (in KVA)	675 KVA
Year of installation of the Transformer	2009
Rating of DG Set (in KVA)	125 KVA
Rating of Capacitor Bank (if present)	NA
Capacity of Solar Power Plant (if installed)	1 KW

The main areas of energy consumption as observed during the audit are as follows:

- Air Conditioners
- Lighting & Fans
- Motors & Pumps
- Desktops & Printers

The main sources of energy to meet the required consumptions are as follows:

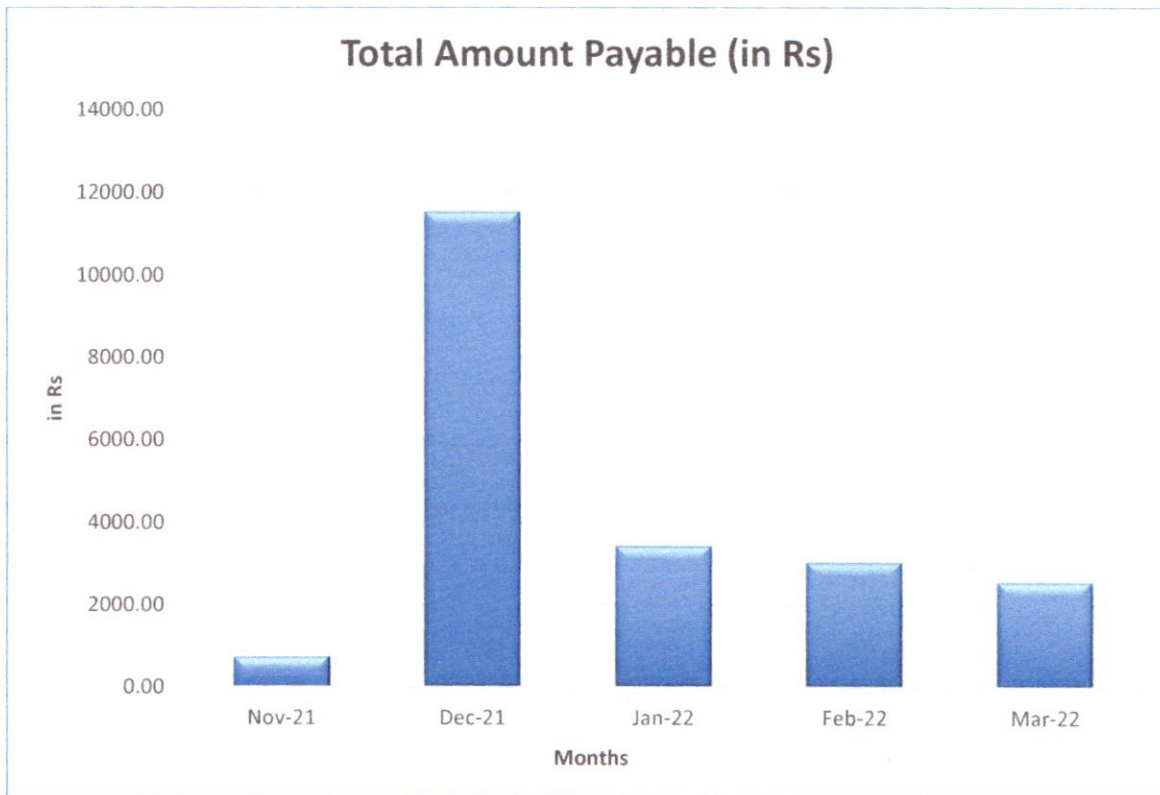
- Electricity supply from Power Distribution Company.
- DG set of rating 125KVA.

Consumption pattern for energy is given below:

Available electricity bills for the year were collected and following is the summary. Some of the electricity bills for the period are missing.



Months	Total Amount Payable (in Rs)
Nov-21	740.00
Dec-21	11530.00
Jan-22	3430.00
Feb-22	3030.00
Mar-22	2560.00





Chapter 03: Lighting System

Following is the list of lights installed in the campus at various locations:

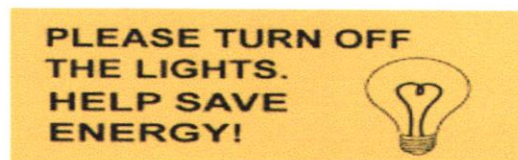
Type of lights (LED/CFL/Conventional Bulb/Tube Light)	Location	Rating	Quantity	Number of Hours being turned on
LED	Seminar Hall	36W	8	2
Tube Light	Class room (12)	36W	48	4
Tube Light	Laboratory (30)	36W	120	4
Tube Light	Library	36W	10	8
LED Tube Light	Washroom	20W	30	8
Tube Light	Office Area	36W	5	6

Observation:

It was observed that fluorescent tube lights are installed at major locations while LED lights are also installed at various locations. College is in process of periodic replacement of fluorescent lights with energy efficient LED when lights are getting faulty or damaged.

Recommendation:

- Sticker to SWITCH OFF LIGHT and SAVE ENERGY to be displayed.
- Regular cleaning of light fixtures to be done to get maximum lux level.





Chapter 04: Pumps and Motors

Pump is generally used for pumping of ground water to the water tank. The details of the pumps are given below:

Name of Pump and make	Running Hours	Rated Capacity in KW	Flow Rate	Head	RPM
Texmo	1	0.75	-	10	1440

Various motors are used for practical purposes in the laboratories. The list of motors present in the laboratories are given below:

Name of Motor and make	Running Hours	Rated Capacity in KW	Efficiency	Ampere	RPM
DC Shunt Motor	01	2.2	90%	4.2	1500
DC Series Motor	01	2.2	90%	4.2	1500
Slip ring induction motor	01	2.2	90%	4.2	1500
Three Phase Induction Motor	0.5	2.2	90%	4.2	1440
Synchronous motor (Swapnagandha)	01	2.2	90%	4.2	1500
Squirrel Cage Induction Motor (ELMO)	0.5	2.2	90%	4.2	1440
Induction Motor	1	0.75	90%	3.2	440
Shunt wound DC Motor	1	2.2	90%	4.2	1500
Squirrel Cage Induction Motor	0.5	2.2	90%	4.2	1440
Dc Motor	0.5	0.37	90%	1.2	1440
Three Phase Induction Motor	0.5	2.2	90%	4.2	1440
3 Phase Synchronous motor	0.5	2.2	90%	4.2	1440



Observation:

All pumps and motors are functioning properly and well maintained.

Recommendation:

Proper maintenance and upkeep of pumps and motors to be done.



Chapter 05: Air Conditioning

Split and Window Air Conditioners are used in the facility for air conditioning. Following is the list of ACs present in the campus:

Type of AC (Windows/Split/Package and Location)	Capacity in Ton	Whether any star rating available	Set Temperature	Running Hours	Whether AC performance is satisfactory (Yes/No)
Windows (Seminar Hall)	1.5	3	26	8	Yes
Backup Room	1.5	3	25	8	Yes
Computer Centre (Server Room)	1	3	26	8	Yes

Observation:

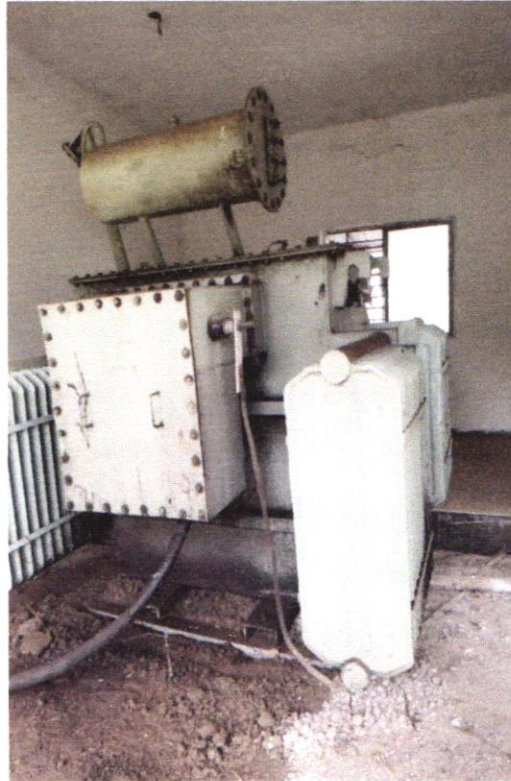
- All air conditioners are found to be functioning properly and well maintained.

Recommendation:

- All doors to be kept closed while using the air conditioners and regular annual service of AC's should be carried out.
- Set Temperature of Air Conditioner shall be maintained at 26°C to get desired efficiency and energy savings.
- A reduction in 1°C set point temperature, the energy cost comes down by 5%. By carefully selecting the seasonal temperature in different areas as per requirement considerable saving on account of power consumption can be achieved.
- Whenever Air Conditioners are replaced in future, BEE 5 star rated air conditioners shall be considered which are highly energy efficient.



Photographic Evidence



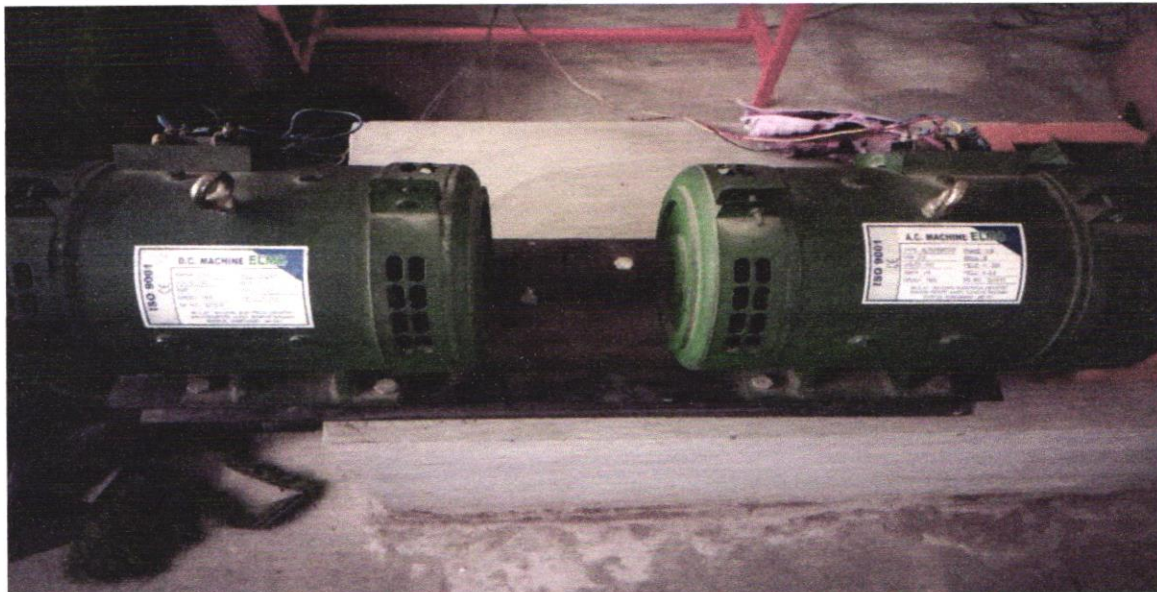
Transformer



DG Set



Air Conditioners



Laboratories Motor



Conclusion

The energy audit conducted at HSBPVT GOI Faculty of Engineering has revealed that college is doing good work in having sustainable college. To further reduce energy consumption, college should implement the recommendation made in report.

The recommended control measures were based on observation and experience of the energy audit team.

End of Report



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