Criterion - 7

Institutional Values and Best Practices

NAAC- SSR (2nd Cycle)

ETERNAL UNIVERSITY

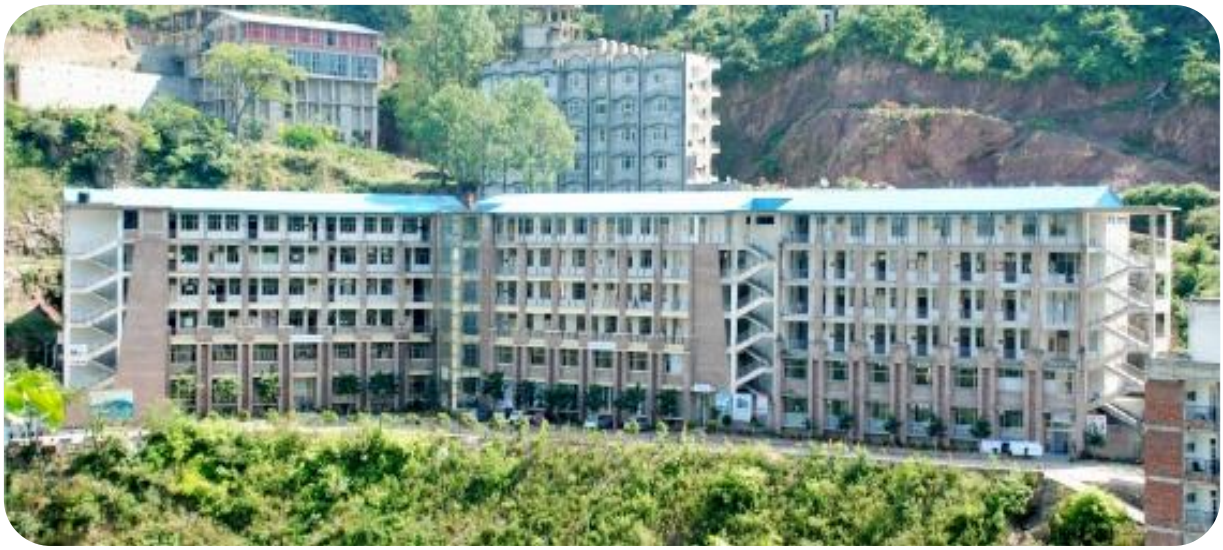
BARU SAHIB, SIRMOUR-173101
HIMACHAL PRADESH

7.1.6(1)

Policy document on environment and energy usage certificate from the auditing agency

ETERNAL UNIVERSITY
BARU SAHIB, SIRMOUR-173101
HIMACHAL PRADESH

EU ENVIRONMENT POLICY



ETERNAL UNIVERSITY

Baru Sahib, District Sirmaur, Himachal Pradesh-173101

Eternal University Environment Policy

Eternal University is a clean, green, smoke free campus which supports only vegetarian food among all its students, faculty, staff and visitors. Eternal University's Environment Policy is a guiding document for the faculty, staff and students of the institution, associated colleges and their departments for the sustainability and conservation of the environment.

The university has continuously shown a credible concern towards conservation of healthy environment to minimize the effect of pollutants, if any, on environment by taking proper initiatives. The policy encourages faculties, students and staff of the organization to build an eco-friendly attitude responsive for safeguard and conservative use of natural resources. The policy complies with the local government legislature and supports the 2030 vision of achieving Sustainable Development Goals (SDG) of government of India.

The content of the policy will be highly motivating to inculcate awareness and interest among students and faculty for conservation of environment in decision making at all levels by the organization and to ensure awareness among all for the conservation of natural resources. This policy encourages the activities and initiatives on forestation, landscape, and ecosystem restoration and protection, soil and water conservation, water quality maintenance, waste management, clean energy resources climate change mitigation etc.

1. Statement and Objectives of the Policy

The Environment Policy of Eternal University will be to conserve natural environment, develop sustainable development solutions, create awareness among students, staff, and people of the area for promoting eco-friendly activities. For attaining the aforesaid vision of the policy statement, following policy objectives has been framed:

1.1. To educate and engage students, staff, and general public about judicious use of natural resources and development of sustainable environment in the region.

1.2. To include environment policy in every activity of planning and decision-making process of institutional affairs.

1.3. To develop an attitude among students, staff and general public for adopting ways of working style in harmony with nature in day-to-day activities in the house, workplace and fields.

1.4. To recognize and appreciate the efforts of faculty and students and the institution towards maintenance of environment conservation and sustainable development.

1.5. To promote the recycling activities of institutional waste (solid and liquid waste) for minimizing waste and reducing the effect of environmental pollution.

1.6. To ensure collaboration in governmental, NGO's, communities' program for conducting various activities for safeguarding environment.

1.7. Raising awareness and conducting training programs, mock drills for natural disaster, tree plantation drives for nature lover students and employees to deal with the situation.

2. Policy Implementation

Eternal University understands that ecological sustainability has been a key component of its social responsibility and therefore, strive hard to make an impact on environmental conservation by inspiring eco-friendly, professional, and safe operations in its organizational activities. It incorporated conservation of scare resources, raw materials, use of energy and water, reducing CO_2 emissions and waste. Eternal University has adopted a fair; eco-friendly approach that covers every behavioral aspect related to planning and decision making. Solar energy has been promoted to substantially reduce the use of fossil fules.

3. Environmental Management Plan

The waste generated due to human activities at the University campus is handled by skilled personnels. The collection and proper disposal of waste is taken care of by the Management of The Kalgidhar Trust. Every student is

taught a course on Environment aspects to create awareness among them for a healthy natural environment.

3.1 Solid Waste Management: Solid waste is collected by the garbage management vehicle from various spots and dumped at specially designed place. The plastics, papers and organic waste are segregated. Plastics are recycled for making bricks and flower pots. Papers are recycled to make cardboards and file covers; while organic waste is used for making compost. The organic waste viz. leaves, woods, vegetable waste etc. is used for future fuel (fuel in the form of logs).

3.2 Food Waste Management: The food waste is dumped in oil traps for the collection of oil. Further, the collected oil may be utilized as a fuel and for greasing purpose. The food waste left after the removal of oil is used for vermin-composting.

3.3 Cattle Waste Management: The cattle waste is recycled through biogas plant for the generation of bio-methane (Biogas). It is also used as a raw precursor in vermin-composting unit.

3.4 Liquid Waste Management: The liquid waste is treated through the sewerage plant and remnant is aerated for stabilizing the suspended solids. The solids settled are used as compost while a portion of the treated water is used for irrigation of our agriculture farms.

3.5 Biomedical Waste Management: For Biomedical waste, sharp pits and ash pits are utilized to prevent spread of disease. Sanitary pads are separated and incinerated.

3.6 E-Waste Management: E-waste is collected and disposed to the specific vendor at Solan/Baddi.

Under the waste management plan, special dust bins are placed at specific points throughout the campus.

4. Inclusion in curriculum

4.1. Eternal University model curriculum to include subjects that enhance environment management, and conservation.

4.2. Induction program for students is conducted to spread awareness about environmental issues and community-based activities are also organized to make the masses aware about environment health in their life.

4.3. EU facilitates the development and funding of research areas such as drinking water supplies, carbon neutral agricultural and rural industries etc.

5. Promoting Environmental Responsibility in the University Campus

5.1. To promote environmental awareness and eco-friendly culture among all (Teaching/ non teaching staff and students). This is the responsibility of all residents of the campus; therefore, each and every individual tries its best to execute such activities in accordance with existing environmental policy.

5.2. To participate for achieving the goals set by Eternal University regarding environmental management, energy efficiency, climate change mitigation and adaptation processes and hence consequent contribution to attain sustainable development.

5.3. Development of initiatives that aim to achieve organizational awareness of environmental, energy and climate change for the issues required to be addressed through raising awareness and outreach community based activities.

5.4. Contribution to research, development and dissemination of scientific and technological knowledge focused on environmental conservation, the preservation of biodiversity and renewable energy resources thus regarding carbon foot print and mitigating climate change.

6. Action Plan

- Creating awareness among stakeholders.
- Organizing tree plantation campaigns from time to time.
- Maintenance of greenery on the campus.
- Organizing awareness programmes among the farmers for vermin-culture, composting, biogas, irrigation techniques etc.

- Celebration of International wetland day, International Earth day, International Water day, Consumer awareness day etc.
- Organizing lectures of eminent environment speakers, from time to time.
- Organization of national and international conferences on Environment conservation and climate change.
- Organizing rallies on various themes of environment conservation and sustainable development.
- Educating students about invasive species and their possible control.

Policy Framed by:

Dr. Puneet Negi, Assistant Professor and Head,
Department of Physics, Akal College of Basic Sciences,
Eternal University Baru Sahib-173101

Dr. Yashpal Azad, Assistant Professor,
Department of Psychology,
Akal College of Arts and Social Sciences,
Eternal University Baru Sahib-173101

Vice Chancellor
Eternal University
Baru Sahib (H.P.) 173101

ETERNAL UNIVERSITY

BARU SAHIB, DISTT SIRMAUR, NEAR RAJGARH,
HIMACHAL PRADESH 173101

ENVIRONMENT AUDIT REPORT

PREPARED BY
EHS ALLIANCE SERVICES

TABLE OF CONTENT

AUDIT CERTIFICATE

EHS alliance

CERTIFICATE NO. EHSAC48B

CERTIFICATE

PRESENTED TO

M/S ETERNAL UNIVERSITY

Baru Sahib, Distt Sirmaur, near Rajgarh, Himachal Pradesh, 173101

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

ENVIRONMENT AUDIT

The environment legal compliances and initiatives carried out by the University have been verified on the report submitted and was found to be satisfactory.

The efforts taken by management and faculty towards environment and sustainability are highly appreciated and noteworthy.

SIGNATURE

EHS ALLIANCE SERVICES GURGAON

27.10.2021
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
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ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Eternal University for assigning this important work of Environment Audit. We appreciate the co-operation to the teams for completion of assessment.

We would also like to thank Dr. Narinder Pal Singh, Dean Research (Volunteering) of the University for his Continuous Support and guidance, without which the completion of the project will not be possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Dr. B.S. Sohal - *Dean PGS*

Dr. A.S. Ahluwalia *– Pro VC*

Dr. S.K Sharma *– Dean DKSGACA*

Mr. Santosh Shukla – *Incharge AHKS*

Last but not the least; we would like to thank Dr. Davinder Singh, VC of Eternal University for giving us an opportunity to evaluate the environmental performance of the campus.

DISCLAIMER

EHS Alliance Services Audit Team has prepared this report for Eternal University based on input data submitted by the representatives of University complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

If you wish to distribute copies of this report external to your organisation, then all pages must be included.

EHS Alliance, its staff and agents shall keep confidential all information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

EHS Alliance staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

Signature

LEAD AUDITOR

CONCEPT AND CONTEXT

In India, the process for environmental audit was first mentioned under the Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment auditing, the University management decided to conduct an external environment assessment study by a competent external professional auditor.

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 Environment 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."

This audit focuses on the environment legal compliances and implementation of rules defined by MoEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is very precious gift for all life forms. Disturbance in the nature causes environmental Problems. These are increasing day by day as a result of development of urbanization and industrialization on earth. Because of unplanned utilization of resources, our planet is facing tremendous pressure results a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of the resources in sustainable manner in order to conserve natural resources for future generation.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources in judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

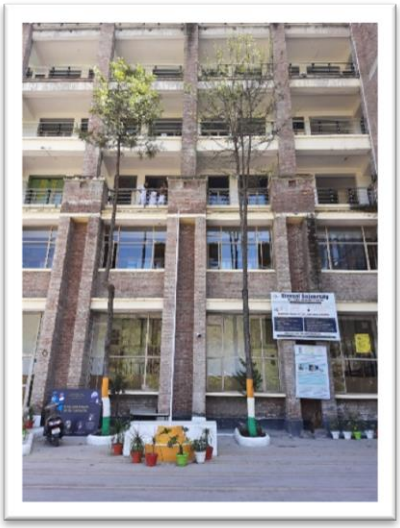
Environmental auditing had begun in the early 1970s with provision of civil lawsuits fornon- compliance with environmental regulations. Environment auditing involves on site visit, collection of samples, performing analyses, and report results to competent authorities.

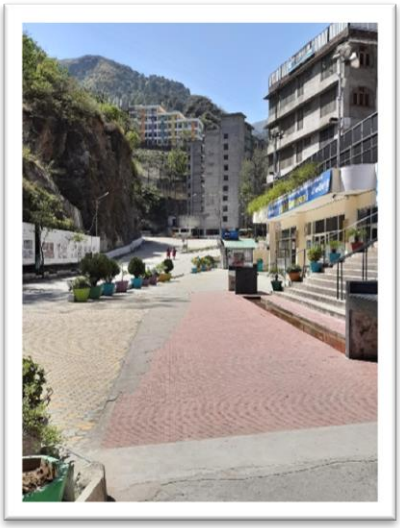
Industry, the corporate world is initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

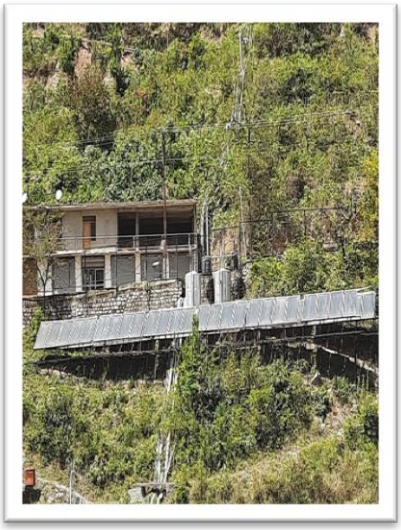
In thin "Environment Audit" report would help everyone to think about preserving resources, show willingness to learn their importance, adopt steps to minimize resource use and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in minimization of environmental risks at low cost.

OVERVIEW OF THE UNIVERSITY

Eternal university is NAAC Accredited & ISO 9001: 2015 Certified University established under the Himachal Pradesh Private University (Establishment & Regulation) Act 2006 & Himachal Pradesh Government Act.no. 3 of 2009, with the right to confer degree as per the UGC public notice on private Universities dated April 18, 2011.







The great visionary of 20th century (Sant Attar Singh Ji) had a vision that modern scientific education alone will not serve the humanity well, until and unless it is amalgamated with Braham Vidya (Spiritual Education). The graduates of this unique education system will not only be outstanding in academics, but also will have high moral values (i.e. they will have love for humanity, compassion for the weak and the underdog, and sense of selfless service for the community). These graduates will work towards establishing permanent peace in the world. They will act as Ambassadors of Peace wherever they live, work and raise their families.

Eternal University with its seven constituent colleges is unique in imparting value based education to girl students and is the first private university of Himachal Pradesh to start College of Nursing, School of Public Health and College of Agriculture. Among several previous recognitions the Eternal University has been recently recognized as “The 20th Best Higher Education Institution in India, 2019 which are providing a broader perspective and cutting edge higher education with a focal point on fostering skills and innovation” by EDUCATION BRAINIAC magazine.

In a largely residential campus the day-scholar girl students from nearby areas of Sirmaur district who could commute from home can now also pursue their studies in the Eternal University. Situated in the Valley of Divine Peace the Modern Gurukul is providing safest, drug and pollution free environment with facilities such as sports complex, gymnasium, NSS and NCC units, experimental farms, poly houses, modern dairy complex, solar power utilization systems and support for holistic development of its students. The Eternal University has organized several conferences, workshops, camps and Kisan Melas with emphasis to address the crucial problems of farmers of Sirmour and adjoining districts of Himachal Pradesh for their inclusive development.

University offers 17 Bachelor programmes, 27 Master Programmes and 19 Doctorate Programmes.

Bachelor Programme	Masters Programme	Doctorate Programme
B.Sc. (Hons) Agriculture	M.Sc. Biotechnology	Ph.D. Biotechnology
B.Tech. Food Technology	M.Sc. Agronomy	Ph.D. Food Technology
B.Tech. CSE	M.Sc. Ag. Genetics & Plant Breeding	Ph.D. CSE
B.Sc. Information Technology	M.Sc. Ag. (Entomology)	Ph.D. Botany
B.Sc. Non-Medical	M.Sc. Ag. (Horticulture) Vegetable Science	Ph.D. Chemistry
B.Sc. (Hon.) Mathematics	M.Sc. Ag. (Horticulture) Fruit Science	Ph.D. Microbiology
B.Sc. (Hons.) Microbiology	M.Sc. Ag. Horticulture (Floriculture & Landscape Architecture)	Ph.D. Mathematics
B.Sc. (Hons.) Economics	M.Sc. Ag. Plant Pathology	Ph.D. Physics
B. Ed		Ph.D. Zoology
B.Com (Hons.)		Ph.D. Economics
B.B.A.New		Ph.D. Management
B.A. (Hons.) Music		Ph.D. English
		Ph.D. Music

B.A. Humanities B.Sc. (Hons.) Psychology B. Lib B.Sc. Medical B.Tech. CSE Lateral/Migrated	M.Sc. Agricultural Economics M.Sc. Food Science & Technology M.Tech. Food Technology M.Tech. CSE M.Sc. Botany M.Sc. Chemistry M.Sc. Mathematics M.Sc. Microbiology M.Sc. Physics M.Sc. Zoology M.P.H M.Sc. Economics M.Com. Master of Business Administration M.A. Music M.A. (Hons.) Punjabi M.Sc. Psychology M.A. English M.A. Education	Ph.D. Public Health Ph.D. Horticulture(Veg Science) Ph.D. Agronomy Ph.D. Entomology Ph.D. Commerce Ph.D. Punjabi

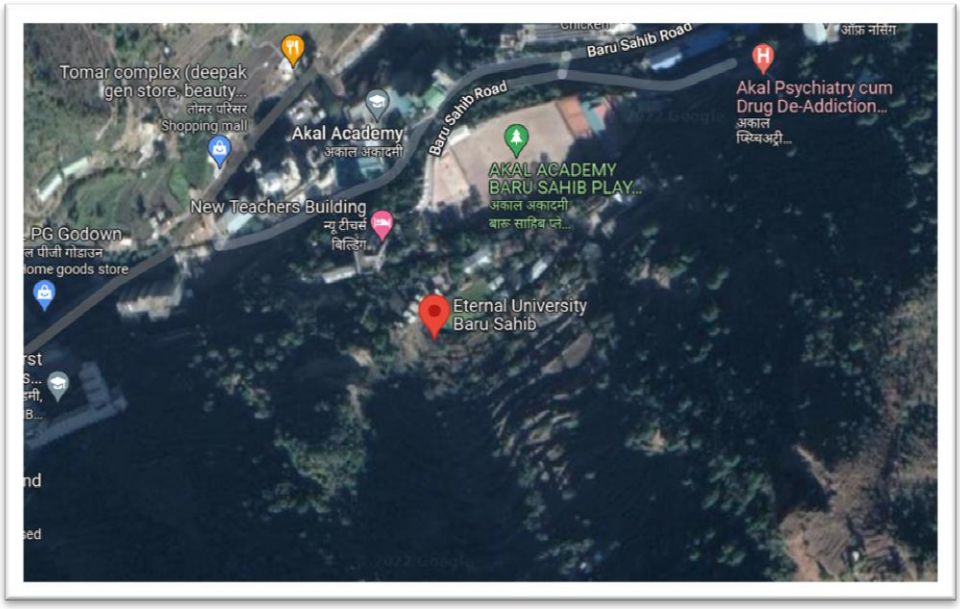
MISSION

- "To transform and empower young women talent through cutting edge education in science, technology, arts and management amalgamated with spiritual rejuvenation for their holistic development to serve the mankind with compassion and love."

VISION

- "The relatively young Eternal University with its diverse programmes, priorities, commitments, values and efforts strives to emerge as a world-class women university with its centers of excellence in science, technology, arts and management. Major emphases will be focused on developing and strengthening industrial-institution linkages and harnessing strength of its alumni for skill development, technology transfer, resources generation and employment opportunities. Its graduates engrossed with holistic development, human values, professional ethics and skills and entrepreneurship will adapt and earn confortable livelihood and serve the mankind with love and devotion for its inclusive and sustainable development as our ambassadors of universal brotherhood for world peace."

Geo Location



Geo Coordinates from Google maps: 30.753674, 77.296542

AUDIT PARTICIPANTS

On behalf of University

Name and Designation
*Dr. Narinder Pal Singh – **Dean Research***
*Dr. B.S. Sohal - **Dean PGS***
*Dr. S.K Sharma – **Dean DKSGACA***
*Dr. A.S. Ahluwalia – **Pro VC***
*Mr. Santosh Shukla – **Incharge AHKS***

On behalf of EHS Alliance Services

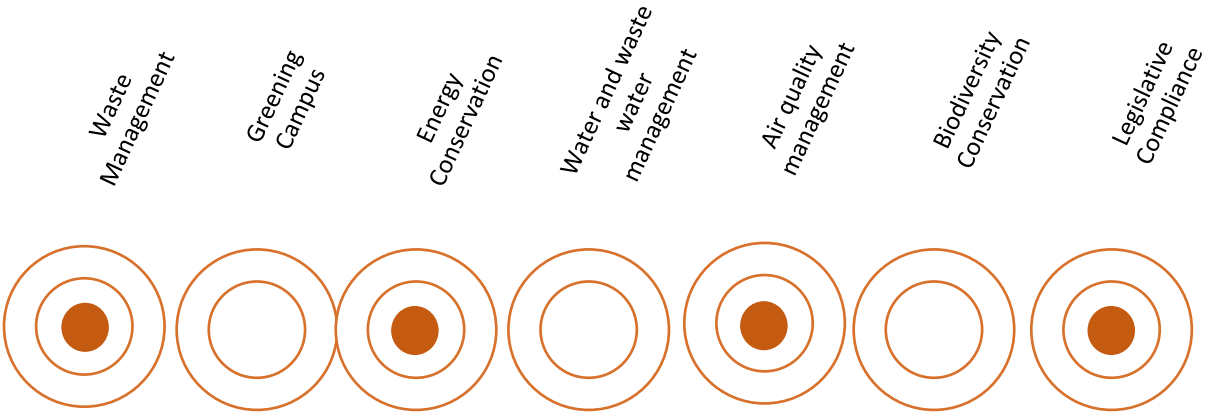
Name	Position	Qualifications
Dr. Uday Pratap	*Lead Auditor*	*Ph.D. , PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Pooja Kaushik	*Co-Auditor*	*M.Sc, Field Expert, QCI – WASH*

EXECUTIVE SUMMARY

The environment 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 out-dated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. Our approach to promote a Green Campus to inculcate the sustainable value systems among the students, so that they carry the learning and practices them in their future endeavours. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to environmental, social and economic needs of the mankind.

This is very first environment audit of University for doing their bit 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.



WASTE MANAGEMENT

TYPES OF WASTE ON UNIVERSITY CAMPUS

To create effective waste management plans, university first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campus:

1. **Food Waste** - University campus generates food waste. The average mess and canteen generates approximately 10 kg of food waste a day. The reasons for food waste on an educational campus may be over purchasing food to ensure a sufficient supply and then throwing it away, especially in all hostel messes where plentiful stores are essential. And in the cafeteria or hostel mess, students may pile food onto their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.

2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential to late-night studying or socializing tend to come in recyclable plastic, glass or aluminium containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. Quantitative analysis should be carried out to reduce waste in coming academic sessions.

3. **Student Clothes and Housewares** - As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them. University should adopt a donation camp in summer and winter season to help needful people.

4. **E – Waste - Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computers to keep up with the latest technology, the old computers have to go somewhere. So do old printers, phones, copy machines and other electronics that receive upgrades over the years. Discarded student electronics often become part of a university's waste stream as well. Students may throw away old phones, TVs, tablets, laptops and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. University has tie-up with external authorised agency details mentioned in legislation compliances.

5. **Chemical Waste -** Chemical waste on a university campus may come from numerous sources. Campus laboratories generate waste chemicals, as do cleaning services. The detergents used in campus laundry rooms eventually become waste as well. Much of these chemical substances

are hazardous waste under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and must undergo specific disposal processes according to state environmental rules and regulations.

6. **Maintenance Waste -** In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

7. **Biological Waste -** Biological waste from laboratories and campus medical centres will require special handling and disposal as per BMW Rules, 2016. Tissue from biology and cadaver labs forms biological waste, as do tissue samples, contaminated bandages and used sharps from medical facilities.

8. **Furniture** - Furniture waste on a university campus has a couple different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to junk dealer.

9. **Books/Magazines/Newspapers -** Books accounted for solid waste generation and university often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students, too, may find it more convenient merely to throw away their books at the end of the year rather than donating or reselling them.

10. **C & D Waste -** Due to expantion of university campus building and renovation works result significant amount of construction and demolision waste that should be either used for back filling or disposed off through authorised dumping site by CPCB/SPCB.

11. **Municipal Solid Waste -** The University is managing solid waste by its own through waste treatment plant that has competent & trained personnel.

12. **Horticulture Waste** – University campus has lavish greenery and grounds that results significant horticulture waste which is managed by in-house composting system.

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

   - *Electricity saves by use of LED bulbs for illumination*
   - *LPG saves by use of Pressure cookers for cooking food.*
   - *Solar heaters usage in kitchens and hostels*
   - *200 kW Solar power plant installed, to save Grid electricity*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

   Yes, Renewable source of energy through 200 KVA solar panel is operational

3. **How many CFL/LED bulbs has your institute installed?**

   40 % of Total Conventional bulbs and tube lights are replaced by LED/CFL Lights.

4. **Do you run "switch off" drills at institute?**

   Yes

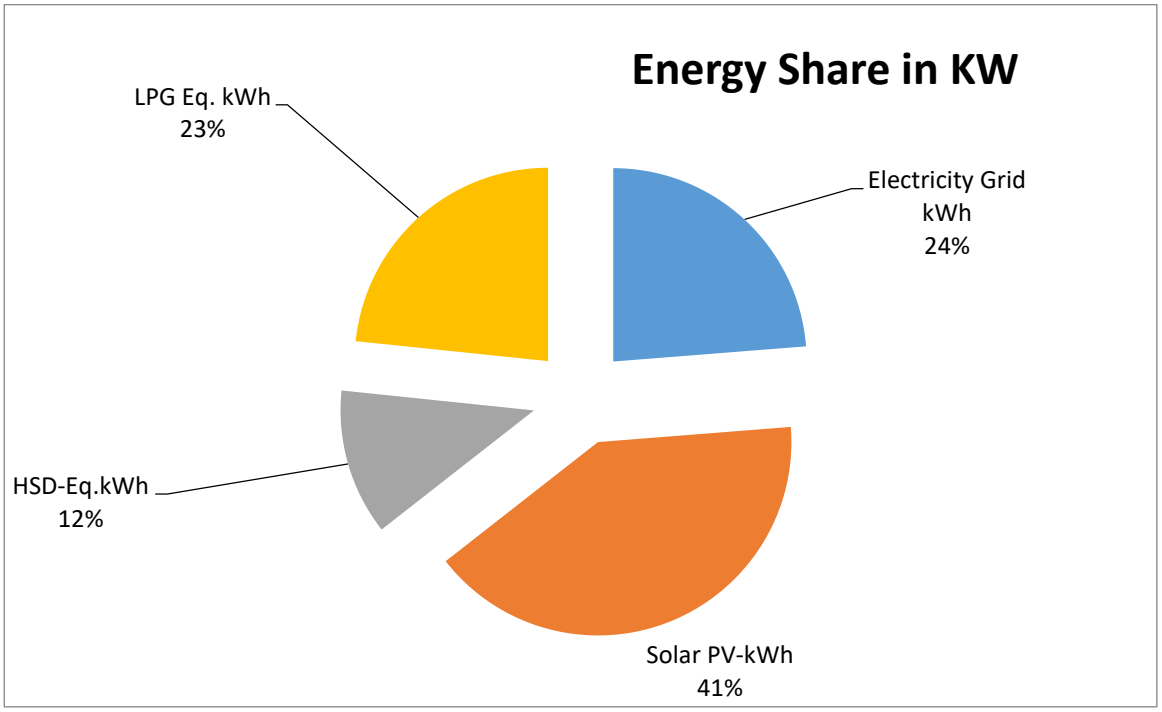
5. **Are your computers and other equipment's put on power-saving mode?**

   Yes, In Practice

6. **Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?**

   Yes, approx. 6 hours

Energy Share	kWh	Percentage
Electricity Grid kWh	168,111.07	23.75%
Solar PV-kWh	288,000.00	40.69%
HSD-Eq.kWh	86,434.07	12.21%
LPG Eq. kWh	165,325.49	23.36%
Total -kWh	**707,870.62**	**100%**



WATER AND WASTE-WATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:

Drinking – 38.2 KL/month

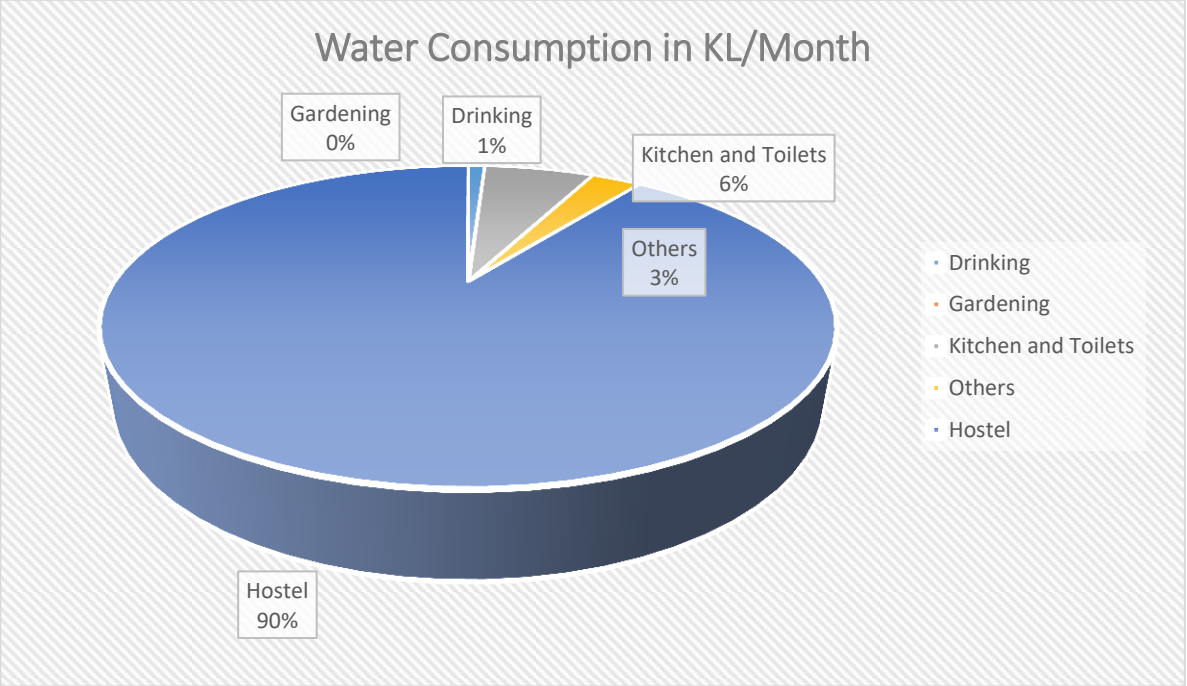
Gardening – 0 Kl/month ***(STP Treated water is being used for gardening)***

Kitchen and Toilets – 251.8 KL/month

Others – 113.9 KL/month

Hostel – 3580.2 KL/Month

Total = 3984.1 KL/Month



2. How does your institute store water? Are there any water saving techniques followed in your institute?

Storage: Water is stored in multiple water tanks situated at the roof of building and then it is transferred to different areas of the university to fulfill the water requirement for different purposes.

Saving Techniques: Avoid overflow of water controlled valves are provided in water supply system. Close supervision for water supply system. Avoid overflow of water controlled valves are provided in water supply system. Close supervision for water supply system.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Point of Entry - Natural Spring Water

Point of Exit –

1. *From Canteen, Toilets, bathrooms by covered drainage which is connected to (1000 KLD) STP in campus area.*

2. *From labs and medicals, to STP (35 KLD)*

And, then, provided to Agriculture Farms

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*
- *Water Conservation awareness for new students*
- *Initiate the installations of water less urinals*

5. Does your institute harvest rainwater?

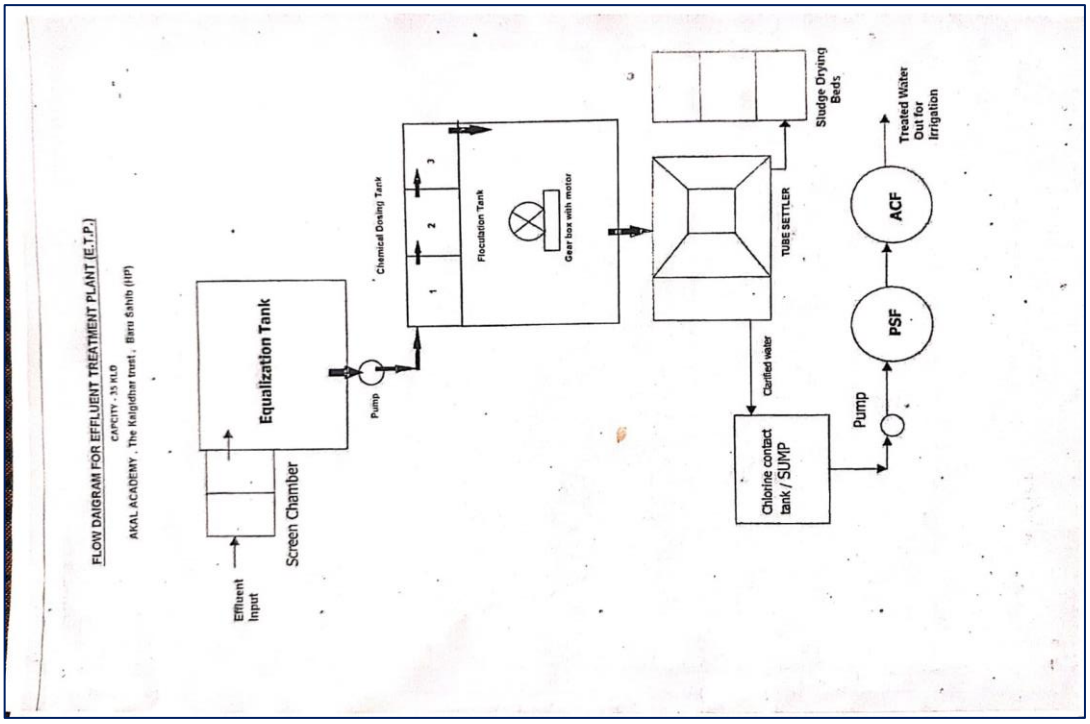
No

6. Is there any water recycling System?

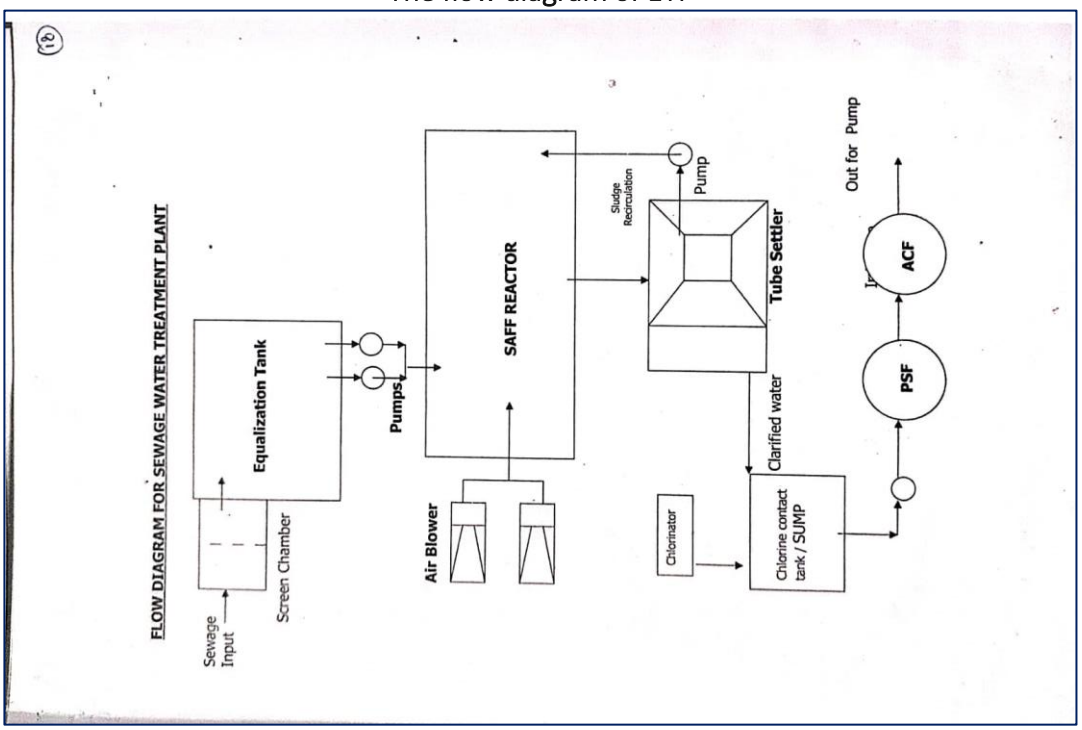
STP – 1000 KLD
ETP – 35 KLD

Zero liquid discharge (ZLD) is a strategic wastewater management system that ensures that there will be no discharge of industrial wastewater into the environment. It is achieved by treating wastewater through recycling and then recovery and reuse for flushing, gardening, Dg cooling and housekeeping purpose. 1000 KLD STP and 35 KLD ETP are for hospital installed and functional in Campus as per Environment Clearance from State Pollution Control Board dated.

Below are the flowchart diagrams for ETP and STP plant in Eternal University.



The flow diagram of ETP



The flow diagram of STP

AIR QUALITY MANAGEMENT

1. Are the Rooms in Campus are Well Ventilated?

Yes, as per National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization

3. What is the ownership of the vehicles used by your campus?

University and Personal owned vehicles only

4. Provide details of university-owned vehicles?

Details of the vehicles are as follows
Bus – 5
Cars – 6
Vans – 2
Others – 2
Total – 15

5. PUC done?

Yes

6. Specify the type of fuel used by your campus's vehicles

All vehicles use diesel. There are no Petrol or CNG vehicles in the campus.

7. Air Quality Monitoring Program (If, Any)

Yes, with university equipment.

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. Are you aware of any environmental Laws Pertaining to different aspects of environmental management?

Yes, faculty members and administrative team is well aware of national environmental laws.

2. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, innovative initiatives are being taken by campus to reduce pollution and go green.

3. Does Environmental Ambient Air Quality Monitoring conducted by the Institute?

Yes

4. Does Environmental Water and Waste water Quality monitoring conducted by the Institute?

No

5. Does stack monitoring of DG sets conducted by the Institute?

Yes, by NABL approved Laboratory.

6. Is any warning notice, letter issued by state government bodies?

No

7. Does any Hazardous waste generated by the Institute?

Yes, BMW is managed by ETP

GENERAL

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, SDG committee takes decisions for environment protection in campus, for example – reuse of waste plastic into bricks and pots, making file covers from used papers, etc.

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, Periodically pollution reduction, plantation, energy conservation awareness campaigns carried out by institute

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, Earth Day, Ozone day, World Environment Day, and more are celebrated by campus.

4. Does Institute participate in National and Local Environmental Protection Movement?

Yes, Swatch Bharat Abhiyan by students at campus

5. Does Institute have any Recognition or certification for environment friendliness?

Yes, Earth Day, Ozone day, World Environment Day, and more are celebrated by campus.

6. Does Institute participate in National and Local Environmental Protection Movement?

Yes, for e waste management recognition certificate (copy attached)

7. Does Institution conduct a green or environmental audit of its campus?

This is the first external audit carried out by the university.

8. Has the institution been audited /accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?

Yes, periodically audited by such agencies for continual improvement. (Please provide certificates of NABL)

RECOMMENDATIONS

- Green building guidelines with ECBC compliance should be adopted for future expansion projects/ buildings of the university.
- Provide sanitary waste disposal facility as per the CPCB guidelines for management of sanitary waste (as per Solid Waste Management Rules, 2016). Installation of Incinerator is recommended in campus
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Stack Monitoring of DG sets, Water monitoring need to be conducted by State Pollution Control Committee, approved laboratory)
- An environmental policy document should be displayed in campus with all the recommendations and current practice carried by Eternal University.
- Environmental parameters should be included in purchase policy to achieve cradle to grave approach for sustainability.

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 80% of University campus is for landscaping. The audit has identified some observations for making the campus premise more environment friendly. The recommendations are also mentioned with observations for University campus team to initiate actions. The audit team opines that the overall site is well-maintained from environmental perspective. Still there are few things that are important to initiate urgently which includes installation of incinerator, air quality monitoring and periodic inspection of buildings to increase the energy efficiency.

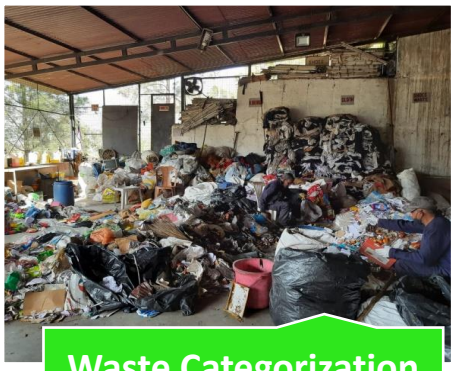
REFERENCES

- **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 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**

ANNEXURE PHOTOGRAPHS – WASTE MANAGEMENT AND RECYCLING

Plastic Waste Recycling to Flower Pots

Plastic Waste recycling to Sand Bricks



Waste Categorization and Recycling

Vermi Coposting in Campus

Colour Coded Dust Bins in Campus

Paper Waste Recycling

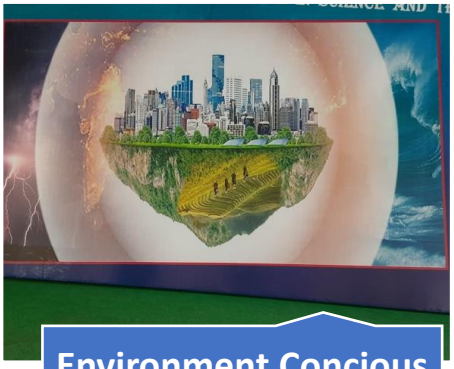
Solar PV

Solar Heaters

Solar PV for Green Energy

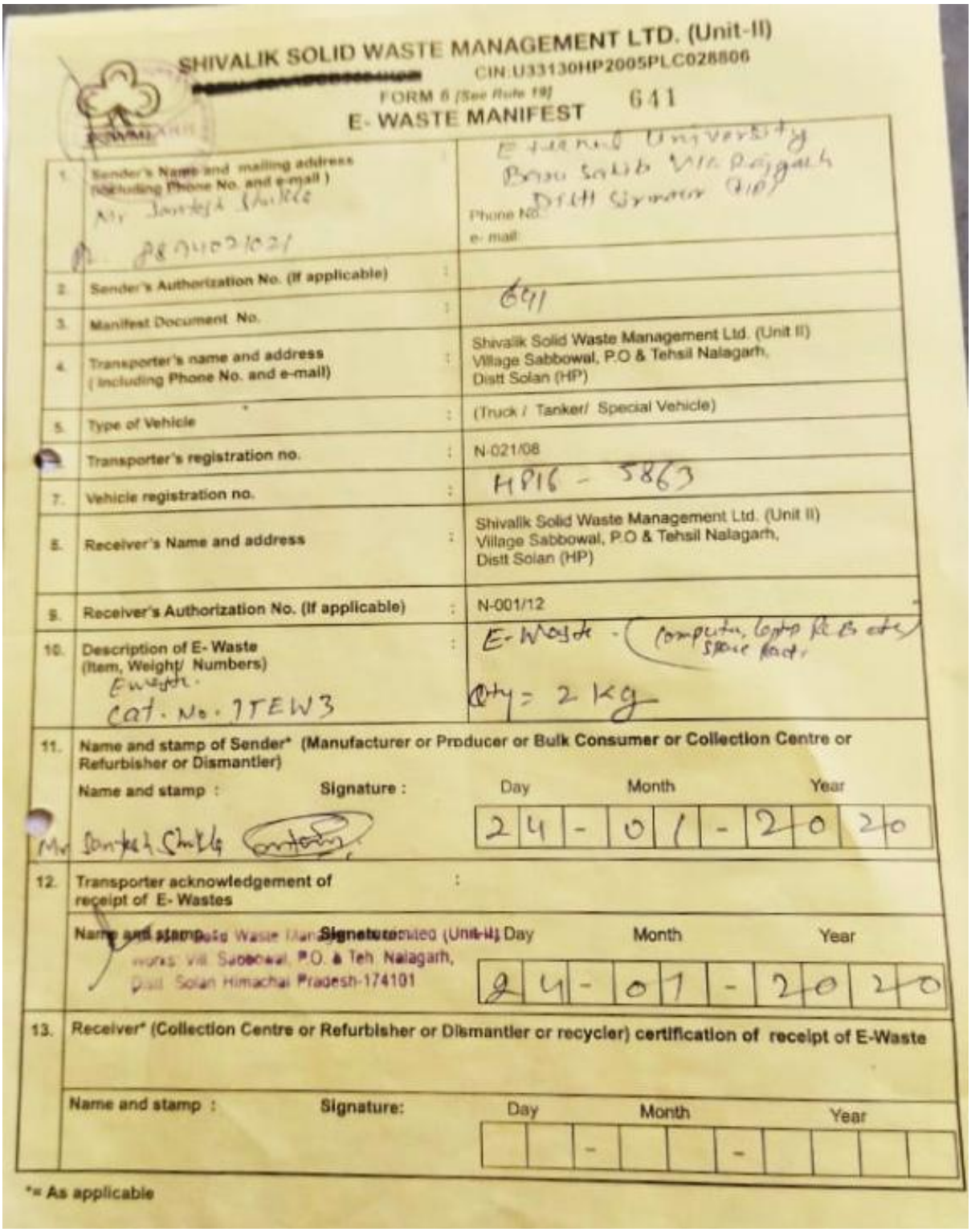
Solar PV 200 KW

Public Common Transport



Environment Concious Posters in Campus

MOU FOR E-WASTE MANAGEMENT



SHIVALIK SOLID WASTE MANAGEMENT LTD. (Unit-II)
CIN:U33130HP2005PLC028806
FORM 6 [See Rule 19] 641
E- WASTE MANIFEST

1.	Sender's Name and mailing address (including Phone No. and e-mail)	Eternal University Baru Sahib Vill Paigarh Distt Sirmour (HP) Phone No. e-mail
2.	Sender's Authorization No. (If applicable)	
3.	Manifest Document No.	641
4.	Transporter's name and address (Including Phone No. and e-mail)	Shivalik Solid Waste Management Ltd. (Unit II) Village Sabbowal, P.O & Tehsil Nalagarh, Distt Solan (HP)
5.	Type of Vehicle	(Truck / Tanker/ Special Vehicle)
6.	Transporter's registration no.	N-021/08
7.	Vehicle registration no.	HP16 - 5863
8.	Receiver's Name and address	Shivalik Solid Waste Management Ltd. (Unit II) Village Sabbowal, P.O & Tehsil Nalagarh, Distt Solan (HP)
9.	Receiver's Authorization No. (If applicable)	N-001/12
10.	Description of E- Waste (Item, Weight/ Numbers)	E-Waste - (computer, laptop PC & etc) Qty = 2 kg

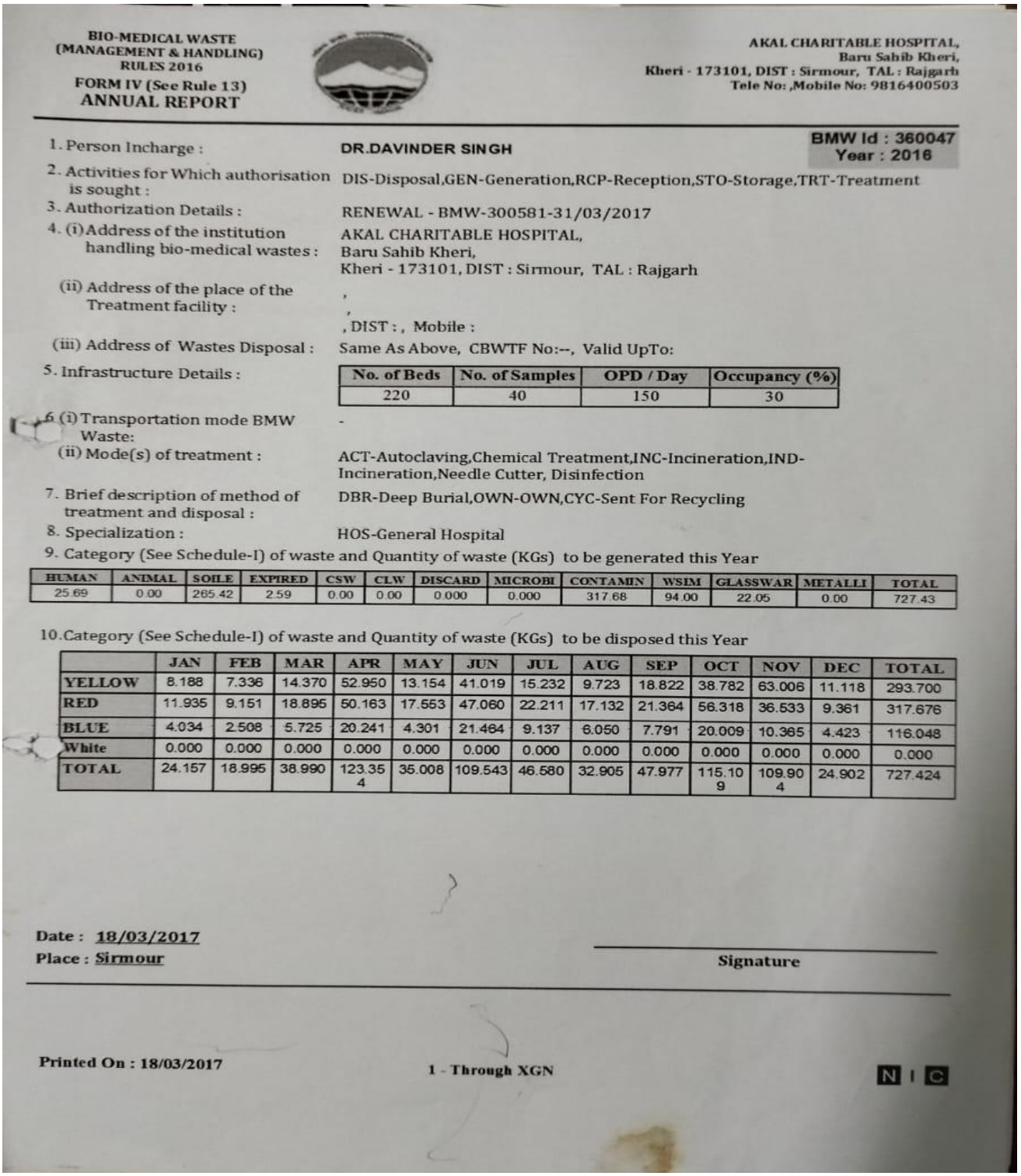
11. Name and stamp of Sender* (Manufacturer or Producer or Bulk Consumer or Collection Centre or Refurbisher or Dismantler)
Name and stamp : Signature : Day 24 Month 01 Year 2020

12. Transporter acknowledgement of receipt of E- Wastes
Name and stamp: Shivalik Waste Management Ltd. (Unit-II) Signature: Day 24 Month 01 Year 2020
Works: Vill. Sabbowal, P.O. & Teh. Nalagarh, Distt. Solan Himachal Pradesh-174101

13. Receiver* (Collection Centre or Refurbisher or Dismantler or recycler) certification of receipt of E-Waste
Name and stamp : Signature: Day Month Year

*= As applicable

Bio-Hazardous Waste Management System/ MoU



BIO-MEDICAL WASTE (MANAGEMENT & HANDLING) RULES 2016
FORM IV (See Rule 13)
ANNUAL REPORT

AKAL CHARITABLE HOSPITAL,
Baru Sahib Kheri,
Kheri - 173101, DIST : Sirmour, TAL : Rajgarh
Tele No: ,Mobile No: 9816400503

BMW Id : 360047
Year : 2016

1. Person Incharge : DR.DAVINDER SINGH
2. Activities for Which authorisation is sought : DIS-Disposal,GEN-Generation,RCP-Reception,STO-Storage,TRT-Treatment
3. Authorization Details : RENEWAL - BMW-300581-31/03/2017
4. (i) Address of the institution handling bio-medical wastes : AKAL CHARITABLE HOSPITAL, Baru Sahib Kheri, Kheri - 173101, DIST : Sirmour, TAL : Rajgarh
   (ii) Address of the place of the Treatment facility : , , , DIST : , Mobile :
   (iii) Address of Wastes Disposal : Same As Above, CBWTF No:--, Valid UpTo:
5. Infrastructure Details :

No. of Beds	No. of Samples	OPD / Day	Occupancy (%)
220	40	150	30

6. (i) Transportation mode BMW Waste: -
   (ii) Mode(s) of treatment : ACT-Autoclaving,Chemical Treatment,INC-Incineration,IND-Incineration,Needle Cutter, Disinfection
7. Brief description of method of treatment and disposal : DBR-Deep Burial,OWN-OWN,CYC-Sent For Recycling
8. Specialization : HOS-General Hospital
9. Category (See Schedule-I) of waste and Quantity of waste (KGs) to be generated this Year

HUMAN	ANIMAL	SOILE	EXPIRED	CSW	CLW	DISCARD	MICROBI	CONTAMIN	WSIM	GLASSWAR	METALLI	TOTAL
25.69	0.00	265.42	2.59	0.00	0.00	0.000	0.000	317.68	94.00	22.05	0.00	727.43

10. Category (See Schedule-I) of waste and Quantity of waste (KGs) to be disposed this Year

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
YELLOW	8.188	7.336	14.370	52.950	13.154	41.019	15.232	9.723	18.822	38.782	63.006	11.118	293.700
RED	11.935	9.151	18.895	50.163	17.553	47.060	22.211	17.132	21.364	56.318	36.533	9.361	317.676
BLUE	4.034	2.508	5.725	20.241	4.301	21.464	9.137	6.050	7.791	20.009	10.365	4.423	116.048
White	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	24.157	18.995	38.990	123.354	35.008	109.543	46.580	32.905	47.977	115.109	109.904	24.902	727.424

Date : 18/03/2017
Place : Sirmour

Signature

Printed On : 18/03/2017

1 - Through XGN

N I C

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

ETERNAL UNIVERSITY

ENVIRONMENT AUDIT REPORT

2022-2023

PREPARED BY
EHS ALLIANCE SERVICES

TABLE OF CONTENT

AUDIT CERTIFICATE

EHS alliance

CERTIFICATE

PRESENTED TO

ETERNAL UNIVERSITY

Baru Sahib, Distt. Sirmour, near Rajgarh, Himachal Pradesh 173101

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

ENVIRONMENT AUDIT

ACADEMIC YEAR 2022-23

The environment legal compliances and initiatives carried out by the institution have been verified on the report submitted and were found to be satisfactory.

The efforts taken by management and faculty towards environment and sustainability are highly appreciated and noteworthy.

EHS ALLIANCE SERVICES GURGAON

SIGNATURE

29.05.2023
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 Eternal University for assigning this important work of Green Audit. We appreciate the cooperation of the teams for the completion of the assessment.

First of all, we would like to thank ***Prof. (Dr.) Davinder Singh, Hon'ble Vice Chancellor of Eternal University*** for giving us an opportunity to evaluate the environmental performance of the campus.

We are also thankful to

Prof. (Dr.) Amrik Singh Ahluwalia	Honorable Pro-Vice-Chancellor
Prof. (Dr.) B. S. Sohal	Controller of Examination and Dean-PGS
Prof. (Dr.) N. P. Singh	Dean, Research
Prof. (Dr.) Tusshar Mahajan	Professor, Management Department

We would also like to thank ***Dr. Puneet Negi - Assistant Professor and HoD, Physics Department*** for his Continuous Support and guidance, without which the completion of the project would not been possible. We are also thankful to other staff members actively involved in collecting the data and conducting field measurements.

DISCLAIMER

EHS Alliance Services Audit Team has prepared this report for Eternal University based on input data submitted by the representatives of the University complemented with the best judgment capacity of the expert team.

While all sensible 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 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.

If you wish to distribute copies of this report external to your organisation, then all pages must be included.

EHS Alliance, its staff and agents shall keep confidential all information relating to your organisation and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies.

EHS Alliance staff, agents and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

Signature

LEAD AUDITOR

CONCEPT AND CONTEXT

In India, the process for environmental audit was first mentioned under the Environment Protection Act, 1986 by the Ministry of Environment of forests on 13th march, 1992. As per this act, every person owning an industry or performing an operation or process needs a legal consent and must submit an environmental report or statement.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the sustainable environment.

In view of the NAAC circular regarding environment auditing, the University management decided to conduct an external environment assessment study by a competent external professional auditor.

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 Environment 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."

This audit focuses on the environment legal compliances and implementation of rules defined by MoEFCC or state pollution control board. The concepts, structure, objectives, methodology, tools of analysis, and objectives of the audit are discussed below.

INTRODUCTION

Nature is a very precious gift for all life forms. Disturbance in nature causes environmental Problems. These are increasing day by day as a result of the development of urbanization and industrialization on earth. Because of the unplanned utilization of resources, our planet is facing tremendous pressure resulting in a sharp rise in temperature. Therefore, there is an urgent need to plan the consumption of resources in a sustainable manner in order to conserve natural resources for future generations.

Sustainable development is becoming popular in the world for saving the earth. Utilizing resources judicially can save the earth's precious resources. Measurement of environmental components is the most effective step to conserve and protect natural resources.

Environmental auditing began in the early 1970s with the provision of civil lawsuits for non-compliance with environmental regulations. Environment auditing involves on-site visits, collection of samples, performing analyses, and reporting results to competent authorities.

Industry and the corporate world are initiating auditing for saving natural resources. Academic institutions also can contribute to the preservation and conservation of resources within their premises.

In this "Environment Audit" report would help everyone to think about preserving resources, show a willingness to learn their importance, adopt steps to minimize resource use, and set an example for others to follow the path of eco-friendly practices to achieve the goal of sustainable development. Effective implementation of environmental auditing helps in the minimization of environmental risks at a low cost.

OVERVIEW OF THE UNIVERSITY

Eternal University is NAAC Accredited & ISO 9001: 2015 Certified University established under the Himachal Pradesh Private University (Establishment & Regulation) Act 2006 & Himachal Pradesh Government Act. 3 of 2009, with the right to confer degree as per the UGC public notice on private Universities dated April 18, 2011.

The great visionary of the 20th century (Sant Attar Singh Ji) had a vision that modern scientific education alone will not serve humanity well, until and unless it is amalgamated with Braham Vidya (Spiritual Education). The graduates of this unique education system will not only be outstanding in academics, but also will have high moral values (i.e. they will have love for humanity, compassion for the weak and the underdog, and a sense of selfless service for the community). These graduates will work towards establishing permanent peace in the world. They will act as Ambassadors of Peace wherever they live, work, and raise their families.

Eternal University with its seven constituent colleges is unique in imparting value-based education to female students and is the first private university of Himachal Pradesh to start the College of Nursing, School of Public Health, and College of Agriculture. Among several previous recognitions, Eternal University has been recently recognized as “The 20th Best Higher Education Institution in India, 2019 which provides a broader perspective and cutting-edge higher education with a focal point on fostering skills and innovation” by EDUCATION BRAINIAC magazine.

In a largely residential campus the day-scholar girl students from nearby areas of Sirmaur district who could commute from home can now also pursue their studies in the Eternal University. This campus is situated in the Valley of Divine Peace, the Modern Gurukul provides the safest, drug and pollution-free environment with facilities such as a sports complex, gymnasium, NSS and NCC units, experimental farms, polyhouses, modern dairy complex, solar power utilization systems and support for holistic development of its students. The Eternal University has organized several conferences, workshops, camps and Kisan Melas with an emphasis on addressing the crucial problems of farmers of Sirmour and adjoining districts of Himachal Pradesh for their inclusive development.

The university offers 18 Bachelor programs, 28 Master Programmes, and 22 Doctorate Programmes.

Bachelor Programs

B.Sc. (Hons) Agriculture	B.Tech. Food Technology	B.Tech. CSE	B.Sc. Information Technology	B.Sc. Non-Medical
B.Sc. (Hon.) Mathematics	B.Sc. (Hons.) Microbiology	B.Sc. (Hons.) Economics	B. Ed	B.Com (Hons.)
B.B.A.	B.A. (Hons.) Music	B.A. Humanities	B.Sc. (Hons.) Psychology	B. Lib
	B.Sc. Medical	B.Tech. CSE Lateral/Migrated	*B.Sc. Nusring*	

Master Programs

M.Sc. Agronomy	M.Sc. Ag. Genetics & Plant Breeding	M.Sc. Ag. (Entomology)	M.Sc. Ag. (Horticulture) Vegetable Science	M.Sc. Ag. (Horticulture) Fruit Science
M.Sc. Ag. Horticulture (Floriculture & Landscape Architecture)	M.Sc. Ag. Plant Pathology	M.Sc. Agricultural Economics	M.Sc. Food Science & Technology	M.Tech. Food Technology
M.Tech. CSE	M.Sc. Botany	M.Sc. Chemistry	M.Sc. Mathematics	M.Sc. Microbiology
M.Sc. Physics	M.Sc. Zoology	M.P.H	M.Sc. Economics	M.Com.
Master of Business Administration	M.A. Music	M.A. (Hons.) Punjabi	M.Sc. Psychology	M.A. English
	M.A. Education	M.Sc. Biotechnology	M.Sc. Nusring	

Doctorate Programs

- Ph.D. Biotechnology
- Ph.D. Food Technology
- Ph.D. CSE
- Ph.D. Botany
- Ph.D. Chemistry
- Ph.D. Microbiology
- Ph.D. Mathematics
- Ph.D. Physics
- Ph.D. Zoology
- Ph.D. Economics
- Ph.D. Management
- Ph.D. English
- Ph.D. Music
- Ph.D. Public Health
- Ph.D. Horticulture(Veg Science)
- Ph.D. Agronomy
- Ph.D. Entomology
- Ph.D. Commerce
- Ph.D. Punjabi
- Ph.D. Genetics & Plant Breeding
- Ph.D. Nursing
- Ph.D. Psychology
- Ph.D. Education

Certificate Courses

- Geriatric Care Assistant
- Mental Health and Substance Abuse

Diploma Courses

- P.G. Diploma in Rehabitation Psychology (PGDRP)

Adon-Courses

- Library Science
- Career Guidance & Counselling

VISION | MISSION

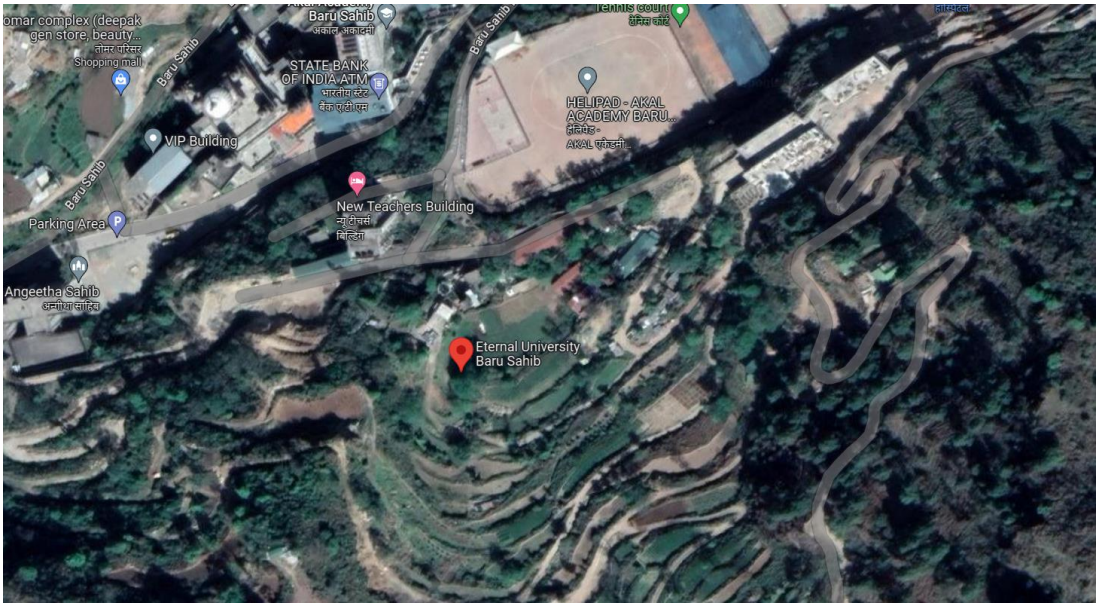
VISION

The relatively young Eternal University with its diverse programs, priorities, commitments, values, and efforts strives to emerge as a world-class women's university with its centre of excellence in science, technology, arts, and management. Major emphases will be focused on developing and strengthening industrial-institution linkages and harnessing the strength of its alumni for skill development, technology transfer, resource generation, and employment opportunities. Its graduates engrossed with holistic development, human values, professional ethics and skills, and entrepreneurship will adapt and earn comfortable livelihoods and serve mankind with love and devotion for its inclusive and sustainable development as our ambassadors of universal brotherhood for world peace."

MISSION

To transform and empower young women talent through cutting edge education in science, technology, arts and management amalgamated with spiritual rejuvenation for their holistic development to serve the mankind with compassion and love.

Geo Location



Geo Coordinates from Google maps: 30.753674, 77.296542

AUDIT PARTICIPANTS

On behalf of the University

Name	Designation
Prof. (Dr.) Davinder Singh	*Honorable Vice Chancellor*
Prof. (Dr.) Amrik Singh Ahluwalia	*Honorable Pro-Vice Chancellor*
Prof. (Dr.) B. S. Sohal	*Controller of Examination and Dean-PGS*
Prof. (Dr.) N. P. Singh	*Dean, Research*
Prof. (Dr.) Tusshar Mahajan	*Professor, Management Department*
Dr. S. K. Sharma	*Dean, Dr. K. S. Gill ACA*
Dr. B. D. Sharma	*Adjunct Professor, Botany*
Dr. Puneet Negi	*Assistant Professor and HoD, Physics*
Mr. B. S. Kapoor	*Accounts Officer*
Er. Rajeev Thakur	*Assistant Professor, CSE*
Mr. Sukhwinder Singh	*Transport Manager*
Er. Hemant Singh	*Electrical Engineer*
Mr. Santosh Sukla	*Solid Waste Management supervisor*
Mr. Manoj	*Wastewater treatment supervisor*

On behalf of EHS Alliance Services

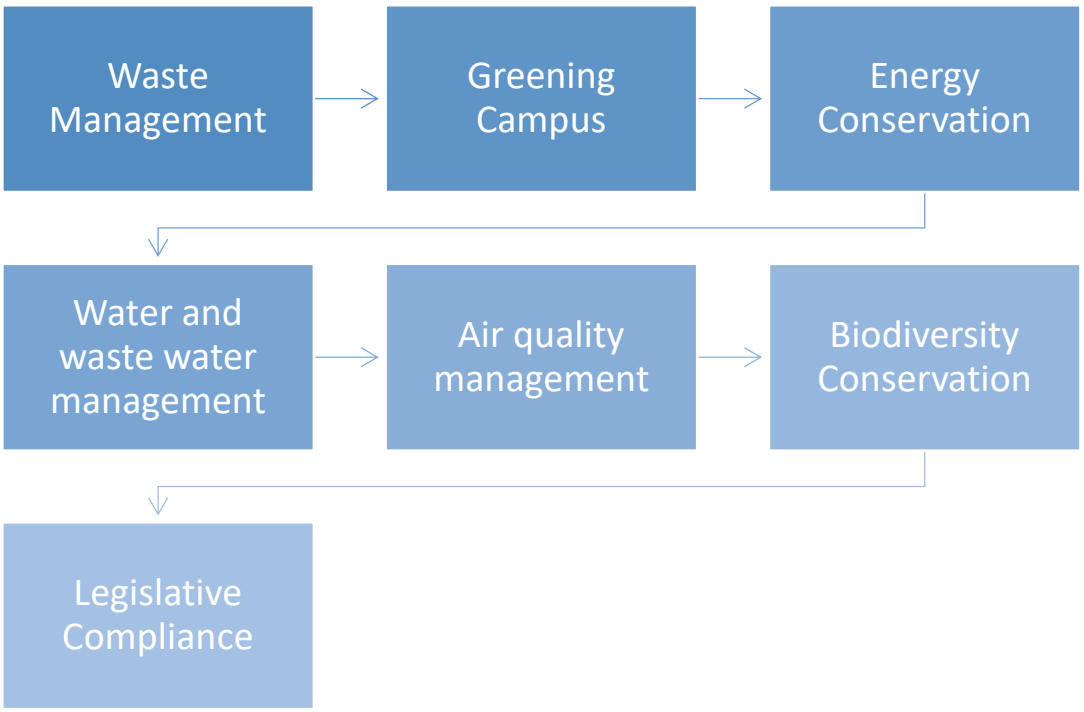
Name	Position	Qualifications
Dr. Uday Pratap	*Lead Auditor*	*Ph.D., PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Ms. Pooja Kaushik	*Co-Auditor*	*M.Sc., Field Expert, QCI – WASH*

EXECUTIVE SUMMARY

The environment 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. Our approach to promoting a Green Campus is to inculcate sustainable value systems among the students so that they carry the learning and practice them in their future endeavors. This will ensure that Sustainability and Environmental practices get embedded in all the institutions and organizations in the country.

A Green Campus is a place where environmentally friendly practices and education combine to promote sustainability in the campus which ultimately offers an institution the opportunity to take the lead in redefining its environmental culture and developing new paradigms by creating sustainable solutions to the environmental, social, and economic needs of the mankind.

This is the second consecutive environment audit of the University for doing its bit towards environmental protection and environmental awareness at local and global fronts. The 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 the audit. This audit report contains observations and recommendations for the improvement of environmental consciousness.



WASTE MANAGEMENT

TYPES OF WASTE ON UNIVERSITY CAMPUS

To create effective waste management plans, university first need to know the types of waste they produce. Below, we have compiled a list of various kinds of waste commonly generated on institutional campus:

1. **Food Waste** - University campus generates food waste. The average mess and canteen generate approximately 10 kg of food waste a day. The reasons for food waste on an educational campus may be over purchasing food to ensure a sufficient supply and then throwing it away, especially in all hostel messes where plentiful stores are essential. And in the cafeteria or hostel mess, students may pile food onto their ample trays, find it unappealing once they sit down and dutifully scrape it into the garbage. Immediate attention is given to the food waste minimization techniques.

2. **Recyclable Paper, Cardboard, Plastic, Glass and Cans** -Campus tends to produce vast quantities of these recyclables. Even in the digital age, many students, professors and staff members still prefer handwritten notes and end up with piles of unwanted paper once their courses and projects are complete. The snacks so essential to late-night studying or socializing tend to come in recyclable plastic, glass or aluminium containers. And shipments of necessary items throughout the year are likely to arrive in recyclable plastic and cardboard packaging. Quantitative analysis should be carried out to reduce waste in coming academic sessions.

3. **Student Clothes and Housewares** - As we have mentioned above, many students find it more convenient to throw away their clothes and dorm furnishings at the end of the year than donate or recycle them. The university should adopt a donation camp in the summer and winter seasons to help needy people.

4. **E – Waste - Student and facility electronics often form a large portion of a campus's waste** — As campus continually upgrade their computing facilities and office computers to keep up with the latest technology, the old computers have to go somewhere. So do old printers, phones, copy machines and other electronics that have received upgrades over the years. Discarded student electronics often become part of a university's waste stream as well. Students may throw away old phones, TVs, tablets, laptops, and printers, along with cords and other accessories. Recycling is a much more eco-friendly option — the metals in old electronics often have a high reuse value. University has tie-up with external authorized agencies details mentioned in legislation compliances.

5. **Chemical Waste -** Chemical waste on a university campus may come from numerous sources. Campus laboratories generate waste chemicals, as do cleaning services. The detergents used in campus laundry rooms eventually become waste as well. Much of these chemical substances are hazardous waste under the Manufacture, Storage and Import of

Hazardous Chemicals Rules, 1989 and must undergo specific disposal processes according to state environmental rules and regulations.

6. **Maintenance Waste -** In the maintenance department, spent paints, solvents, adhesives and lubricants all form potentially hazardous waste. Because they are difficult to recycle, spent incandescent light bulbs usually become landfill waste. Spent fluorescent light bulbs, which contain small amounts of mercury, typically require special handling because of the environmental and health risks they pose.

7. **Biological Waste -** Biological waste from laboratories and campus medical centres will require special handling and disposal as per BMW Rules, 2016. Tissue from biology and cadaver labs forms biological waste, as do tissue samples, contaminated bandages and used sharps from medical facilities.

8. **Furniture** - Furniture waste on a university campus has a couple different sources. The campus itself may also get rid of old furniture as it modernizes its classrooms, cafeterias, computer labs and study spaces. Annually sold to junk dealer.

9. **Books/Magazines/Newspapers -** Books accounted for solid waste generation and university often generate tons of textbook waste. As courses upgrade to new editions, they may end up throwing their newly obsolete textbooks into the garbage if donation programs cannot use them. Students, too, may find it more convenient merely to throw away their books at the end of the year rather than donating or reselling them.

10. **C & D Waste -** Due to expansion of university campus building and renovation works result significant amount of construction and demolition waste that should be either used for back filling or disposed-off through authorised dumping site by CPCB/SPCB.

11. **Municipal Solid Waste -** The University is managing solid waste by its own through waste treatment plant that has competent & trained personnel.

12. **Horticulture Waste** – University campus has lavished greenery and grounds that results significant horticulture waste which is managed by in-house composting system.

ENERGY CONSERVATION

1. **List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.**

   - *Electricity is saved by use of LED bulbs for illumination*
   - *LPG saves by use of Pressure cookers for cooking food.*
   - *Solar heaters usage in kitchens and hostels*
   - *200 kW Solar power plant installed, to save Grid electricity*

2. **Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some**

   Yes, Renewable source of energy through 200 KVA solar panel is operational

3. **How many CFL/LED bulbs has your institute installed?**

   80 % of Total Conventional bulbs and tube lights are replaced by LED/CFL Lights.

4. **Do you run "switch off" drills at institute?**

   Yes

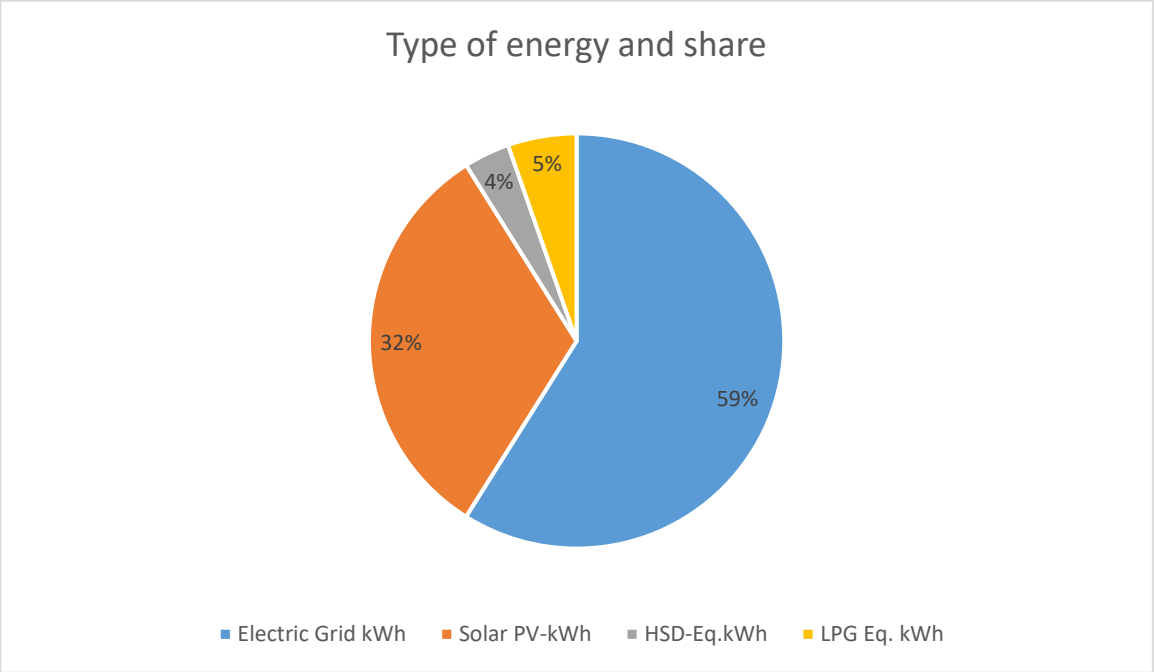
5. **Are your computers and other equipment's put on power-saving mode?**

   Yes, In Practice

6. **Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?**

   Yes, approx. 6 hours

Energy Share	kWh	Percentage
Electric Grid kWh	237776	58.94%
Solar PV-kWh	129652	32.14%
HSD-Eq. kWh	14400	3.57%
LPG Eq. kWh	21600	5.35%
Total -kWh	**403428**	**100%**



WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:

Drinking –34.44 KL/month

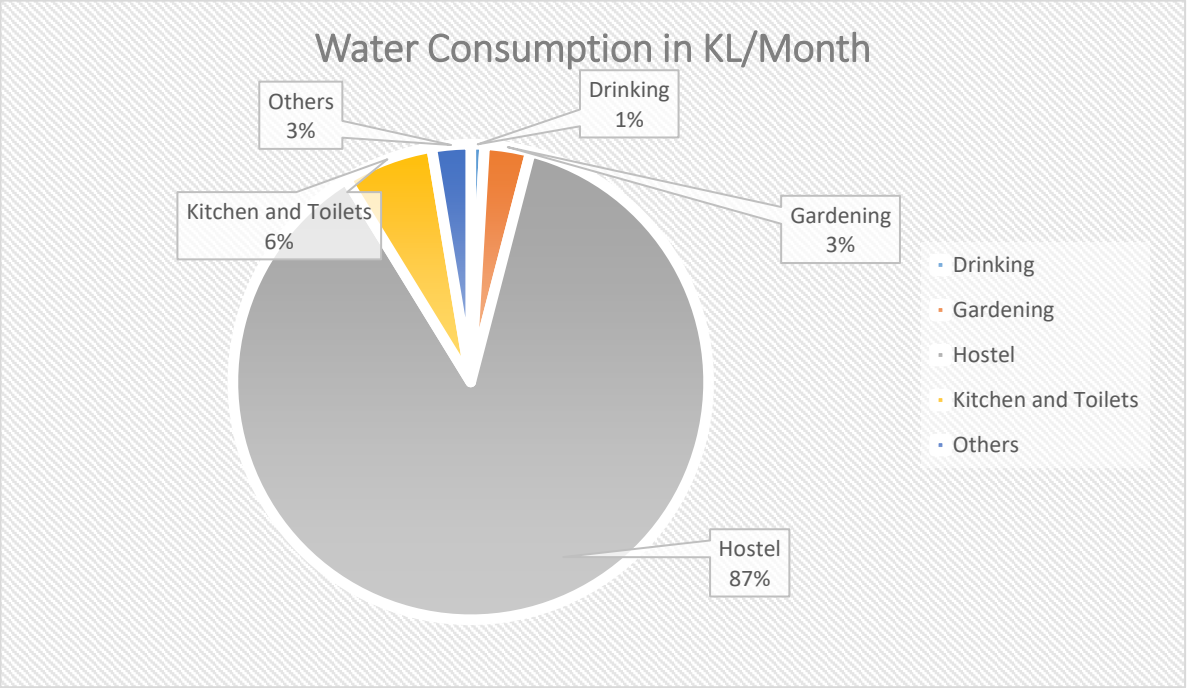
Gardening – 114.41 Kl/month (mostly STP Treated water is being used for gardening)

Kitchen and Toilets – 225.79 KL/month

Others – 96.94 KL/month

Hostel – 3210.30 KL/Month

Total = 3681.88 KL/Month



2. How does your institute store water? Are there any water saving techniques followed in your institute?

Storage: Water is stored in multiple water tanks situated on the roof of the building and then it is transferred to different areas of the university to fulfil the water requirement for different purposes.

Saving Techniques: Avoid overflow of water-controlled valves provided in the water supply system. Close supervision of the water supply system. Avoid overflow of water-controlled valves provided in the water supply system. Close supervision of the water supply system.

3. Locate the point of entry of water and point of exit of waste water in your institute. (Entry and Exit)

Point of Entry - Natural Spring Water

Point of Exit –

1. *From the Canteen, Toilets, and bathrooms by covered drainage which is connected to (1000 KLD) STP in the campus area.*
2. *From labs and medicals to STP (35 KLD) And, then, provided to Agriculture Farms.*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Maintenance and monitoring of valves in the supply system to avoid overflow, leakage, and spillage*
- *Water Conservation awareness for new students*
- *Initiate the installation of waterless urinals*

5. Does your institute harvest rainwater?

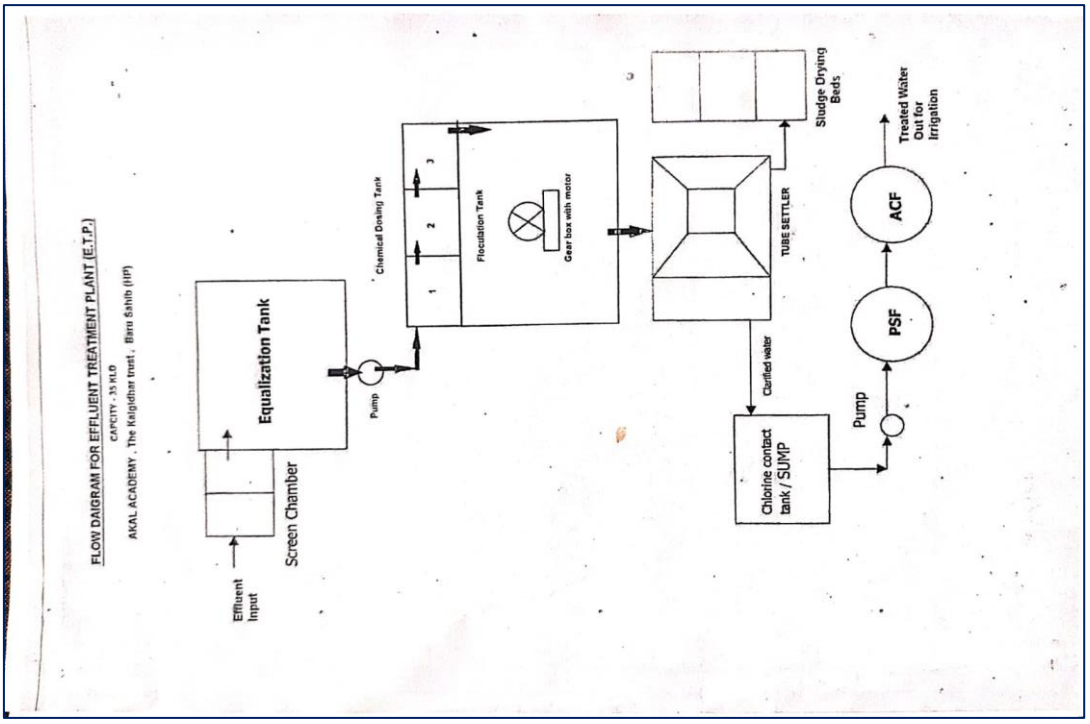
No

6. Is there any water recycling System?

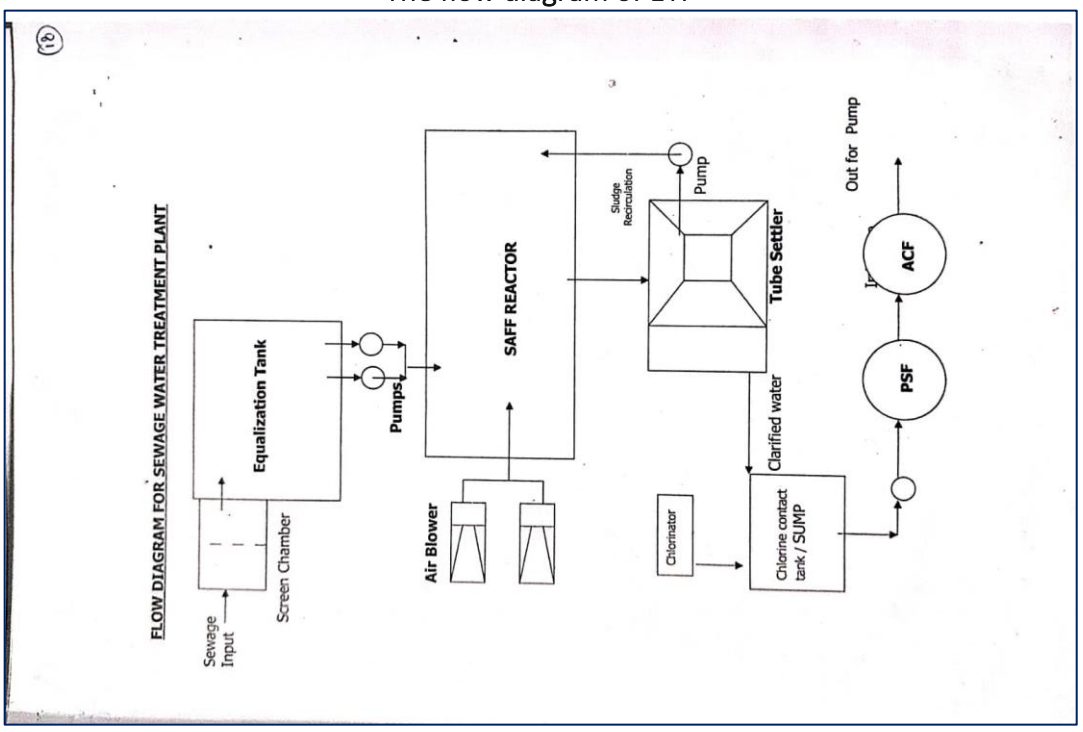
STP – 1000 KLD
ETP – 35 KLD

Zero liquid discharge (ZLD) is a strategic wastewater management system that ensures that there will be no discharge of industrial/hospital wastewater into the environment. It is achieved by treating wastewater through recycling and then recovery and reuse for flushing, gardening, DG cooling, and housekeeping purposes. 1000 KLD STP and 35 KLD ETP are for hospitals installed and functional on Campus as per Environment Clearance from State Pollution Control Board dated.

Below are the flowchart diagrams for the ETP and STP plant in Eternal University.



The flow diagram of ETP



The flow diagram of STP

AIR QUALITY MANAGEMENT

1. Are the Rooms on Campus Well Ventilated?

Yes, as per the National Building Code, guidelines

2. Window Floor ratio of the Rooms?

Very Good, ample daylight utilization

3. What is the ownership of the vehicles used by your campus?

University and Personal owned vehicles only

4. Provide details of university-owned vehicles.

Details of the vehicles are as follows
Bus – 4
Cars – 2
Vans – 2
Others – 1
Electric -2
Total – 11

5. PUC done?

Yes

6. Specify the type of fuel used by your campus's vehicles

Vehicles use diesel, petrol, and electricity on the campus.

7. Air Quality Monitoring Program (If, Any)

Yes, with university equipment.

ENVIRONMENT LEGISLATIVE COMPLIANCE

1. **Are you aware of any environmental Laws Pertaining to different aspects of environmental management?**

Yes, faculty members and the administrative team are well aware of national environmental laws.

2. **Does your institute have any rules to protect the environment? List possible rules you could include.**

Yes, innovative initiatives are being taken by the campus to reduce pollution and go green.

3. **Does Environmental Ambient Air Quality Monitoring conducted by the Institute?**

Yes

4. **Is environmental Water and Wastewater Quality monitoring conducted by the Institute?**

Yes

5. **Is stack monitoring of DG sets conducted by the Institute?**

Yes, by an approved Laboratory.

6. **Is any warning notice, or letter issued by state government bodies?**

No

7. **Is any Hazardous waste generated by the Institute?**

Yes, BMW is managed by incinerators and ETP

GENERAL INFORMATION

1. Does your institute have any rules to protect the environment? List possible rules you could include.

Yes, the SDG committee takes decisions for environmental protection in campus, for example – the reuse of waste plastic into bricks and pots, making file covers from used papers, etc.

2. Are students and faculties aware of environmental cleanliness ways? If Yes Explain

Yes, periodic pollution reduction, plantation, and energy conservation awareness campaigns carried out by the institute

3. Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?

Yes, Earth Day, Ozone Day, World Environment Day, and more are celebrated by campus.

4. Does the Institute participate in National and Local Environmental Protection Movement?

Yes, Swatch Bharat Abhiyan by students at campus

5. Does Institute have any Recognition or certification for environment friendliness?

Yes, Earth Day, Ozone Day, World Environment Day, and more are celebrated by campus.

6. Does Institute participate in National and Local Environmental Protection Movement?

Yes, for e waste management recognition certificate (copy attached)

7. Does the Institution conduct a green or environmental audit of its campus?

This is the second external audit carried out by the university.

8. Has the institution been audited /accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?

Yes, periodically audited by such agencies for continual improvement. (Please provide certificates of NABL)

RECOMMENDATIONS

- Green building guidelines with ECBC compliance should be adopted for future expansion projects/ buildings of the university.
- Provide sanitary waste disposal facility as per the CPCB guidelines for management of sanitary waste (as per Solid Waste Management Rules, 2016). Periodical inspection & scheduled maintenance is recommended for previously installed Incinerator in the university campus.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Stack Monitoring of DG sets, Water monitoring need to be conducted by State Pollution Control Committee, approved laboratory)
- An environmental policy document should be displayed in campus with all the recommendations and current practice carried by Eternal University.
- Environmental parameters should be included in purchase policy to achieve cradle to grave approach for sustainability.

CONCLUSION

This audit involved extensive consultation with all the campus team and interactions with key personnel on a wide range of issues related to environmental aspects. Overall, 80% of the university campus is for landscaping. The audit has identified some observations for making the campus premises more environmentally friendly. The recommendations are also mentioned with observations for the university campus team to initiate actions. The audit team opines that the overall site is well-maintained from an environmental perspective. Still, there are a few things that are important to initiate urgently which include the installation of the incinerator, air quality monitoring, and periodic inspection of buildings to increase energy efficiency.

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 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**

ANNEXURE PHOTOGRAPHS – WASTE MANAGEMENT AND RECYCLING

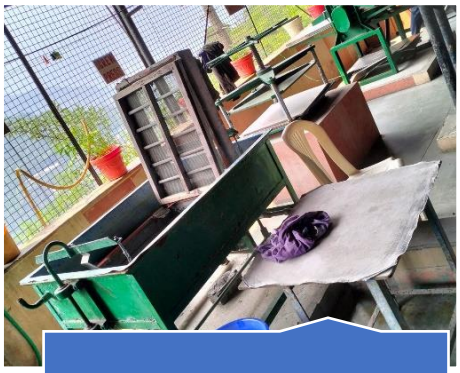
Plastic Waste Recycling to Flower Pots

Plastic Waste recycling to Sand Bricks

Waste Categorization and Recycling

Vermi Coposting in Campus

Colour Coded Dust Bins in Campus



Paper Waste Recycling

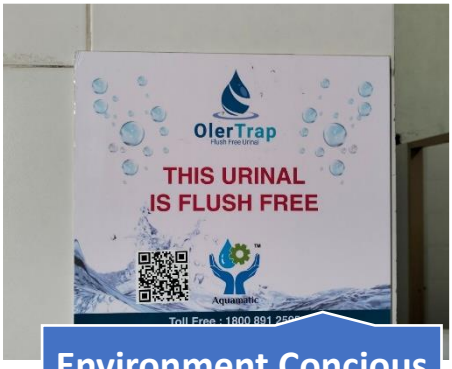
Solar PV

Solar Heaters

Composter machine

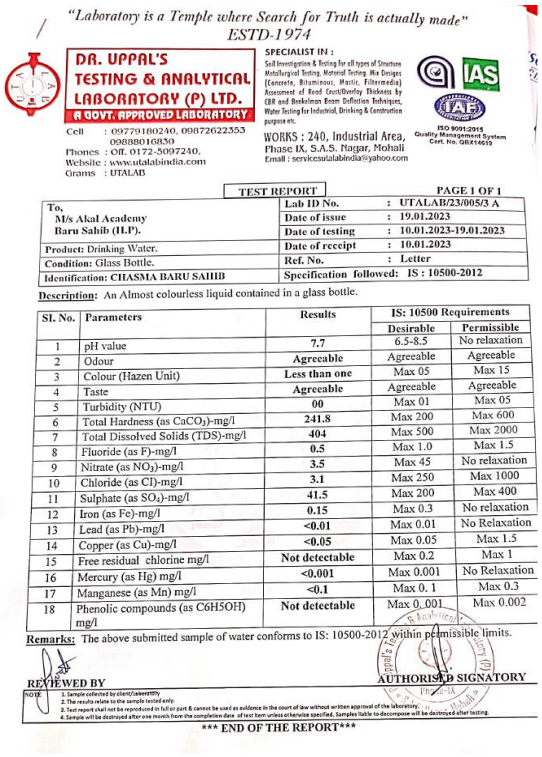
5 Star appliances

Electric vehicle in campus



Environment Concious Posters on Campus

MOU FOR E-WASTE MANAGEMENT



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ISO 9001:2015 Quality Management System Cert. No. QRX14619

TEST REPORT PAGE 1 OF 1

To, M/s Akal Academy Baru Sahib (H.P).	Lab ID No.	: UTALAB/23/005/3 A
	Date of issue	: 19.01.2023
	Date of testing	: 10.01.2023-19.01.2023
Product: Drinking Water.	Date of receipt	: 10.01.2023
Condition: Glass Bottle.	Ref. No.	: Letter
Identification: CHASMA BARU SAHIB	Specification followed:	IS : 10500-2012

Description: An Almost colourless liquid contained in a glass bottle.

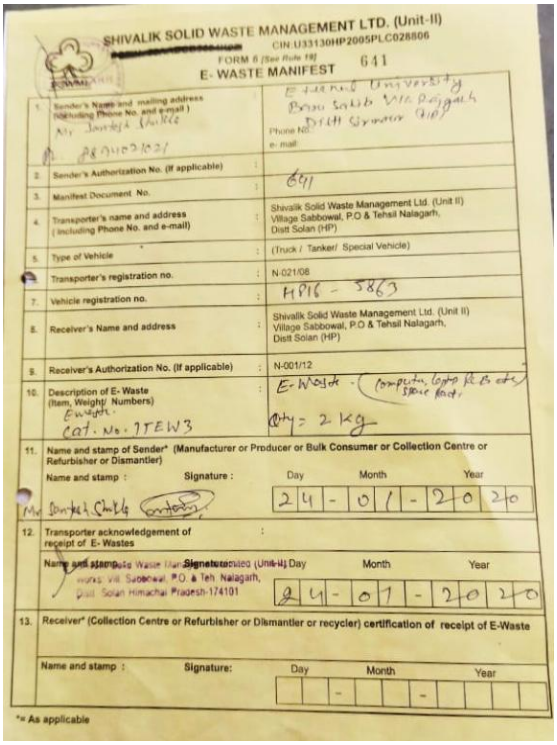
Sl. No.	Parameters	Results	IS: 10500 Requirements	
			Desirable	Permissible
1	pH value	7.7	6.5-8.5	No relaxation
2	Odour	Agreeable	Agreeable	Agreeable
3	Colour (Hazen Unit)	Less than one	Max 05	Max 15
4	Taste	Agreeable	Agreeable	Agreeable
5	Turbidity (NTU)	00	Max 01	Max 05
6	Total Hardness (as $CaCO_3$)-mg/l	241.8	Max 200	Max 600
7	Total Dissolved Solids (TDS)-mg/l	404	Max 500	Max 2000
8	Fluoride (as F)-mg/l	0.5	Max 1.0	Max 1.5
9	Nitrate (as NO_3)-mg/l	3.5	Max 45	No relaxation
10	Chloride (as Cl)-mg/l	3.1	Max 250	Max 1000
11	Sulphate (as SO_4)-mg/l	41.5	Max 200	Max 400
12	Iron (as Fe)-mg/l	0.15	Max 0.3	No relaxation
13	Lead (as Pb)-mg/l	<0.01	Max 0.01	No Relaxation
14	Copper (as Cu)-mg/l	<0.05	Max 0.05	Max 1.5
15	Free residual chlorine mg/l	Not detectable	Max 0.2	Max 1
16	Mercury (as Hg) mg/l	<0.001	Max 0.001	No Relaxation
17	Manganese (as Mn) mg/l	<0.1	Max 0. 1	Max 0.3
18	Phenolic compounds (as C6H5OH) mg/l	Not detectable	Max 0. 001	Max 0.002

Remarks: The above submitted sample of water conforms to IS: 10500-2012 within permissible limits.

REVIEWED BY AUTHORISED SIGNATORY

NOTE: 1. Sample collected by client/Laboratory. 2. The results relate to the sample tested only. 3. Test report shall not be reproduced in full or part & cannot be used as evidence in the court of law without written approval of the laboratory. 4. Sample will be destroyed after one month from the completion date of test form unless otherwise specified. Samples liable to decompose will be destroyed after testing.

*** END OF THE REPORT***



SHIVALIK SOLID WASTE MANAGEMENT LTD. (Unit-II)
CIN:U33130HP2005PLC028806
FORM 6 (See Rule 19)
E- WASTE MANIFEST 641

1.	Sender's Name and mailing address (including Phone No. and e-mail)	Eternal University Baru Sahib Vill Paigarh Distt Sirmaur (HP) Phone No: e-mail:
2.	Sender's Authorization No. (If applicable)	
3.	Manifest Document No.	641
4.	Transporter's name and address (including Phone No. and e-mail)	Shivalik Solid Waste Management Ltd. (Unit II) Village Sabbowal, P.O & Tehsil Nalagarh, Distt Solan (HP)
5.	Type of Vehicle	(Truck / Tanker/ Special Vehicle)
6.	Transporter's registration no.	N-021/08
7.	Vehicle registration no.	HP16 - 5863
8.	Receiver's Name and address	Shivalik Solid Waste Management Ltd. (Unit II) Village Sabbowal, P.O & Tehsil Nalagarh, Distt Solan (HP)
9.	Receiver's Authorization No. (If applicable)	N-001/12
10.	Description of E- Waste (Item, Weight/ Numbers)	E-Waste - (computer, Laptop, PC & other Store items) Qty = 2 Kg

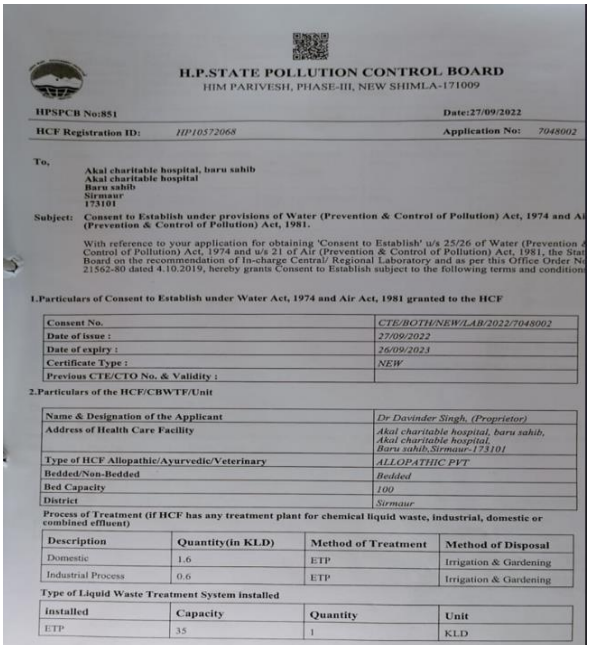
11. Name and stamp of Sender* (Manufacturer or Producer or Bulk Consumer or Collection Centre or Refurbisher or Dismantler)
Name and stamp : Signature : Day 24 Month 01 Year 2020

12. Transporter acknowledgement of receipt of E- Wastes
Name and stamp : Signature : Day 24 Month 01 Year 2020

13. Receiver* (Collection Centre or Refurbisher or Dismantler or recycler) certification of receipt of E-Waste
Name and stamp : Signature: Day Month Year

*= As applicable

Bio-Hazardous Waste Management System/ MoU



H.P.STATE POLLUTION CONTROL BOARD
HIM PARIVESH, PHASE-III, NEW SHIMLA-171009

HPSPCB No:851 Date:27/09/2022
HCF Registration ID: HP10572068 Application No: 7048002

To,
Akal charitable hospital, baru sahib
Akal charitable hospital
Baru sahib
Sirmaur
173101

Subject: Consent to Establish under provisions of Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981.

With reference to your application for obtaining 'Consent to Establish' u/s 25/26 of Water (Prevention & Control of Pollution) Act, 1974 and u/s 21 of Air (Prevention & Control of Pollution) Act, 1981, the State Board on the recommendation of In-charge Central/ Regional Laboratory and as per this Office Order No. 21562-80 dated 4.10.2019, hereby grants Consent to Establish subject to the following terms and conditions

1.Particulars of Consent to Establish under Water Act, 1974 and Air Act, 1981 granted to the HCF

Consent No.	CTE/BOTH/NEW/LAB/2022/7048002
Date of issue :	27/09/2022
Date of expiry :	26/09/2023
Certificate Type :	NEW
Previous CTE/CTO No. & Validity :	

2.Particulars of the HCF/CBWTF/Unit

Name & Designation of the Applicant	Dr Davinder Singh, (Proprietor)
Address of Health Care Facility	Akal charitable hospital, baru sahib, Akal charitable hospital, Baru sahib,Sirmaur-173101
Type of HCF Allopathic/Ayurvedic/Veterinary	ALLOPATHIC PVT
Bedded/Non-Bedded	Bedded
Bed Capacity	100
District	Sirmaur

Process of Treatment (if HCF has any treatment plant for chemical liquid waste, industrial, domestic or combined effluent)

Description	Quantity(in KLD)	Method of Treatment	Method of Disposal
Domestic	1.6	ETP	Irrigation & Gardening
Industrial Process	0.6	ETP	Irrigation & Gardening

Type of Liquid Waste Treatment System installed

installed	Capacity	Quantity	Unit
ETP	35	1	KLD

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

ETERNAL UNIVERSITY

BARU SAHIB, DISTT SIRMAUR, NEAR RAJGARH,
HIMACHAL PRADESH 173101

ENERGY AUDIT REPORT

PREPARED BY
EHS ALLIANCE SERVICES

CONTENTS

CERTIFICATE

ACKNOWLEDGEMENT

EHS Alliance Services Audit Team thanks the management of Eternal University for assigning this important work of Energy Audit of the university. We appreciate the co-operation to our team for completion of study.

Our special thanks are due to

Dr. Narinder Pal Singh, Dean Research (Volunteering)

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

DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Eternal University based on input data submitted by the representatives of university complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Vijay Singh
Lead Auditor EMS & Energy

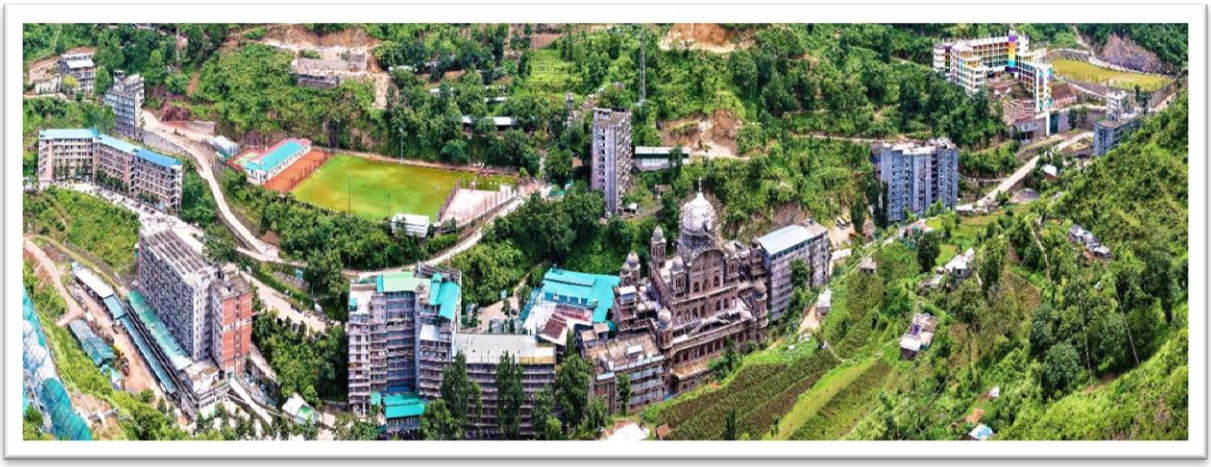
Dr. Uday Pratap
Co-Auditor EMS & Energy

ABBREVIATION

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

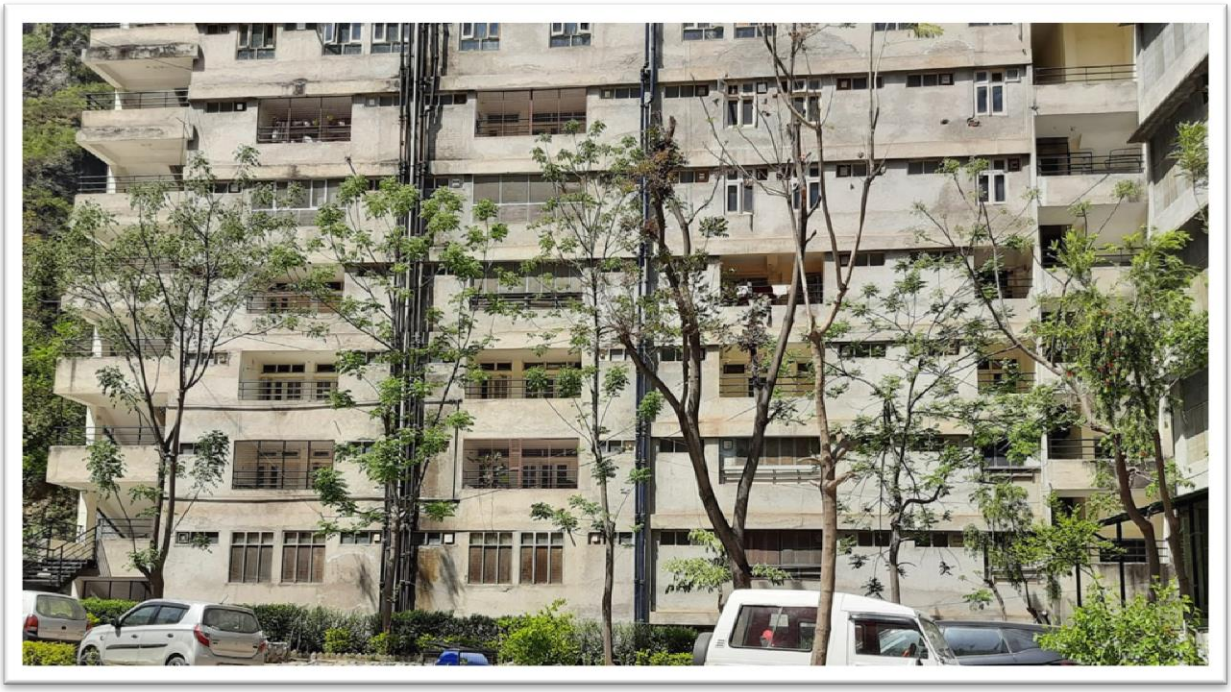
INTRODUCTION OF UNIVERSITY

Eternal university is NAAC Accredited & ISO 9001: 2015 Certified University established under the Himachal Pradesh Private University (Establishment & Regulation) Act 2006 & Himachal Pradesh Government Act.no. 3 of 2009, with the right to confer degree as per the UGC public notice on private Universities dated April 18, 2011.



The great visionary of 20th century (Sant Attar Singh Ji) had a vision that modern scientific education alone will not serve the humanity well, until and unless it is amalgamated with Braham Vidya (Spiritual Education). The graduates of this unique education system will not only be outstanding in academics, but also will have high moral values (i.e. they will have love for humanity, compassion for the weak and the underdog, and sense of selfless service for the community). These graduates will work towards establishing permanent peace in the world. They will act as Ambassadors of Peace wherever they live, work and raise their families.

Eternal University with its seven constituent colleges is unique in imparting value based education to girl students and is the first private university of Himachal Pradesh to start College of Nursing, School of Public Health and College of Agriculture. Among several previous recognitions the Eternal University has been recently recognized as "The 20th Best Higher Education Institution in India, 2019 which are providing a broader perspective and cutting edge higher education with a focal point on fostering skills and innovation" by EDUCATION BRAINIAC magazine.



In a largely residential campus the day-scholar girl students from nearby areas of Sirmaur district who could commute from home can now also pursue their studies in the Eternal University. Situated in the Valley of Divine Peace the Modern Gurukul is providing safest, drug and pollution free environment with facilities such as sports complex, gymnasium, NSS and NCC units, experimental farms, poly houses, modern dairy complex, solar power utilization systems and support for holistic development of its students. The Eternal University has organized several conferences, workshops, camps and Kisan Melas with emphasis to address the crucial problems of farmers of Sirmour and adjoining districts of Himachal Pradesh for their inclusive development.

University offers 17 Bachelor programmes, 27 Master Programmes and 19 Doctorate Programmes.

Bachelors Programme		
B.Sc. (Hons) Agriculture B.Tech. Food Technology B.Tech. CSE	B.Sc. (Hon.) Mathematics B.Sc. (Hons.) Microbiology	B.B.A. B.A. (Hons.) Music B.A. Humanities B.Sc. (Hons.) Psychology

B.Sc. Information Technology B.Sc. Non-Medical	B.Sc. (Hons.) Economics B. Ed B.Com (Hons.)	B. Lib B.Sc. Medical B.Tech. CSE Lateral/Migrated
Masters Programme		
M.Sc. Biotechnology M.Sc. Agronomy M.Sc. Ag. Genetics & Plant Breeding M.Sc. Ag. (Entomology) M.Sc. Ag. (Horticulture) Vegetable Science M.Sc. Ag. (Horticulture) Fruit Science M.Sc. Ag. Horticulture (Floriculture & Landscape Architecture)	M.Sc. Ag. Plant Pathology M.Sc. Agricultural Economics Technology M.Tech. CSE M.Sc. Botany M.Sc. Chemistry M.Sc. Mathematics M.Sc. Microbiology M.Sc. Physics M.Sc. Zoology M.P.H	M.Sc. Food Science & Technology M.Tech. Food M.Sc. Economics M.Com. Master of Business Administration M.A. Music M.A. (Hons.) Punjabi M.Sc. Psychology M.A. English M.A. Education
Doctorate Programme		
Ph.D. Biotechnology Ph.D. Food Technology Ph.D. CSE Ph.D. Botany Ph.D. Chemistry Ph.D. Microbiology Ph.D. Mathematics	Ph.D. Physics Ph.D. Zoology Ph.D. Economics Ph.D. Management Ph.D. English Ph.D. Music Ph.D. Commerce	Ph.D. Public Health Ph.D. Horticulture(Veg Science) Ph.D. Agronomy Ph.D. Entomology Ph.D. Punjabi

The University has drawn its Vision and Mission which has been defined keeping in view the objectives of the University.

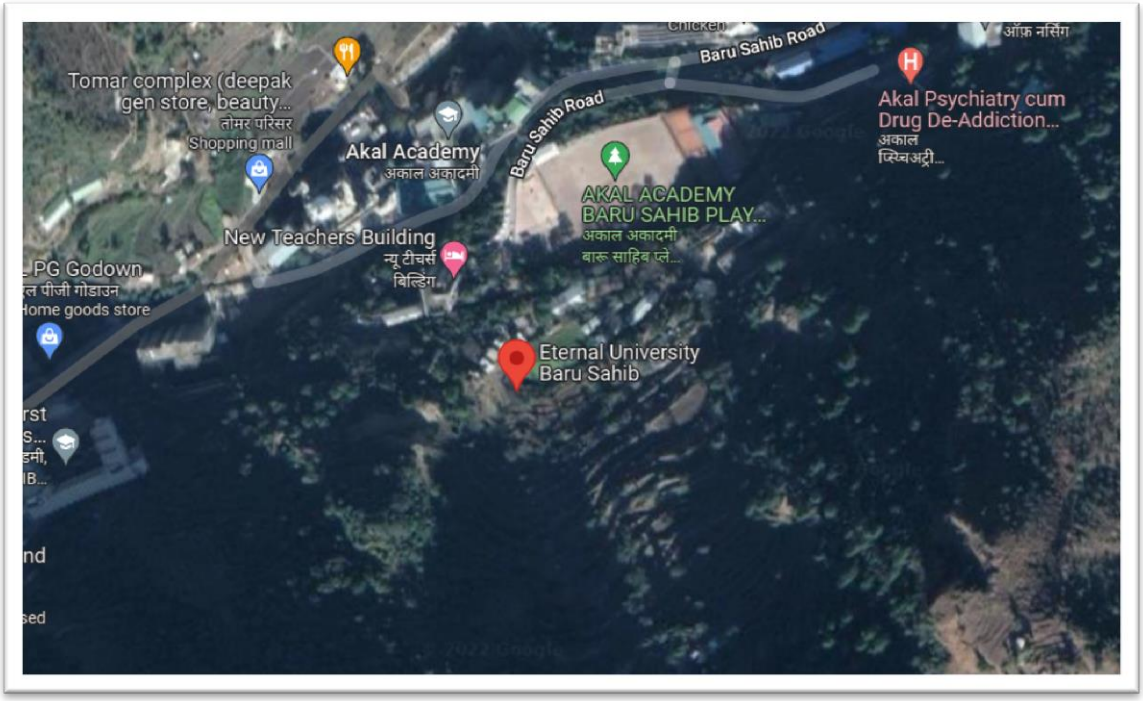
MISSION

"To transform and empower young women talent through cutting edge education in science, technology, arts and management amalgamated with spiritual rejuvenation for their holistic development to serve the mankind with compassion and love."

VISION

"The relatively young Eternal University with its diverse programmes, priorities, commitments, values and efforts strives to emerge as a world-class women university with its centers of excellence in science, technology, arts and management. Major emphases will be focused on developing and strengthening industrial-institution linkages and harnessing strength of its alumni for skill development, technology transfer, resources generation and employment opportunities. Its graduates engrossed with holistic development, human values, professional ethics and skills and entrepreneurship will adapt and earn confortable livelihood and serve the mankind with love and devotion for its inclusive and sustainable development as our ambassadors of universal brotherhood for world peace."

Google Map – Satellite View of Campus



Geo-tagging Coordinates: 30.753674, 77.296542

Audit Participants

On behalf of University

Name & Designation
Dr. Narinder Pal Singh ***– Dean Research***
Dr. B. S. Sohal - ***Dean PGS***
Dr. A. S. Ahluwalia ***– Pro Vice Chancellor***
Mr. Santosh Shukla – ***In-charge AHKS***

On behalf of EHS Alliance Services

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

EXECUTUVE SUMMARY

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

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

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

ENERGY AUDIT ANALYSIS

1. ENERGY CONSUMPTION

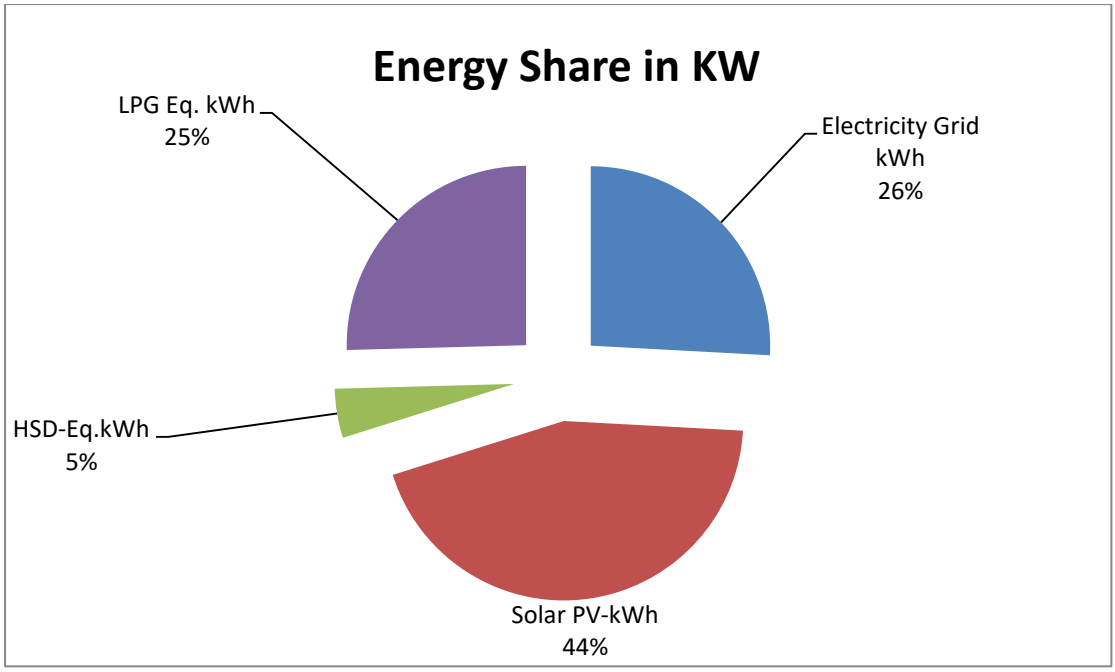
1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

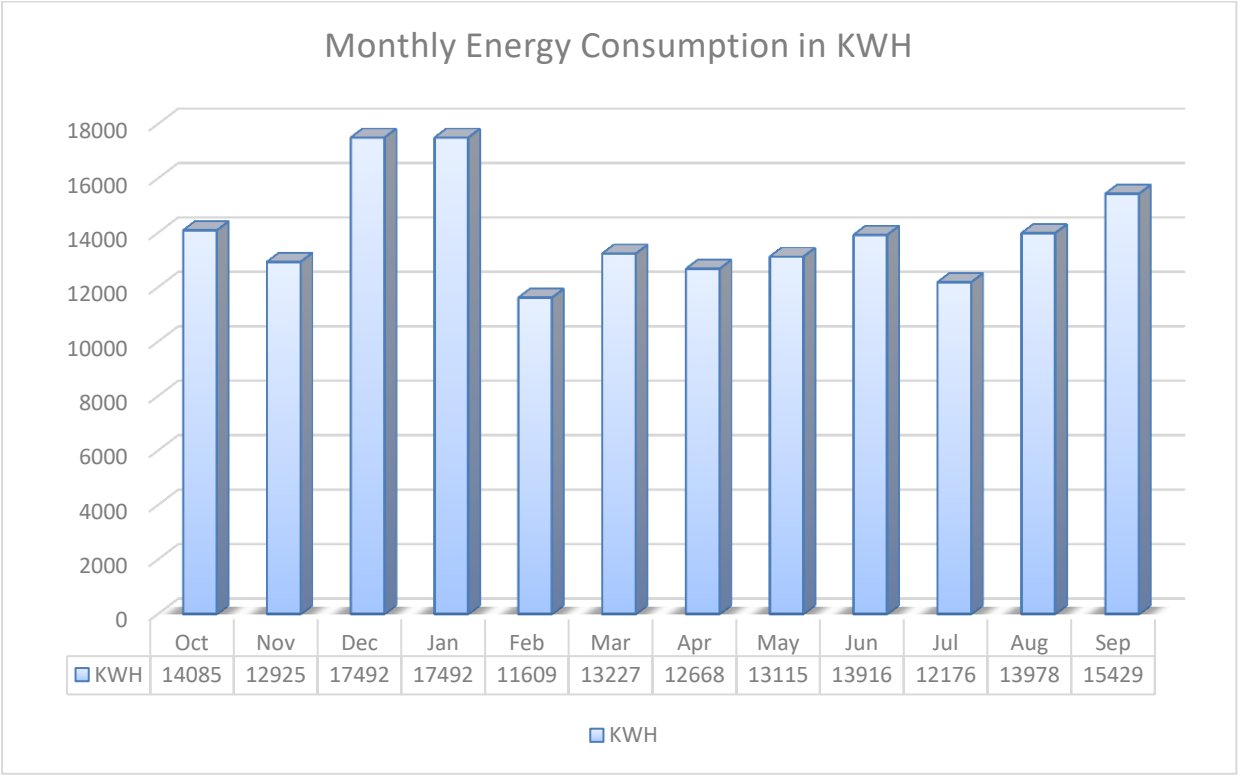
To understand the Energy consumption trend and for developing the baseline parameter we have collected monthly energy bill for the 12 months i.e. from October 2020 to September 2021.

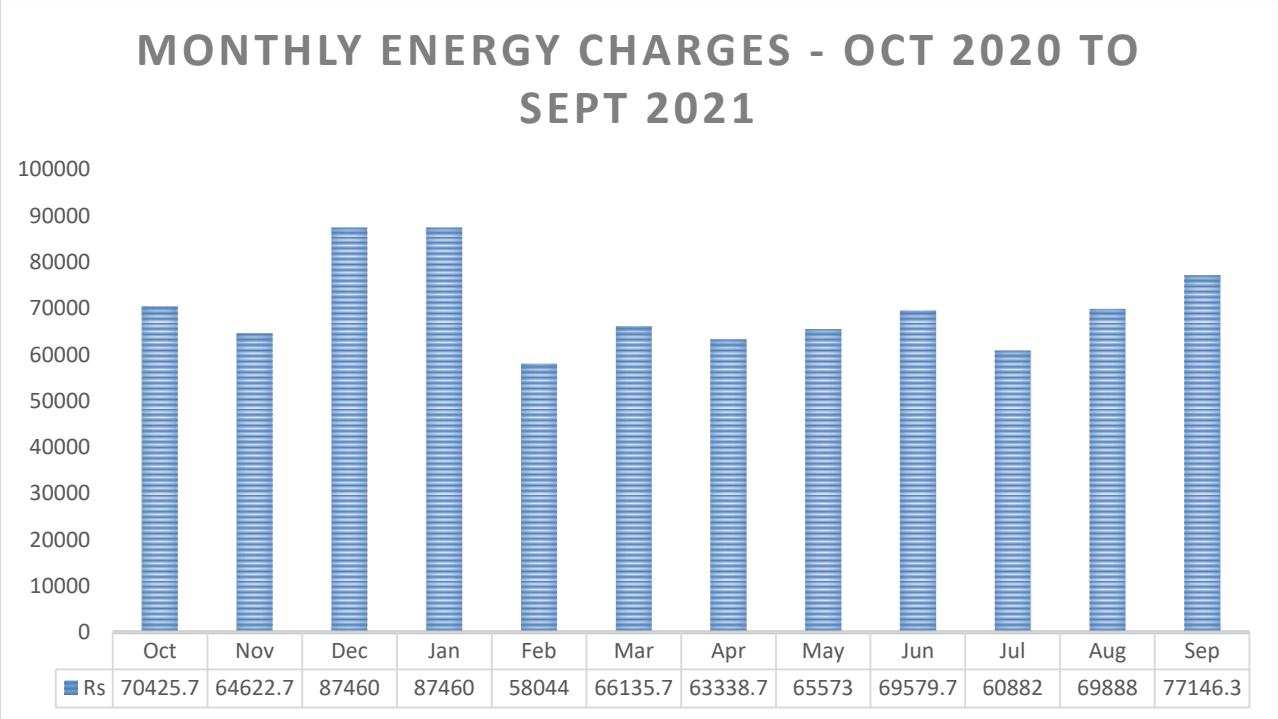
Duration 2020-2021	Total Units of the Campus (kWH)	Units consumed by Eternal University (kWH)	Total Amount (INR) of the Campus	Amount (INR) of the Eternal University
Oct	42255	14085	211277.00	70425.67
Nov	38774	12925	193868.00	64622.67
Dec	52476	17492	262380.00	87460.00
Jan	52476	17492	262380.00	87460.00
Feb	34826	11609	174132.00	58044.00
Mar	39681	13227	198407.00	66135.67
Apr	38003	12668	190016.00	63338.67
May	39344	13115	196719.00	65573.00
Jun	41748	13916	208739.00	69579.67
Jul	36529	12176	182646.00	60882.00
Aug	41933	13978	209664.00	69888.00
Sep	46288	15429	231439.00	77146.33
Total	**504333**	**168112**	**2521667.00**	**840555.67**

1.2 Overall annual energy consumption and energy sources

Energy Share	kWh	Percentage
Electricity Grid kWh	168,111.07	25.85%
Solar PV-kWh	288,000.00	44.29%
HSD-Eq. kWh	28,811.36	4.43%
LPG Eq. kWh	165,325.49	25.42%
Total -kWh	**650,247.91**	**100%**


Energy Share in KW
LPG Eq. kWh
25%
Electricity Grid
kWh
26%
HSD-Eq.kWh
5%
Solar PV-kWh
44%

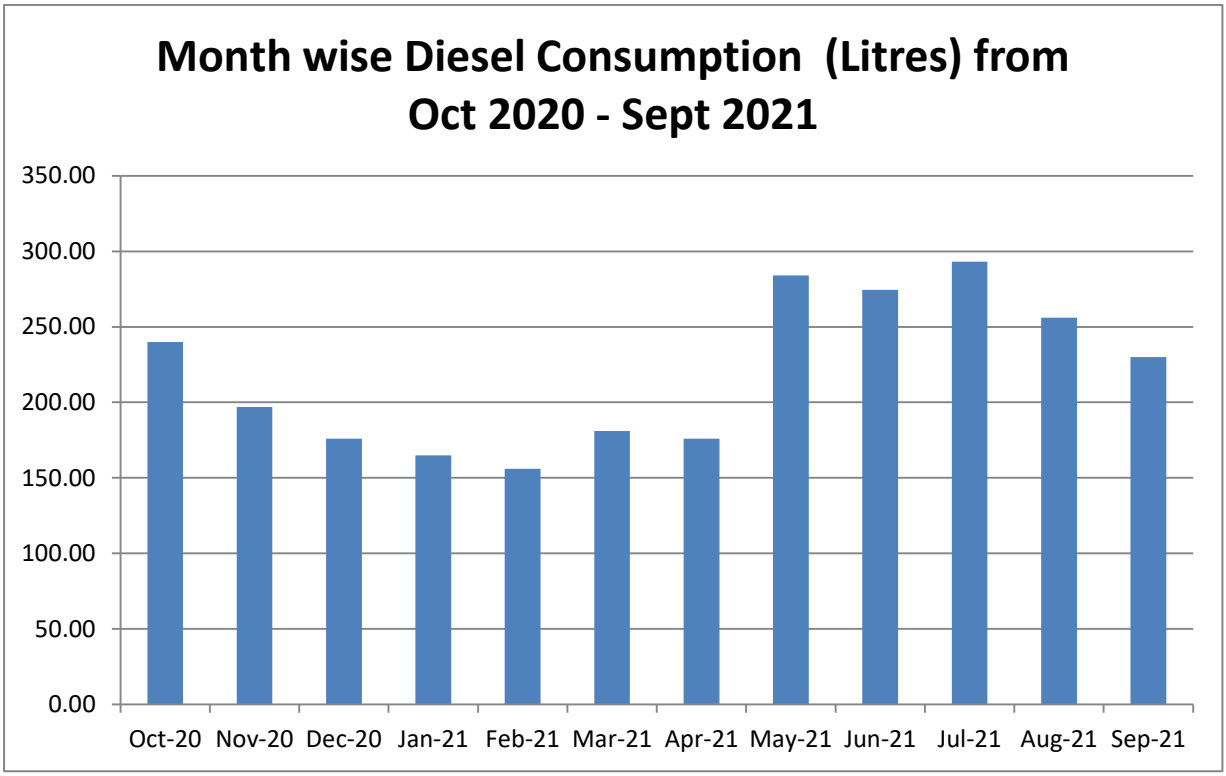

Monthly Energy Consumption in KWH
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
KWH 14085 12925 17492 17492 11609 13227 12668 13115 13916 12176 13978 15429
KWH



2. DIESEL CONSUMPTION

Below is the diesel consumption detail in litres from October 2020 to September 2021.

Month wise Diesel Consumption (Litres) of one year	
Period	**Diesel Consumption (Litres)**
Oct-20	240.00
Nov-20	197.00
Dec-20	176.00
Jan-21	165.00
Feb-21	156.00
Mar-21	181.00
Apr-21	176.00
May-21	284.00
Jun-21	274.54
Jul-21	293.23
Aug-21	256.00
Sep-21	230.00
Total	**2628.77**



3. ANALYSIS OF DG SETS

In the university, there is one Diesel Generator (DG) sets for its electrical power needs in case of Grid power failure. Total installed DG sets capacity is 250 kVA.

DG Set Performance		
Description	**Unit**	**DG at Station 1**
Design details:		
Description	Unit	DG
Rated capacity	kVA	250
Hz	Hz	50
Volts	Volts	415
PF	PF	0.8
Phase	Phase	3
RPM	RPM	1500

Operating details:	Hours	8
Operating hours during testing	Hours	0.50
Operational details:		
Operating hours during testing	Hours	0.50
% Loading	%	67.51
Energy Generation	kWh	33.35
Load	KVA	84.4
Fuel consumption during testing	Litre	10.80
Specific energy generation	kWh/litre	3.09

Observation and Suggestions:- As per the trial taken during the energy audit the percentage loading of DG set is 67.51% which is ok and specific energy consumption of DG Sets 3.09 KWH/Litre which is satisfactory because as per manufacturer recommendation, best practices for SEC in DG sets range from 3.0 to 3.5 kWh/litre and above.

4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's 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 as air-conditioning tonnage.

There are Split ACs installed in Eternal University in various areas of various capacity which detail is given below:-

S. No.	Type of AC	Rated capacity (TR)	Room Temp. (°C)	AC-Tout (°C)	AC-Tin (°C)	Room-RH (%)	Area (m2)	Air velocity (m/s)	Enthalpy Hout	Enthalpy Hin	Heat Load in TR	KW supplied	(Eff.)Power per Ton (KW/TON)	EER
1	Split-1	1.5	24	11	20	52	0.03	2.2	22	38	0.39	0.63	1.61	2.18
2	Split-2	1.5	24	12	20	52	0.03	2.2	25	38	0.32	0.55	1.72	2.04
3	Split-3	1.5	24	11	19	52	0.03	2.6	24	37	0.38	0.57	1.52	2.31
4	Split-4	1.5	24	10	18	52	0.03	2.4	24	37	0.35	0.53	1.53	2.3

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

5. CEILLING FANS ANALYSIS

In the university, 462 nos. Ceiling Fans are installed and observation and suggestion are given below.

S.No.	Location/Identification	Ceiling Fan-70W/80W
1	Ground Floor	39
2	First Floor	90
3	Second Floor	78
4	Third Floor	75
5	Fourth Floor	85
6	Fifth Floor	95
	Total Count	**462**

Observation and Suggestions:-

In the university, old ceiling fans of 70/80 W are installed but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. Therefore we suggest to replace BEE 5 Star rated fans of 30W.

ECRM-1-Energy saving by replacing 70/80 W fans with energy efficient 30W ceiling fans

Total no of Ceiling Fans (70/80W)		462	Nos.
Total wattage of 60W Ceiling Fans		32340	Watt
Total wattage of BEE 5 Star rated Fans (30W)		13860	Watt
Total saving in Wattage after replacement		18480	Watt
Operating hours per day		8	Hours
Operating days per annum		220	Days
Energy charges per unit in Rs.		5	INR
Saving in Rs./annum		162624	INR
Investment INR		1386000	INR
Payback period:- Months		**8.52**	YEARS

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

6. ANALYSIS OF LIGHTING SYSTEM

6.1 Brief description of existing system

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

6.2 Inventory of Lighting

S.No.	Location/Identification	18W LED Light	36W LED	50W LED Flood
1	University Computer center		261	7
2	Teaching Blocks	270	170	6

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

University have efficient lighting solution. LEDs saves energy, the life span is much greater and emit virtually no heat. We recommend to install the sensor based lights for common areas like corridors, washrooms, library, canteen, common rooms, faculty rooms, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc.

Table below shows the performance characteristics comparison of all luminaries.

Table 8.1 Luminous Performance Characteristics of Commonly Used Luminaries

Type of Lamp	Lumens / Watt		Colour Rendering Index	Typical Application	Typical Life (hours)
	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	20	Excellent (100)	Display, flood lighting, stadium exhibition grounds, construction areas	2000-4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in factories, ware houses, 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 lighting, etc.	40,000-1,00,000

7. OTHER POWER CONSUMPTION

S No.	Location/Identification	Computers/ Laptops	60W Exhaust Fan	160W Exhaust Fan	Water Cooler-200W	180W-Desert Cooler	180W-Circulating Fan	Fridge	Geyser	Total
1	University Computer center	95								
2	CIL Lab				1			7	4	**12**
5	Teaching Block -8									

ANALYSIS

There should be regular maintenance schedule of Geyser and water coolers. University should install solar water heater instead of electric geysers. Solar geysers are convenient to use and cost effective as well as environment friendly. Computers, more than 5 years should be replaced with new computers/laptops.

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

ETERNAL UNIVERSITY

ENERGY AUDIT REPORT

2022-2023

PREPARED BY
EHS ALLIANCE SERVICES

CONTENTS

CERTIFICATE

EHS alliance

CERTIFICATE

PRESENTED TO

ETERNAL UNIVERSITY

Baru Sahib, Distt. Sirmour, near Rajgarh, Himachal Pradesh 173101

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 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.

EHS ALLIANCE SERVICES GURGAON

SIGNATURE

29.05.2023
DATE OF AUDIT

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

ACKNOWLEDGMENT

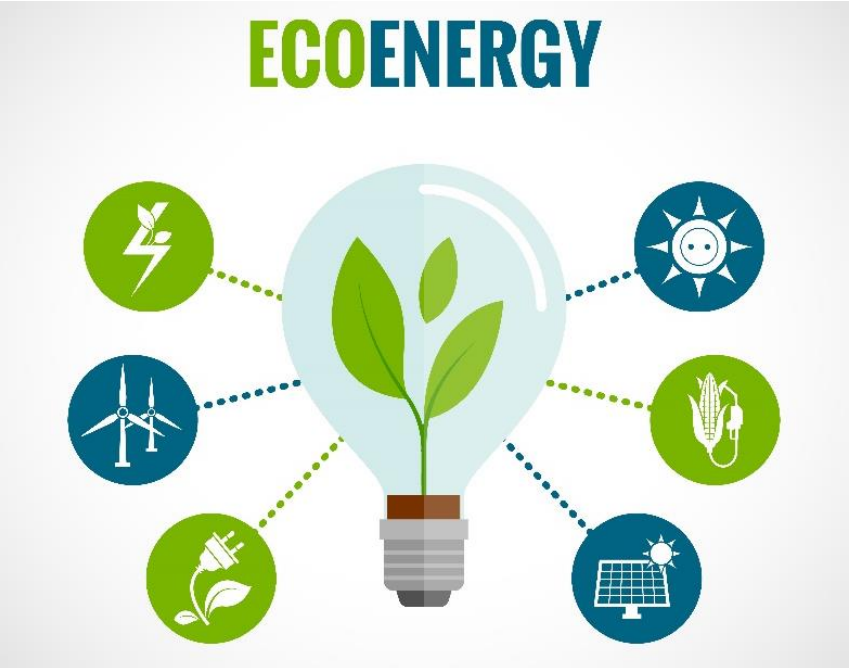
EHS Alliance Services would like to thank the management of Eternal University for assigning this important work of Energy Audit. We appreciate the cooperation of the teams for the completion of the assessment.

First of all, we would like to thank ***Prof. (Dr.) Davinder Singh, Hon'ble Vice Chancellor of Eternal University*** for giving us an opportunity to evaluate the environmental performance of the campus.

We are also thankful to

Prof. (Dr.) Amrik Singh Ahluwalia	Honorable Pro Vice-Chancellor
Prof. (Dr.) B. S. Sohal	Controller of Examination and Dean - PGS
Prof. (Dr.) N. P. Singh	Dean, Research
Prof. (Dr.) Tusshar Mahajan	Professor, Management Department

We would also like to thank ***Dr. Puneet Negi - Assistant Professor, H.O.D. Physics*** for his Continuous Support and guidance, without which the completion of the project would not been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.



DISCLAIMER

EHS Alliance Services Energy Audit Team has prepared this Energy Audit Report for Eternal University based on input data submitted by the representatives of the university 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 have been drown 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.

If you wish to distribute copies of this report external to your organization, then all pages must be included.

EHS Alliance, its staff, and agents shall keep confidential all information relating to your organization and shall not disclose any such information to any third party, except that in the public domain or required by law or relevant accreditation bodies. EHS Alliance staff, agents, and accreditation bodies have signed individual confidentiality undertakings and will only receive confidential information on a 'need to know' basis.

Vijay Singh
Lead Auditor EMS & Energy

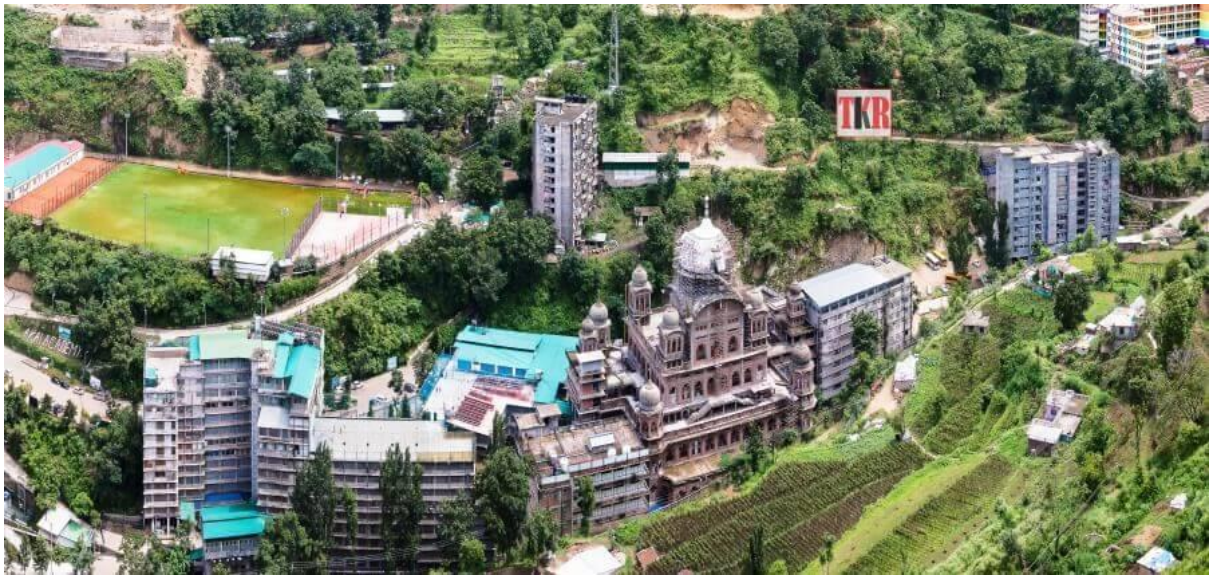
Dr. Uday Pratap
Co-Auditor EMS & Energy

ABBREVIATION

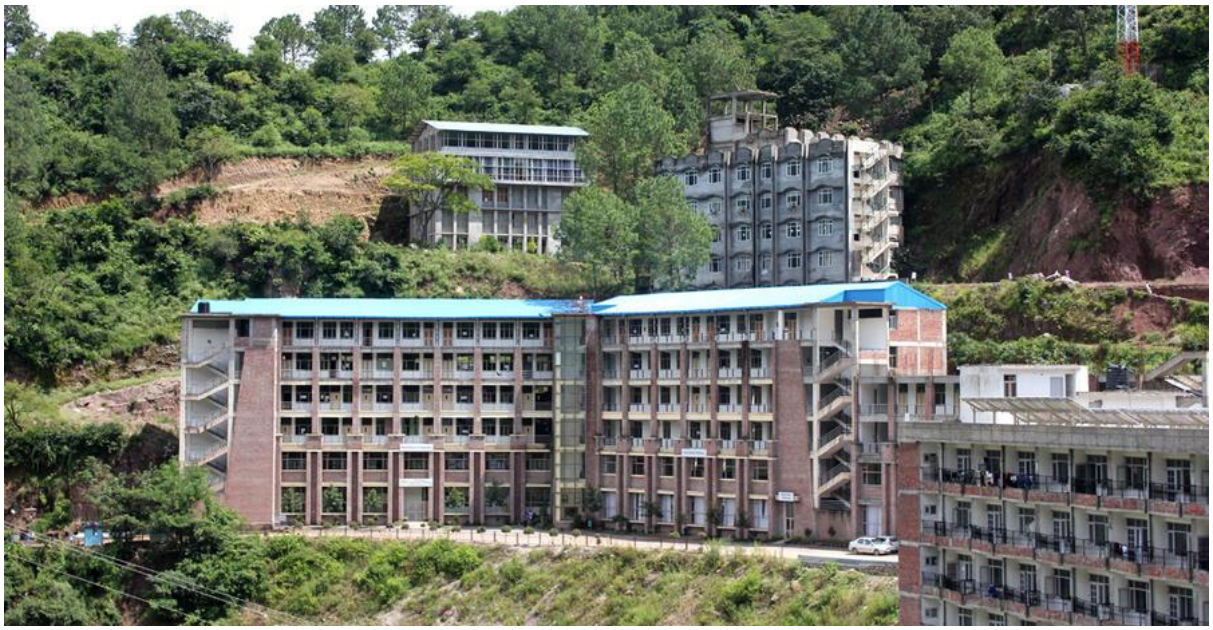
A	**Amps**
AC	**Air Conditioner**
AC	**Alternating Current**
AMET	**Academy of Maritime Education and Training**
CFL	**Compact fluorescent lamp**
CIP	**Comprehensive Inspection Programme**
DC	**Direct Current**
HSD	**High-Speed Diesel**
Hz	**Hertz**
kg	**Kilogram**
kVA	**kilo-volt-ampere**
kW	**kilo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

UNIVERSITY OVERVIEW

Eternal University is NAAC Accredited & ISO 9001: 2015 Certified University established under the Himachal Pradesh Private University (Establishment & Regulation) Act 2006 & Himachal Pradesh Government Act. 3 of 2009, with the right to confer degree as per the UGC public notice on private Universities dated April 18, 2011.



The great visionary of 20th century (Sant Attar Singh Ji) had a vision that modern scientific education alone will not serve the humanity well, until and unless it is amalgamated with Braham Vidya (Spiritual Education). The graduates of this unique education system will not only be outstanding in academics, but also will have high moral values (i.e. they will have love for humanity, compassion for the weak and the underdog, and sense of selfless service for the community). These graduates will work towards establishing permanent peace in the world. They will act as Ambassadors of Peace wherever they live, work and raise their families.



Eternal University with its seven constituent colleges is unique in imparting value-based education to female students and is the first private university of Himachal Pradesh to start the College of Nursing, School of Public Health and College of Agriculture. Among several previous recognitions, Eternal University has been recently recognized as "The 20th Best Higher Education Institution in India, 2019 which provides a broader perspective and cutting-edge higher education with a focal point on fostering skills and innovation" by EDUCATION BRAINIAC magazine.

This campus is situated in the *Valley of Divine Peace, the Modern Gurukul* provides the safest, drug and pollution-free environment with facilities such as a sports complex, gymnasium, NSS and NCC units, experimental farms, poly houses, modern dairy complex, solar power utilization systems and support for holistic development of its students. The Eternal University has organized several conferences, workshops, camps and Kisan Melas with an emphasis on addressing the crucial problems of farmers of Sirmour and adjoining districts of Himachal Pradesh for their inclusive development.

The university offers 17 Bachelor programs, 27 Master programs and 19 Doctorate programs.

Bachelor Programs

B.Sc. (Hons) Agriculture	B.Tech. Food Technology	B.Tech. CSE	B.Sc. Information Technology	B.Sc. Non-Medical
B.Sc. (Hon.) Mathematics	B.Sc. (Hons.) Microbiology	B.Sc. (Hons.) Economics	B. Ed	B.Com (Hons.)
B.B.A.	B.A. (Hons.) Music	B.A. Humanities	B.Sc. (Hons.) Psychology	B. Lib
	B.Sc. Medical	B.Tech. CSE Lateral/Migrated	*B.Sc. Nusring*	

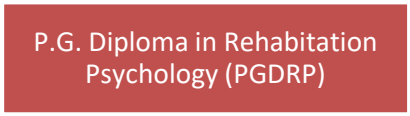
Master Programs

M.Sc. Agronomy	M.Sc. Ag. Genetics & Plant Breeding	M.Sc. Ag. (Entomology)	M.Sc. Ag. (Horticulture) Vegetable Science	M.Sc. Ag. (Horticulture) Fruit Science
M.Sc. Ag. Horticulture (Floriculture & Landscape Architecture)	M.Sc. Ag. Plant Pathology	M.Sc. Agricultural Economics	M.Sc. Food Science & Technology	M.Tech. Food Technology
M.Tech. CSE	M.Sc. Botany	M.Sc. Chemistry	M.Sc. Mathematics	M.Sc. Microbiology
M.Sc. Physics	M.Sc. Zoology	M.P.H	M.Sc. Economics	M.Com.
Master of Business Administration	M.A. Music	M.A. (Hons.) Punjabi	M.Sc. Psychology	M.A. English
	M.A. Education	M.Sc. Biotechnology	M.Sc. Nusring	

Doctorate Program

Certificate Courses

Diploma Course



Adon-Courses

VISION | MISSION

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The relatively young Eternal University with its diverse programmes, priorities, commitments, values and efforts strives to emerge as a world-class women university with its centres of excellence in science, technology, arts and management. Major emphases will be focused on developing and strengthening industrial-institution linkages and harnessing strength of its alumni for skill development, technology transfer, resources generation and employment opportunities. Its graduates engrossed with holistic development, human values, professional ethics and skills and entrepreneurship will adapt and earn comfortable livelihood and serve the mankind with love and devotion for its inclusive and sustainable development as our ambassadors of universal brotherhood for world peace."

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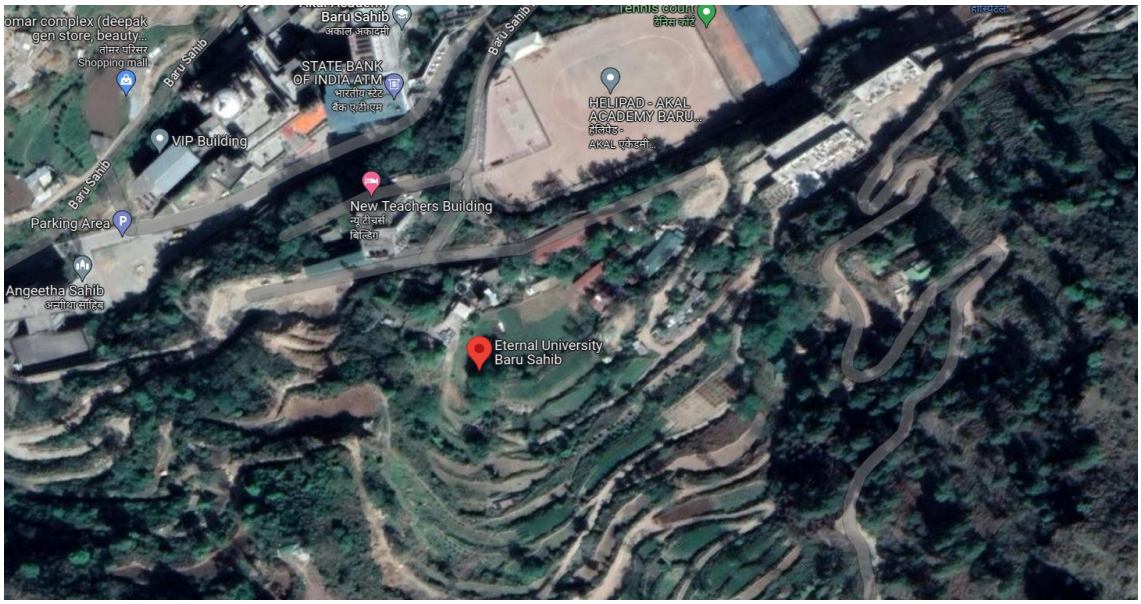

Geo-tagging Coordinates: 30.7539376, 77.2970275

AUDIT PARTICIPANTS

On behalf of the University

Name	Designation
Prof. (Dr.) Davinder Singh	*Honorable Vice Chancellor*
Prof. (Dr.) Amrik Singh Ahluwalia	*Honorable Pro-Vice Chancellor*
Prof. (Dr.) B. S. Sohal	*Controller of Examination and Dean-PGS*
Prof. (Dr.) N. P. Singh	*Dean, Research*
Prof. (Dr.) Tusshar Mahajan	*Professor, Management Department*
Dr. Puneet Negi	*Assistant Professor and HoD, Physics*
Mr. B. S. Kapoor	*Accounts Officer*
Er. Rajeev Thakur	*Assistant Professor, CSE*
Mr. Sukhwinder Singh	*Transport Manager*
Er. Hemant Singh	*Electrical Engineer*
Mr. Santosh Sukla	*Solid Waste Management supervisor*
Mr. Manoj	*Wastewater treatment supervisor*

On behalf of EHS Alliance Services

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ENERGY AUDIT ANALYSIS

1. ENERGY CONSUMPTION

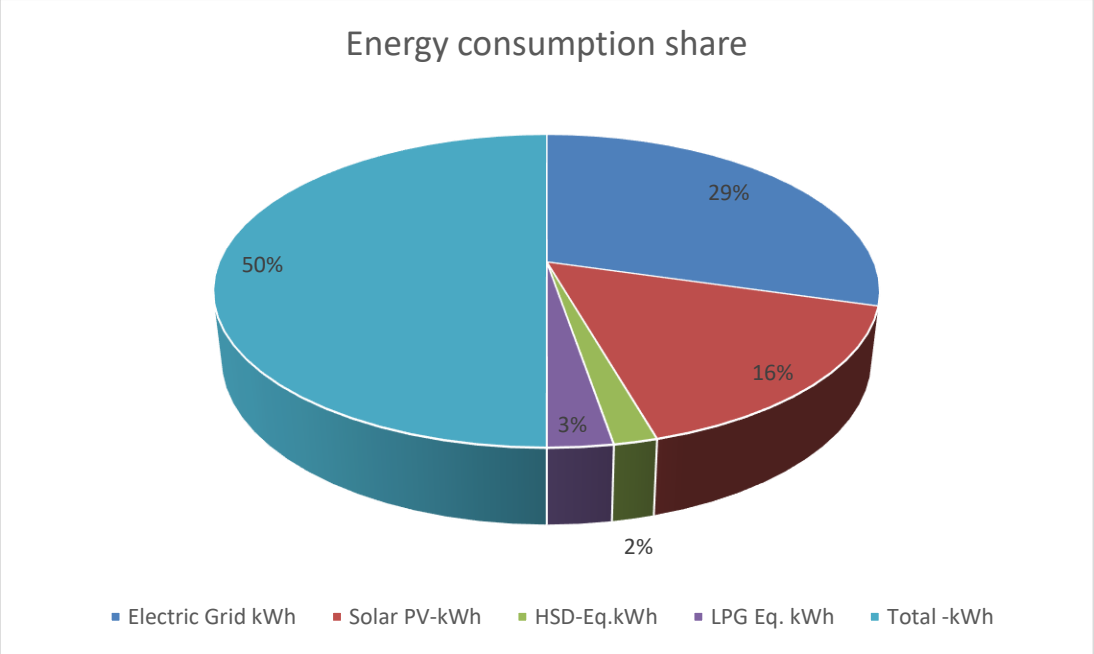
1.1 Summary of Monthly Electricity Consumption and Total Bill Amount

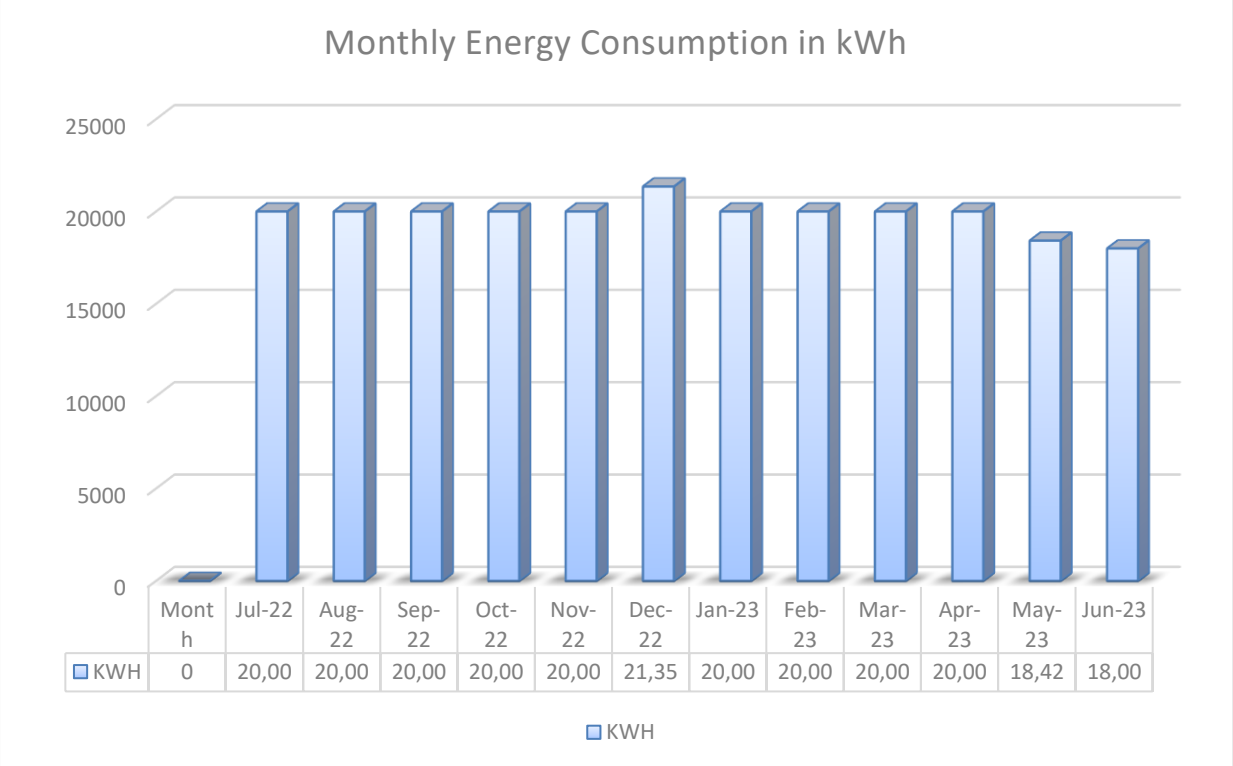
To understand the Energy consumption trend and to develop the baseline parameter we have collected monthly energy bills for the 12 months i.e. from July 22 to June 23.

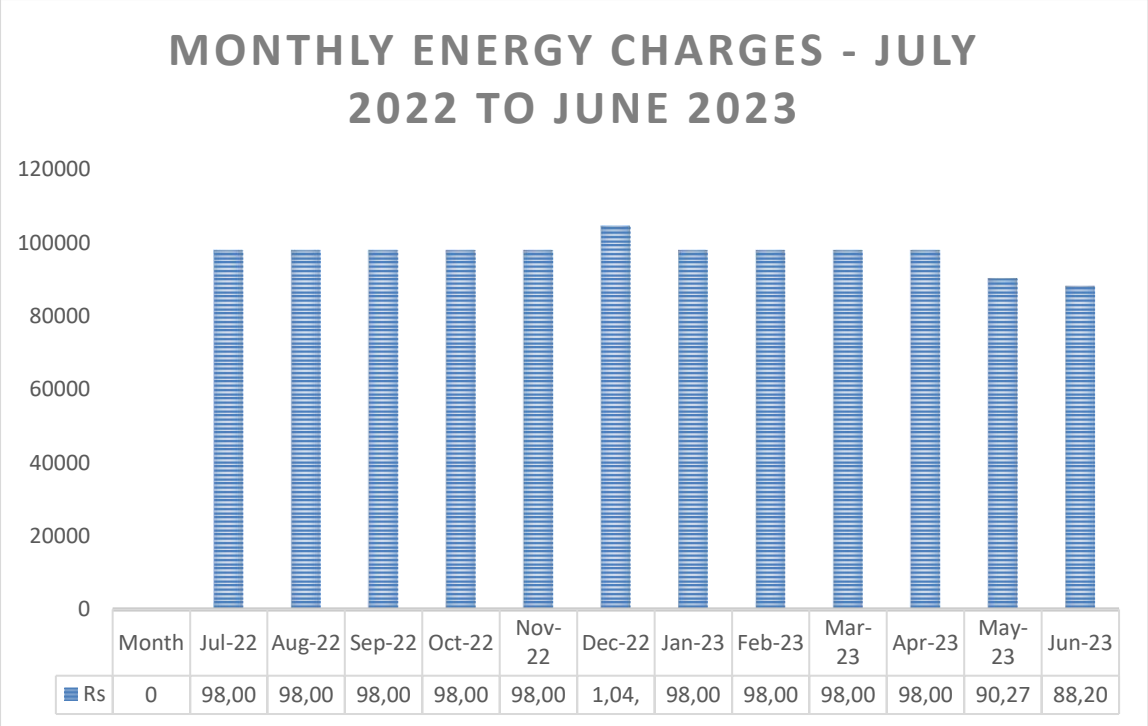
Month	Grid Units	Amount	Solar Units	Net Metering Units	Amount
Jul-22	20,000	4.90	9,186	20,000	98,000
Aug-22	20,000	4.90	9,495	20,000	98,000
Sep-22	20,000	4.90	9,800	20,000	98,000
Oct-22	20,000	4.90	10,085	20,000	98,000
Nov-22	20,000	4.90	10,384	20,000	98,000
Dec-22	21,353	4.90	10,686	21,353	1,04,630
Jan-23	20,000	4.90	10,981	20,000	98,000
Feb-23	20,000	4.90	11,300	20,000	98,000
Mar-23	20,000	4.90	11,600	20,000	98,000
Apr-23	20,000	4.90	11,910	20,000	98,000
May-23	18,423	4.90	12,225	18,423	90,273
Jun-23	18,000	4.90	12,000	18,000	88,200
SUM	**2,37,776**		**1,29,652**	**2,37,776**	**11,65,102**

1.2 Overall annual energy consumption and energy sources

Energy Share	kWh	Percentage	
Electric Grid kWh	2,37,776	58.94%	
Solar PV-kWh	1,29,652	32.14%	
HSD-Eq. kWh	14,400	3.57%	
LPG Eq. kWh	21,600	5.35%	
Total -kWh	**4,03,428**	**100%**	


Energy consumption share
29%
16%
3%
2%
50%
Electric Grid kWh
Solar PV-kWh
HSD-Eq.kWh
LPG Eq. kWh
Total -kWh


Monthly Energy Consumption in kWh
25000
20000
15000
10000
5000
0
Month
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
May-23
Jun-23
KWH
0
20,00
20,00
20,00
20,00
20,00
21,35
20,00
20,00
20,00
20,00
18,42
18,00
KWH



2. DIESEL CONSUMPTION

Below is the diesel consumption detail in liters from October 2020 to September 2021.

Month-wise Diesel Consumption (Liters) for one year	
Period	**Diesel Consumption (Liters)**
Jul-22	1200.00
Aug-22	1200.00
Sep-22	1200.00
Oct-22	1200.00
Nov-22	1200.00
Dec-22	1200.00
Jan-23	1200.00
Feb-23	1200.00
Mar-23	1200.00
Apr-23	1200.00
May-23	1200.00
Jun-23	1200.00
Total	**1,44,000**

Note: The University shares 30% of energy usage of the same electricity bill with different entities on the University campus.

3. ANALYSIS OF DG SETS

In the university, there is one Diesel Generator (DG) set for its electrical power needs in case of Grid power failure. The total installed DG set capacity is 250 kVA.

DG Set Performance		
Description	**Unit**	**DG at Station 1**
Design details:		
Description	Unit	DG
Rated capacity	kVA	250
Hz	Hz	50
Volts	Volts	415
PF	PF	0.8
Phase	Phase	3
RPM	RPM	1500
Operating details:	Hours	8
Operating hours during testing	Hours	0.50
Operational details:		
Operating hours during testing	Hours	0.50
% Loading	%	67.51
Energy Generation	kWh	33.35
Load	KVA	84.4
Fuel consumption during testing	Litre	10.80
Specific energy generation	kWh/liter	3.09

Observation and Suggestions: - As per the trial taken during the energy audit the percentage loading of DG set is 67.51% which is ok and the specific energy consumption of DG Sets is 3.09 KWH/Liter which is satisfactory because as per the manufacturer recommendation, the best practices for SEC in DG sets range from 3.0 to 3.5 kWh/liter and above.

4. AC SYSTEM

Energy Efficiency Ratio (EER): Performance of smaller chillers and rooftop units is frequently measured in EER rather than kW/ton. EER is calculated by dividing a chiller's 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 as air-conditioning tonnage.

There are Split ACs installed in Eternal University in various areas of various capacity which detail is given below: -

S. No.	Type of AC	Rated capacity (TR)	Room Temp. (°C)	AC-Tout (°C)	AC-Tin (°C)	Room-RH (%)	Area (m2)	Air velocity (m/s)	Enthalpy Hout	Enthalpy Hin	Heat Load in TR	KW supplied	(Eff.) Power per Ton (KW/TON)	EER
1	Split	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.5	2.3
2	Split	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.7	2.1
3	Split	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.5	2.3
4	Split	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.7	2.1
	Split	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.5	2.3
5	Split	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.5	2.3
6	Split	1.5	23	12	20	52	0.03	2	25	38	0.3	0.6	1.7	2.1
7	Split	1.5	24	10	18	52	0.03	2	24	37	0.4	0.5	1.5	2.3

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

5. CEILLING FANS ANALYSIS

In the university, 462 nos. Ceiling Fans are installed and observation and suggestion are given below.

S. No.	Location/Identification	Ceiling Fan-70W/80W
1	B.ED. College	105
2	NGH	521
3	Nursing College	114
4	Nursing Hostel	350
5	University A-Block	138
6	University B-Block	118
	Total Count	**1,409**

Observation and Suggestions: -

In the university, old ceiling fans of 70W are installed but BEE 5 Star Rated of 30W Ceiling Fans are present in the market. Therefore, we suggest to replace BEE 5 Star rated fans of 30W.

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

Total no of Ceiling Fans (70/80W)	=	1,409	Nos.
Total wattage of 60W Ceiling Fans	70	98,630	Watt
Total wattage of BEE 5 Star rated Fans (30W)	30	42,270	Watt
Total saving in Wattage after replacement	=	56,360	Watt
Operating hours per day	=	8	Hours
Operating days per annum	=	222	Days
Energy charges per unit in Rs.	=	4.9	INR
Saving in Rs./annum	=	4,90,467.26	INR
Investment INR	2,500	3,52,500.00	INR
Payback period: - Months	=	7.18	YEARS

Note:- Energy savings will increase or decrease if the operating hours of the machine /equipment will be increase or decrease 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 has been done.

6.2 Inventory of Lighting

Location	20W LED	10W LED	5W LED	Rod/Chock Tube LED 20W
B.Ed. College	60	14	4	65
NGH	343	57	77	185
Nursing College	26	20	8	54
Nursing Hostel	177	55	62	126
University A-Block	96	33	31	89
University B-Block	37	9	16	125
University C-Block	82	1	38	72
Grand Total	**821**	**189**	**236**	**716**

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

University has efficient lighting solution. LEDs saves energy, the life span is much greater and emit virtually no heat. We recommend to install the sensor-based lights for common areas like corridors, washrooms, library, canteen, common rooms, faculty rooms, etc.

We also recommend to use solar lights for open areas like parking, ground, street lights, etc.

The table below shows the performance characteristics comparison of all luminaries.

Table 8.1 Luminous Performance Characteristics of Commonly Used Luminaries

Type of Lamp	Lumens / Watt		Colour Rendering Index	Typical Application	Typical Life (hours)
	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	20	Excellent (100)	Display, flood lighting, stadium exhibition grounds, construction areas	2000-4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in factories, ware houses, 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 lighting, etc.	40,000-1,00,000

7. OTHER POWER CONSUMPTION

Row Labels	60W Exhaust Fan	160W Exhaust Fan
B.Ed. College	7	
NGH	31	
Nursing Hostel	16	2
Nursing College	4	
University A-Block	41	
University B-Block	9	
University C-Block	8	
Grand Total	**116**	**2**

ANALYSIS

There should be a regular maintenance schedule for Geysers and water coolers. The university should install solar water heaters instead of electric geysers. Solar geysers are convenient to use and cost-effective as well as environmentally friendly. Computers, more than 5 years should be replaced with new computers/laptops.

8. WATER PUMPS

Eternal University is using spring water for all domestic usage after filtration. The university regularly tests water quality with NABL-approved labs for drinking and other uses. The spring water comes from the hilltop and with the use of gravity, there is a rare use of water pumps on the campus for pumping water to building top tanks. Hence, this is a very good practice to have natural and energy-efficient practice for water pumping.

9. CAPACITOR BANK

The capacitor bank is not available on the Eternal University campus.

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