

3. ENERGY CONSERVATION

3.1 Describe energy management systems and how energy is sourced, consumed, and optimized across the campus. [Share the attachment link in google-drive, if content limit exceeds 300 words]

(Types of energy the university uses (renewable vs. non-renewable), energy efficiency measures, and any initiatives in place to reduce energy consumption or carbon emissions)

Hindusthan College of Engineering and Technology (HiCET) has implemented a comprehensive energy management system that prioritizes sustainability, efficiency, and carbon reduction. The institution utilizes both renewable and non-renewable energy sources, with a strong emphasis on transitioning towards cleaner solutions. HiCET relies on energy sources such as grid electricity, LPG for cooking, and diesel for transportation and backup power. The institution simultaneously works towards reducing its carbon footprint and has set a long-term goal of achieving carbon neutrality by 2050.

The 65 kW solar PV system significantly contributes to the campus's electricity needs, with any surplus energy efficiently exported back to the grid. Additionally, solar thermal systems supply hot water in hostels, reducing reliance on traditional heating methods. A 35m³ biogas plant converts organic food waste into renewable energy, minimizing LPG consumption and supporting sustainable waste management.

To enhance energy efficiency, HiCET has implemented LED lighting systems, solar street lights, energy-efficient HVAC systems, and Energy Star-rated appliances, significantly lowering electricity demand. The campus promotes sustainable transportation, encouraging the use of electric vehicles and bicycles to reduce fuel consumption and emissions. HiCET conducts annual energy audits in collaboration with M/s. Ram Kalam Centre for Energy Consultancy and Training to monitor efficiency, identify inefficiencies, and recommend improvements. Sustainable building designs and insulation techniques further optimize energy use by minimizing heating and cooling demands.

As part of its roadmap to carbon neutrality, HiCET plans to increase renewable energy capacity, implement zero-waste policies, expand afforestation projects, and transition to a fully electrified campus transportation system. These initiatives align with UN SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action), reinforcing the institution's commitment to environmental responsibility and sustainable energy management.

3.2 Mention the list of utilities (in active usage)

(Detailed list of all the utility services that the university uses to support its operations. Utilities refer to the services provided to meet the basic needs of the campus)

S. No.	Name of the Equipment	Make / Model	Specification / Capacity	Total No.
1.	Power Factor Controller	AEE	50kVar /440V / 50Hz	1
2.	Maximum Demand Controller	Schneider EM7230-DN3B-400D	112kW	1
3.	Digital Energy Meters	SELEC-MFM383A & Power Tech Measurements System	3 Phase / 1600imp/kWh	3
4.	Analog Energy Meters	Havell's India Ltd.	3 Phase	3
5.	Solar Panels	Adani Solar	300W	23
6.	Inverters	Solaris	25kVA	3
7	Bi Directional Energy meter (Net Meter)	Avon	6400imp/kWh	1
8	Distribution Panels	Vivin Industries/ AEM-3CT	-	8
9	Digital Clamp meter	MECO	-	2
10	Analog Multimeter	Brother	-	1
11	Digital Multimeter	MECO	-	5
12	LED Lights	Eveready	10 Watts	175
13	LED Lights	Eveready	20 Watts	730
14	LED Lights	Eveready	22 Watts	280
15	BLDC Fan	Atomberg		200
16	LED monitors			1759
17	LCD Boards			25

3.3 Brief Description on the usage, maintenance and support-facility of : (1)Electricity (2)Steam (3)Water (4)Compressed Air (5)Cooling Water (If the university is actively reducing its consumption or improving the sustainability of these utilities that could positively influence its ranking.)

Hindusthan College of Engineering and Technology (HiCET) has implemented a structured approach to managing electricity and water resources, ensuring efficiency, conservation, and continuous maintenance. These efforts align with sustainable development goals and contribute to the institution's commitment to environmental responsibility.

For electricity usage, HiCET has adopted several energy conservation measures. A key initiative is the installation of a 65 kW solar power plant, which significantly reduces the campus's dependence on conventional electricity sources. Energy-efficient infrastructure, including LED lights, solar-powered lights, and Energy Star-rated appliances, helps in minimizing electricity consumption. The institution employs smart energy management systems, incorporating power factor controllers, digital and analog energy meters, to optimize power consumption. Additionally, sustainable transportation practices, such as the use of electric vehicles and bicycles for on-campus mobility, help minimize fuel consumption and carbon emissions. To ensure continuous improvement, periodic energy audits are conducted in collaboration with energy consultants, identifying opportunities to enhance efficiency and sustainability.

Water management at HiCET is equally comprehensive. The institution sources water from municipal supply as well as bore wells, ensuring a steady and reliable supply. To maintain water quality, strategically placed water purifiers provide safe drinking water for students and staff. Rainwater harvesting systems have been installed to reduce dependency on external sources, and a wastewater treatment plant with a substantial processing capacity of 250 KLD operates efficiently using Moving Bed Biofilm Reactor (MBBR) technology. The treated water is repurposed for irrigation (using drip and sprinkler systems) and other non-potable applications, reducing overall freshwater consumption. Additionally, the institution has implemented leak prevention measures, automatic water level controllers in overhead tanks and push-fit taps to minimize wastage.

The institution collaborates with NGOs and government agencies to enhance conservation efforts and introduce innovative solutions. Regular environmental and energy audits ensure continuous monitoring and necessary improvements.

3.4 When was the last-time "Energy Audit" carried for the campus?

10 June 2024

3.5 Details (Name and Communication Address - Website/Email/Phone) of the Agency who has certified for the "Green Audit"

Ram-Kalam Centre for Energy Consultancy and Training

Mobile: +91- 80567 19372, 99420 14544 (Whatsapp)

E-mail: ramkalamcct@gmail.com

Website: www.ramkalam.com

3.6 Evidence of energy efficiency plan to reduce overall energy consumption and Strategic plans to upgrade existing infrastructure to higher energy efficiency buildings.

The "Roadmap to Achieve Carbon Neutrality" outlines a strategic plan for achieving carbon neutrality at Hindusthan College of Engineering and Technology (HICET) by 2050. The initiative focuses on reducing greenhouse gas (GHG) emissions across campus operations, aligning with the GHG Protocol's principles of relevance, completeness, consistency, transparency, and accuracy.

The roadmap addresses both direct emissions (Scope 1) from on-campus fossil fuel use and indirect emissions (Scope 2) from purchased electricity. Key strategies include transitioning to renewable energy sources, improving energy efficiency, promoting sustainable transportation, and enhancing waste management.

A baseline carbon footprint assessment (2023) serves as a reference, with emissions categorized by energy use, transportation, waste, water consumption, and food supply. The plan sets short-term (2025-2030), medium-term (2031-2040), and long-term (2041-2050) goals, including a 10-15% emissions reduction by 2030, 30-40% by 2040, and full carbon neutrality by 2050.

Emission reduction strategies involve retrofitting buildings with energy-efficient systems, increasing solar and wind energy use, expanding electric vehicle infrastructure, and encouraging sustainable procurement. Carbon offset initiatives such as reforestation and direct carbon capture are also integrated.

Monitoring, reporting, and verification systems ensure transparency, with smart meters, annual sustainability reports, and third-party audits. Stakeholder engagement is promoted through workshops and student-led initiatives. Potential risks, such as financial and technological barriers, are addressed with adaptive strategies. Continuous improvement, regular reviews, and communication efforts ensure the roadmap's effectiveness and future sustainability beyond carbon neutrality.



Fig. 3.1 Solar PV Plant



Fig. 3.2 Solar Energy Meter Reading



Fig. 3.3 Smart Energy Meter



Fig. 3.4 Energy Audit Certificate



Fig. 3.5 Environment Audit Certificate



Fig. 3.6 Green Campus Audit Certificate