[CORE] Social Responsibility (SR)

Sub Criterion: 5.3

SR4 Environmental impact

Sustainability Report

Sustainable and Clean Energy (SDG 7)

Swami Rama Himalayan University (SRHU) has consistently championed the cause of clean and sustainable energy, aligning its operations, infrastructure, and research with the global vision of Sustainable Development Goal 7: "Affordable and Clean Energy." With a strong institutional commitment to environmental stewardship, SRHU has integrated renewable energy solutions, energy-efficient technologies, and sustainable practices across its campus. Through strategic initiatives such as large-scale solar power installations, advanced HVAC systems, LED retrofitting, and sensor-based automation, the university not only reduces its carbon footprint but also models responsible energy management. SRHU's contributions go beyond implementation—its research ecosystem actively explores innovative energy technologies and circular economy models, reinforcing its leadership in higher education's transition to a low-carbon future.

1. Renewable Energy Integration

a. Solar Power Systems Solar Energy

Swami Rama Himalayan University (SRHU) continues to lead by example in its commitment to sustainability and environmental responsibility. Embracing renewable energy as a core strategy to reduce its carbon footprint, SRHU has made significant strides in solar energy adoption over the past few years directly, aligning with SDG Target 7.2: *"By 2030, substantially increase the share of renewable energy in the global energy mix."*

Over the past three years, the University's rooftop solar power plants have generated a total of 6,112,417 kWh of clean energy, resulting in cost savings of approximately ₹1.96 crore. This clean energy production accounted for 13.99% of SRHU's total electricity demand of 43,682,417 kWh during the same period. These efforts support SDG Target 7.1: *"By 2030, ensure universal access to affordable, reliable and modern energy services,"* by promoting access to modern and clean energy on its campus and beyond.

Total power generated through solar power plants in the last 3 years – 71,60,055 kWh and savings of Rs. 2.51 Cr

- 2022-2023 – 20,93,841 kwh & Rs. 63,23,399/-
- 2023-2024 – 21,04,000 kwh & Rs. 78,90,000/-
- 2024-2025 – 29,62,214 Kwh & Rs. 1,09,28,081/-

Contribution from Renewal Energy on total power demand

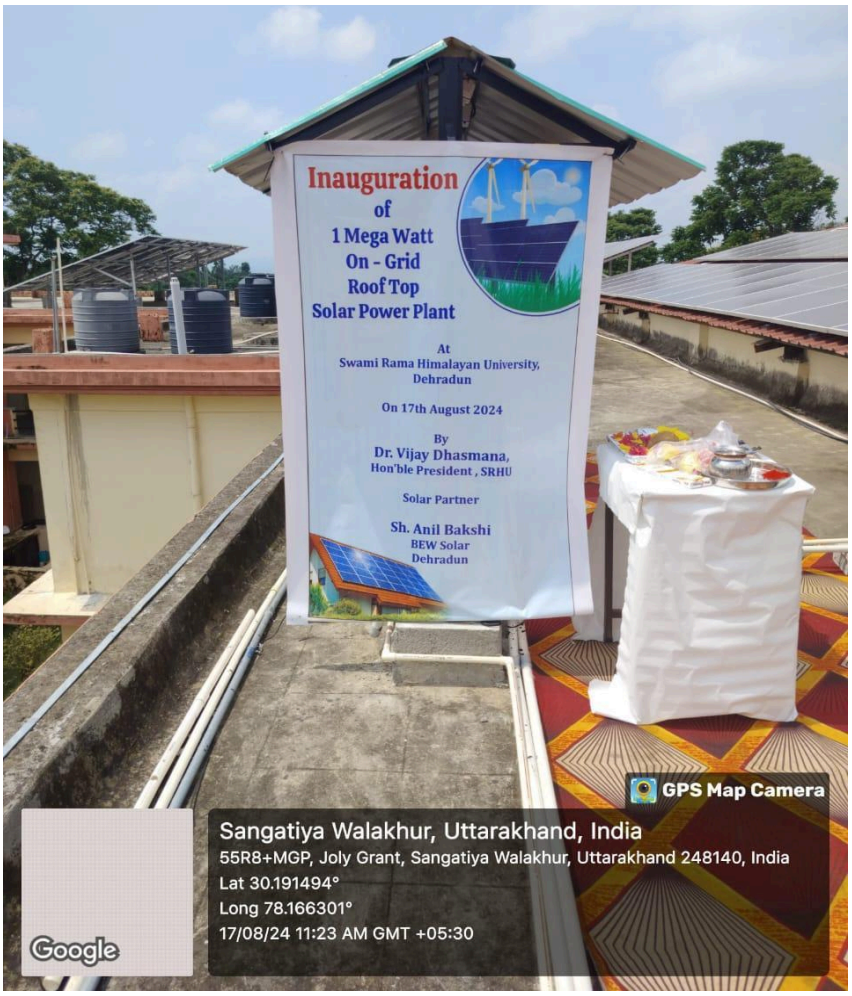
- 2022-2023 – 16.28 %
- 2023-2024 – 14.76 %
- 2024-2025 – 17.43%

Electrical unit exported to grid

- 2022 – 2023 – 1,21,260 kwh
- 2023 – 2024 – 1,14,796 kwh
- 2024 – 2025 – 1,38,312 Kwh

In a further demonstration of its long-term commitment to sustainability, SRHU commissioned a new 1 megawatt (MW) rooftop solar power plant on 17 August 2024, under a Power Purchase Agreement (PPA) with M/S Baskhi Engineering Works. This state-of-the-art, on-grid installation features monocrystalline dual-side solar panels, each with a capacity of 545 watts, and spans an area of approximately 4,500 square meters on campus. The plant is projected to generate around 136,435 kWh per month, further reducing the university's reliance on fossil fuels and reinforcing its role as a green campus- advancing SDG Target 7.3: *"By 2030, double the global rate of improvement in energy efficiency."*

Through these initiatives, SRHU continues to set a benchmark for higher education institutions striving to integrate sustainability into their infrastructure and operations while making tangible contributions toward the achievement of SDG7.



Inauguration of the new 1 MW rooftop solar plant at the University building, SRHU

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New 1000 kW rooftop solar plant inaugurated at SRHU by Chairman Dr Vijay Dhasmana

By Garhwal Post - September 7, 2024 848 0

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By OUR STAFF REPORTER

Dehradun, 6 Sep: Swami Rama Himalayan University (SRHU), Jolly Grant, has set yet another example in the field of energy conservation. A new 1000 kW rooftop solar plant has been installed, with the formal inauguration done by Chairman Dr Vijay Dhasmana. With this, the university's total rooftop solar plant capacity has increased to 2500 kW.

According to a report, global carbon dioxide emissions are nearing pre-pandemic levels. SRHU Chairman Dr Vijay Dhasmana said the main reason for this is the massive increase in electricity consumption in large institutions. Solar energy is the best option to reduce electricity consumption, as the sun has always been the most reliable source of energy.

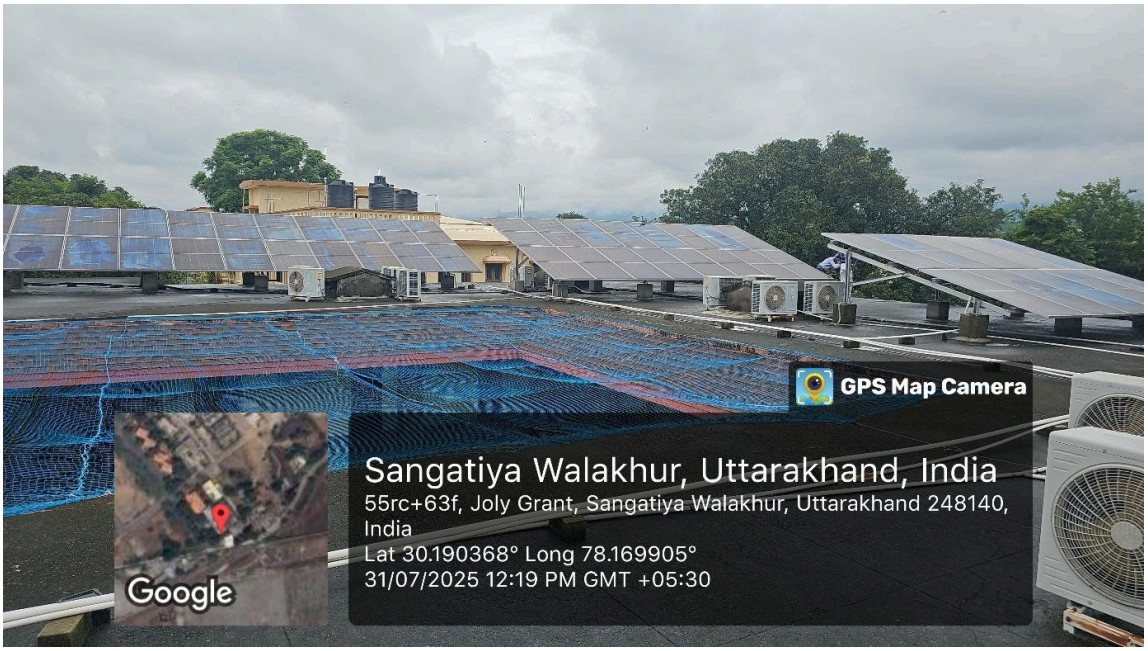
Dr Dhasmana explained that the institution understands the importance of solar energy. A committee of experts was formed within the institute. In 2007, recognising future needs, the first step toward energy conservation was taken. Solar water heater panels were installed in the Himalayan Hospital, Cancer Research Institute, and all the hostels.

Dr Dhasmana further mentioned that, in 2017, the decision was made to join the National Solar Mission. Considering the 70% subsidy provided by the government for rooftop solar energy production in Himalayan states, the decision to install solar panels was made. A 500 kW rooftop solar panel was installed in the Nursing and Medical College.

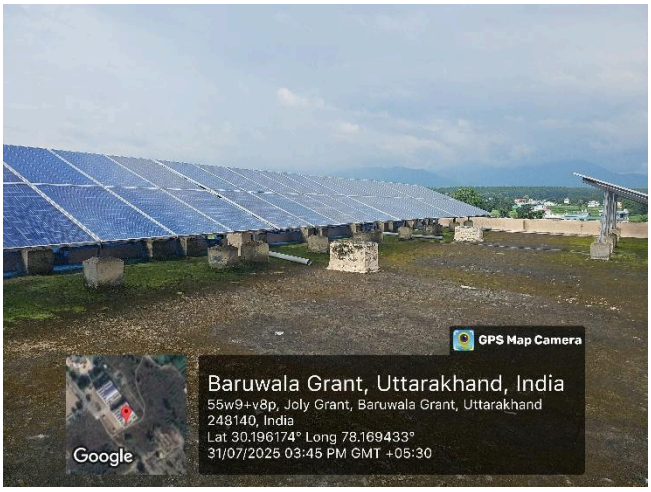
Dr Dhasmana shared that since 2017, 2500 kW of solar panels have been installed on the

News coverage of new solar plant installation at Swami Rama Himalayan University with capacity of 1000Kw

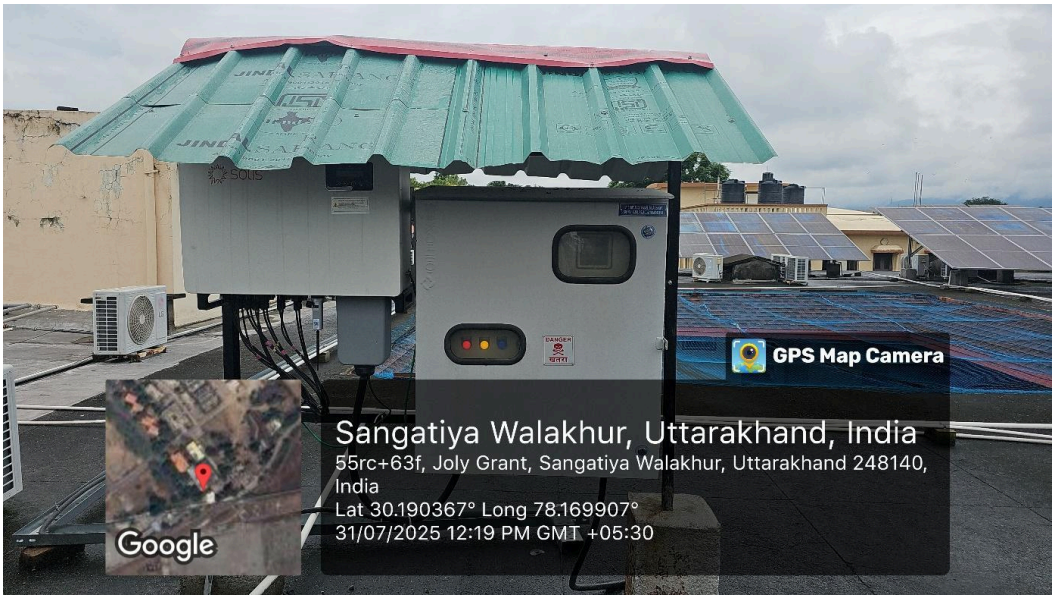
(For more information)



Rooftop Solar Panels at the Guest House

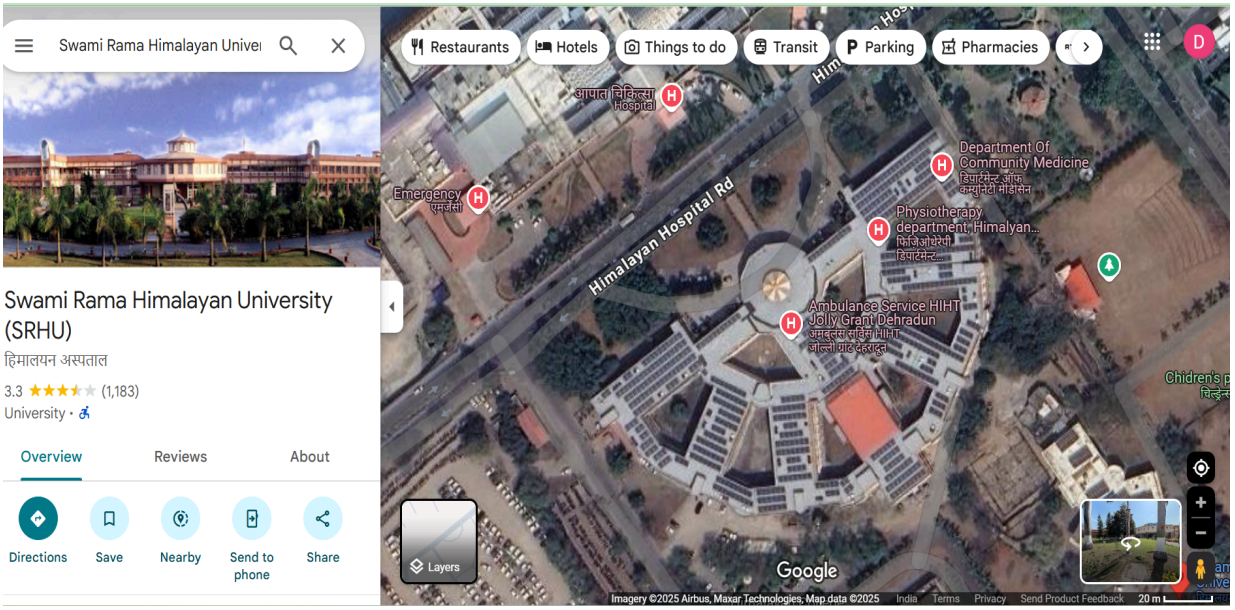


Rooftop solar panels at School of Management and School of Science and technology harnessing renewable energy to promote sustainability and reduce carbon footprint.

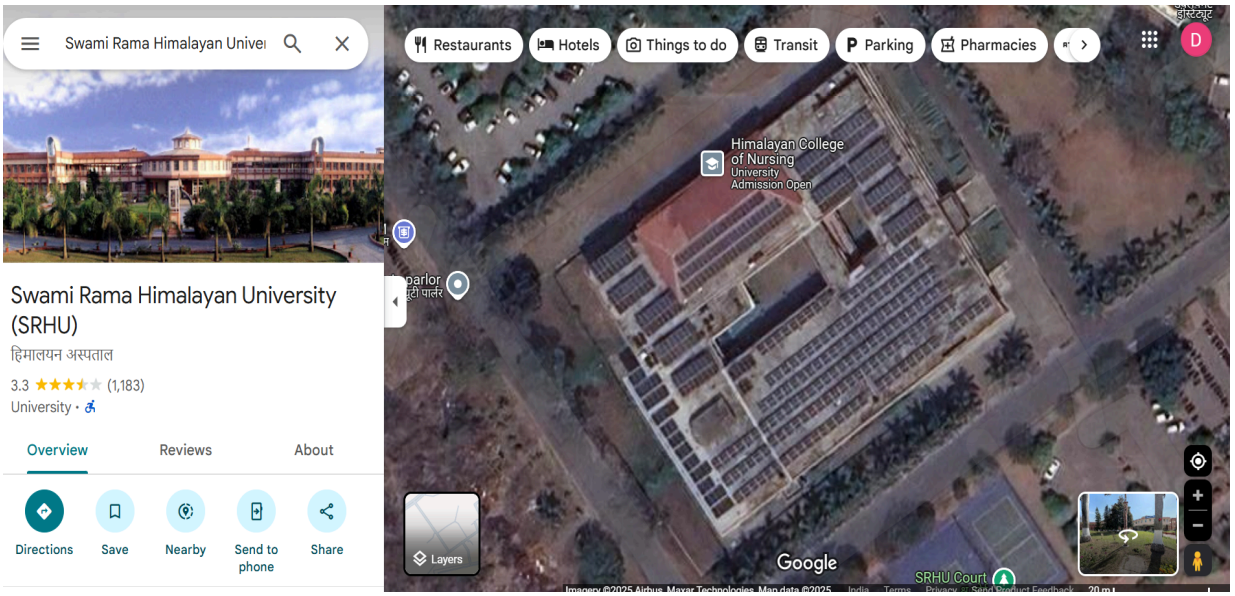


Inverter and Electrical Control Panel at the Guest House Rooftop

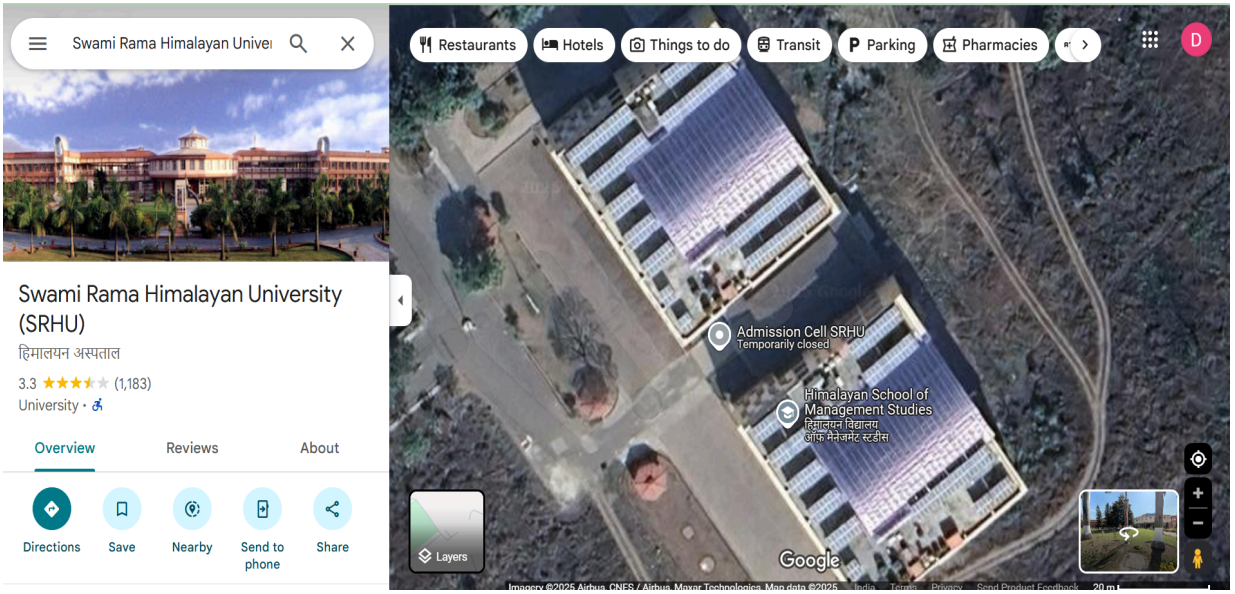
Solar PV plant on- grid inverter for wheeling to the grid



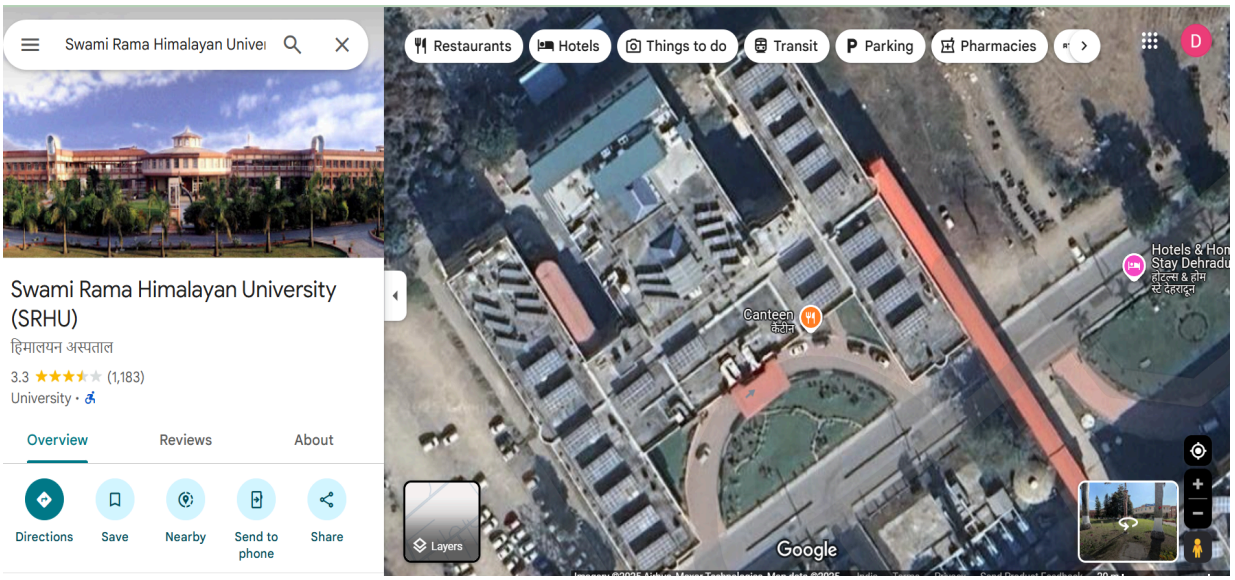
Aerial view of Solar panels at HIMS (Google Maps)



Aerial view of Solar panels at HCN (Google Maps)



Aerial view of Solar panels at SMS and SST (Google Maps)



Aerial view of Solar panels at Cancer Research Institute (CRI), SRHU (Google Maps)

SRHU has made significant strides in integrating renewable energy into its healthcare infrastructure. With an installed capacity of 50,000 litres per day (LPD) solar water heating system, the university has effectively replaced conventional energy sources for water heating needs across its Hospital, Cancer Research Institute wards, and residential hostels, ensuring a round-the-clock supply of hot water.

This green initiative has led to substantial energy and cost savings:

- Annual electricity savings equivalent to 7,50,000 kWh
- Thermal energy savings of over 8,100 GJ in the last three years
- Cumulative savings of 22,50,000 kWh and approximately ₹1.28 crore

Year-wise financial savings include:

- ₹41.40 lakh in 2022–23 (tariff ₹5.52/kWh)
- ₹46.87 lakh in 2023–24 (tariff ₹6.25/kWh)
- ₹54.75 lakh in 2024–25 (tariff ₹7.30/kWh)

The University's efforts have also been supported by a ₹24.78 lakh subsidy from UPCL over the last three years, underscoring institutional commitment and stakeholder support toward clean energy adoption and climate action.

Solar water Heater installed at the rooftop of working women hostel

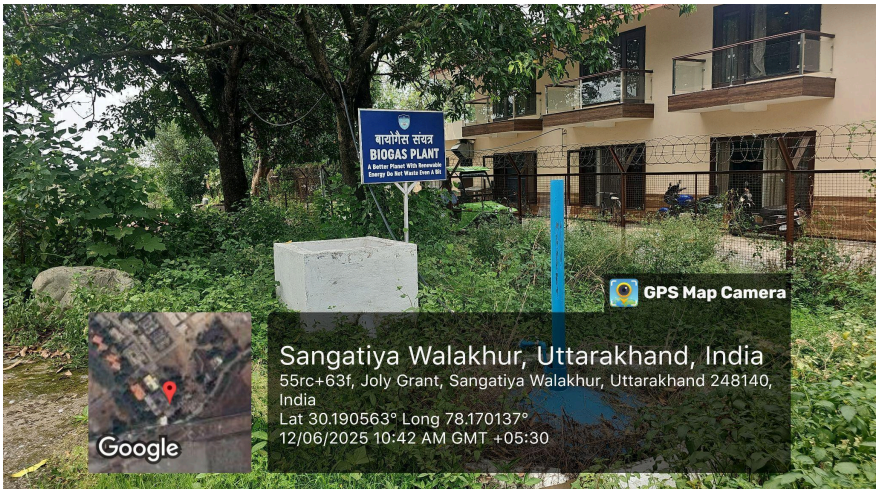
b. Biogas Plant

- Area: 750 Sq ft
- Capacity: 4 M3/ day

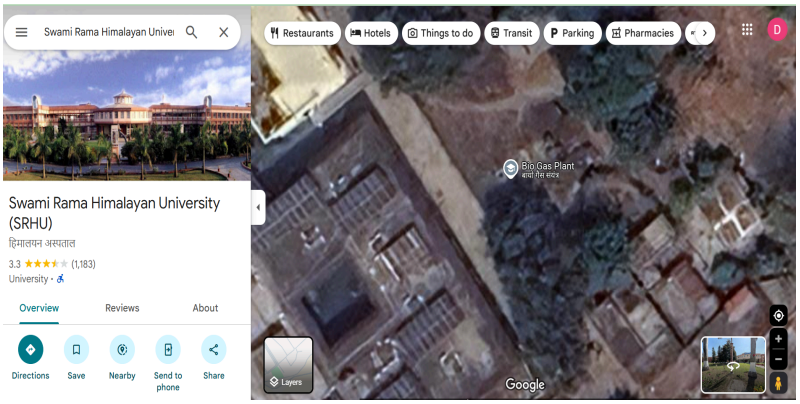
The University has strengthened its commitment to sustainable energy practices by setting up an in-house biogas plant on campus- —an initiative that directly contributes to **SDG Target 7.2**: *"By 2030, substantially increase the share of renewable energy in the global energy mix"*.

Located behind the university guest house, the biogas plant has a daily capacity of 4 cubic meters (m^3) and operates using cow dung from the campus dairy and vegetable waste from the guest house kitchen as feedstock. The biogas generated is efficiently utilized for cooking in the guest house kitchen, offering an eco-friendly alternative to conventional fuels. This initiative has led to an annual saving of 685.44 kg of LPG, which is equivalent to approximately 36 commercial LPG cylinders. It also aligns with **SDG Target 7.1**: *"By 2030, ensure universal access to affordable, reliable and modern energy services,"* by promoting access to clean, cost-effective cooking fuel within the campus community.

Beyond energy savings, the project plays a crucial role in organic waste recycling, promoting a circular approach to resource management and contributing meaningfully to the nation's energy conservation goals.



Biogas plant at Swami Rama Himalayan University converts organic waste into clean cooking fuel



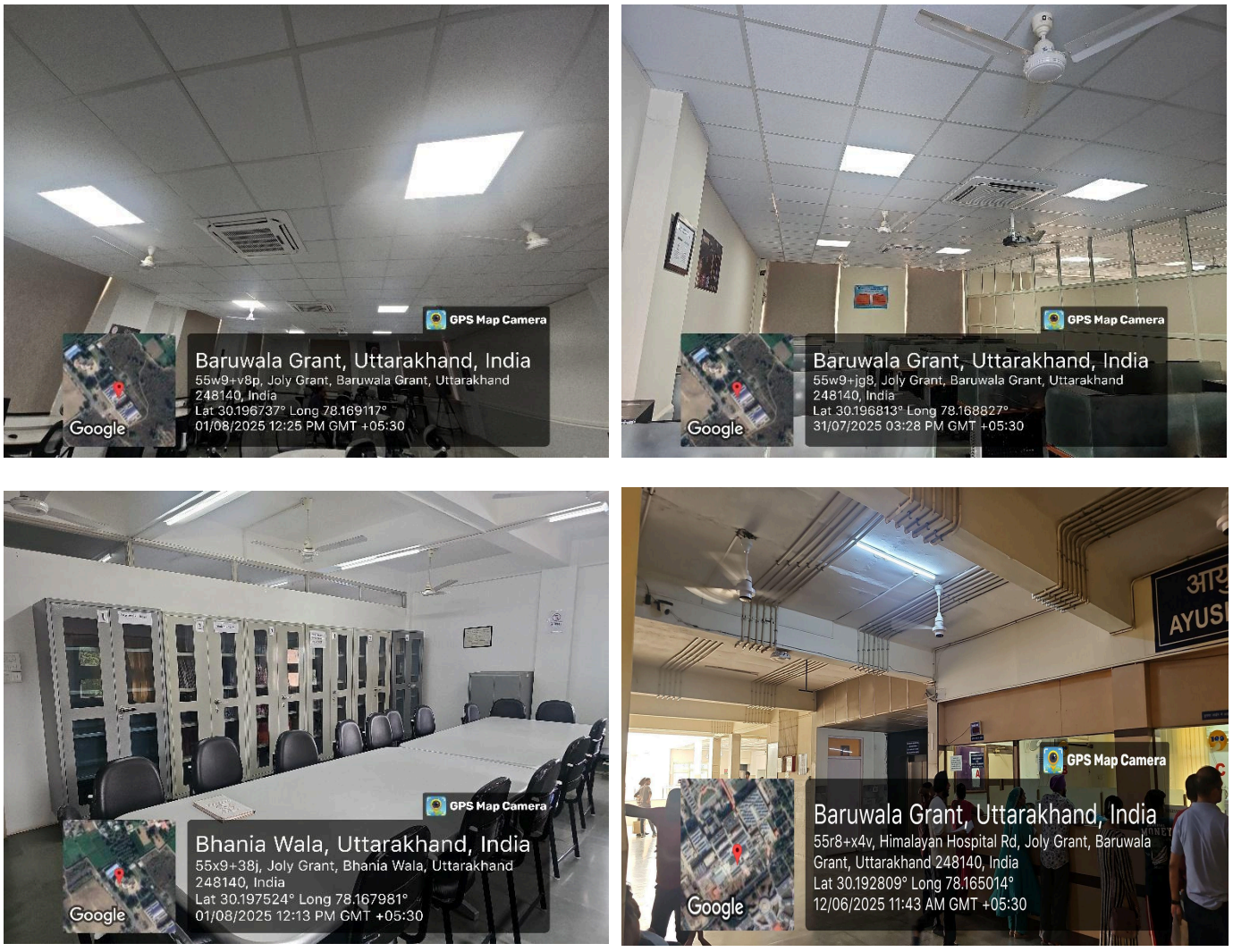
Aerial view of Biogas Plant at SRHU (Google Maps)

2. Energy Efficiency Measures

a. Use of LED bulbs/power-efficient equipments

SRHU has transitioned to LED lighting throughout its campus infrastructure, including classrooms, administrative buildings, hostels, and hospitals. This initiative aligns directly with SDG Target 7.3: *"By 2030, double the global rate of improvement in energy efficiency."* LEDs consume up to 80% less electricity than traditional lights, leading to a significant reduction in energy bills and carbon emissions. To further enhance efficiency, smart lighting systems equipped with motion sensors and automated controls have been installed in

select areas. These systems ensure that lights are only activated when spaces are occupied, thereby preventing energy wastage.

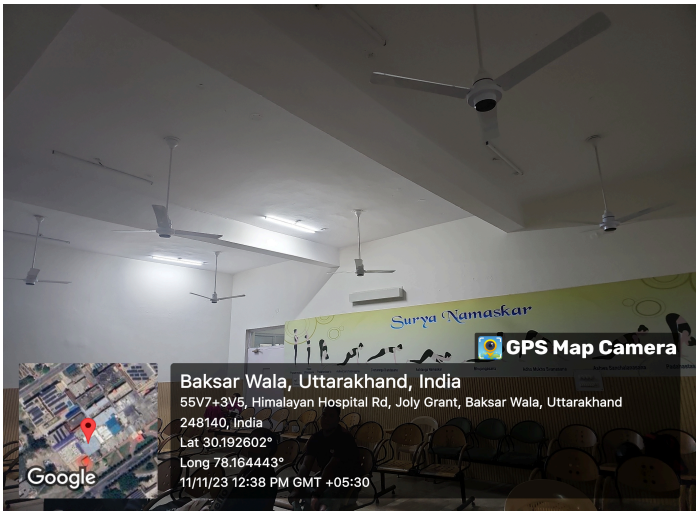


LED lighting at the University office as a step promoting energy efficiency

Implementation of LED lighting at the University as a step promoting energy efficiency

The University has replaced 2,000 conventional 70-watt ceiling fans with energy-efficient 32-watt Brushless Direct Current (BLDC) fans. This major upgrade has resulted in estimated annual energy savings of 3,04,608 kWh, based on 8 months of use for 20 hours per day. BLDC fans also offer several advantages including lower operating costs, better airflow, reduced noise, longer lifespan, and minimal maintenance needs, aligning with SRHU's green campus goals (SDG Target 7.3).

Energy-efficient BLDC (Brushless Direct Current) fans within hospital premises to enhance energy conservation



BLDC Fans at Radiology Waiting Area

BLDC Fans at Obstetric ward, Himalayan Hospital

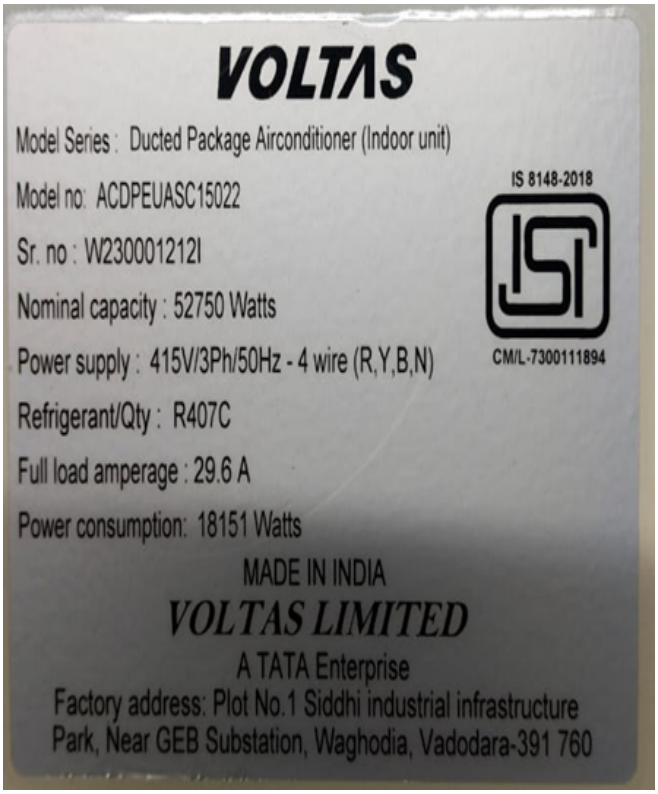
SRHU has installed over 800 split inverter air conditioners, all rated by the Bureau of Energy Efficiency (BEE). These AC units are capable of achieving 20–45% energy savings compared to conventional models. By using inverter technology, they adjust cooling output based on room conditions, which improves energy performance and occupant comfort across hostels, classrooms, and healthcare areas.

Energy Efficient split inverter air conditioners

The University's centralized HVAC system aligns with SDG 7.3 by incorporating Variable Frequency Drive (VFD) pumps in water-cooled chillers, which dynamically adjust motor speed based on demand, reducing power consumption. A heat recovery wheel recaptures up to 85% of return air temperature, contributing to thermal efficiency. Additionally, Mechanical Ventilation with Heat Recovery (MVHR) systems are employed to reduce load on air conditioners, achieving 25–50% energy savings. Variable Refrigerant Volume (VRV) systems installed in outpatient departments (OPDs) further enhance localized climate control with optimal energy use.

In a notable HVAC upgrade, SRHU replaced a 378 TR AC package unit with a BEE star-rated unit using the eco-friendly refrigerant R-407. The new unit has an Energy Efficiency Ratio (EER) of 0.88 kW/TR, reducing the campus electrical load by 102.06 kW and achieving annual savings of 44,702 kWh, assuming 12 hours of daily operation.

HVAC system installed in the University to optimize thermal comfort, reduce energy consumption



BEE star rated energy efficient AC package unit supporting HVAC system

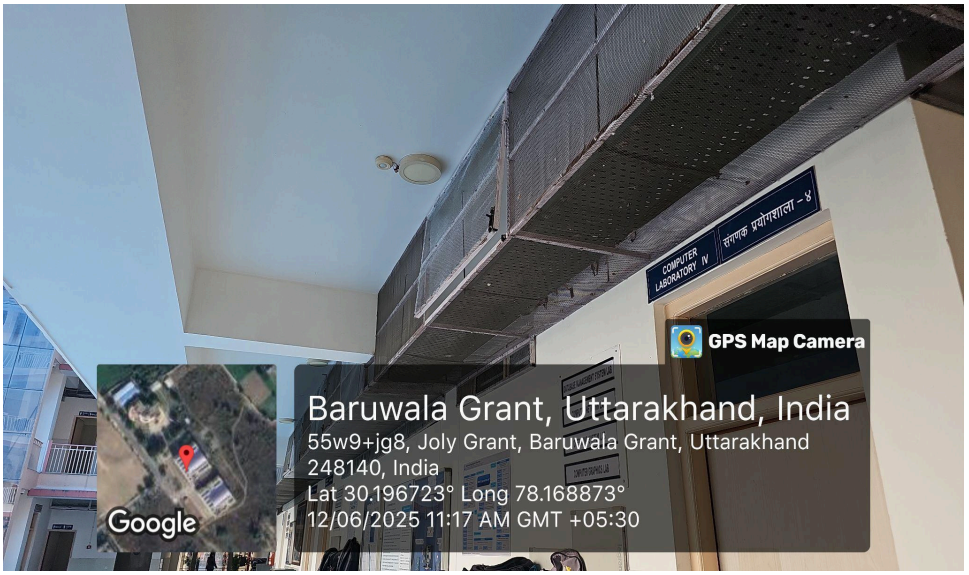
SRHU operates nine diesel generator sets of 500 KVA each, serving as backup power for critical facilities. These DG sets are fully CPCB-compliant in terms of emissions, noise levels, and stack height. Equipped with Automatic Mains Failure (AMF) panels and load synchronization systems, they operate based on actual demand, reducing unnecessary fuel use. In 2024–25, the DGs contributed 2.59% of the university's total power demand, with all emissions tested biannually in NABL-accredited laboratories and found within permissible limits.

9 Diesel generator sets with Automatic Mains Failure panels and load synchronization system

b. Sensor-Based Energy Conservation

SRHU is actively promoting energy conservation across its campus through the adoption of smart and efficient technologies. To optimize electricity usage, Passive Infrared (PIR) sensors have been installed at select locations within the University. These sensors detect infrared radiation emitted by moving objects, such as people, and automatically switch on the lights when motion is detected, thereby minimizing unnecessary energy consumption.

In addition, the University has implemented advanced automation systems in its power backup infrastructure.



Motion based sensor lights at the Engineering college building

Motion based sensor lights at the Block 5, Boys Hostel, SRHU

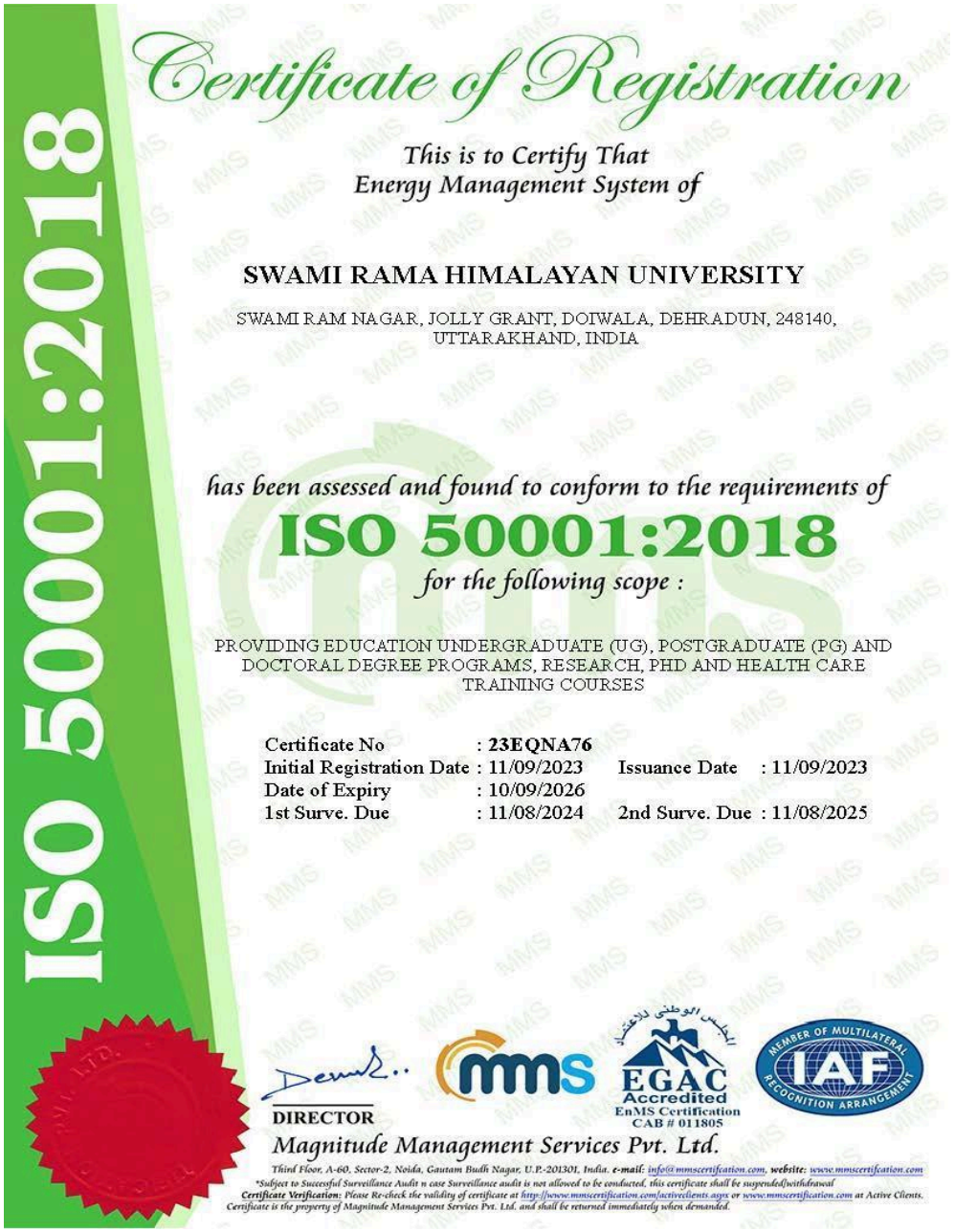
c. ISO 50001:2018 Energy Management System

SRHU has been awarded the ISO 50001:2018 certification for its Energy Management System (EnMS), reinforcing its structured and data-driven approach to energy efficiency. This international standard provides a proven framework for organizations to develop and implement policies for more efficient energy use, continually improve energy performance, and reduce environmental impact.

The certification aligns directly with SDG Target 7.3: “By 2030, double the global rate of improvement in energy efficiency,” and demonstrates SRHU’s commitment to:

- Establishing a comprehensive energy management policy
- Setting and tracking energy performance indicators
- Conducting internal audits and reviews for continuous improvement
- Reducing energy consumption and greenhouse gas emissions

The ISO 50001:2018 framework supports many of SRHU’s ongoing initiatives—such as LED retrofitting, BLDC fan replacements, solar power generation, HVAC upgrades, smart automation, and DG load optimization—ensuring that they are not just standalone projects but part of an institutionalized energy strategy. By integrating ISO 50001:2018 into its campus operations, SRHU has institutionalized energy responsibility and accountability, further validating its leadership in achieving the goals of SDG 7



Certificate of Registration

This is to Certify That
Energy Management System of

SWAMI RAMA HIMALAYAN UNIVERSITY

SWAMI RAM NAGAR, JOLLY GRANT, DOIWALA, DEHRADUN, 248140, UTTARAKHAND, INDIA

has been assessed and found to conform to the requirements of

ISO 50001:2018

for the following scope :

PROVIDING EDUCATION UNDERGRADUATE (UG), POSTGRADUATE (PG) AND DOCTORAL DEGREE PROGRAMS, RESEARCH, PHD AND HEALTH CARE TRAINING COURSES

Certificate No : 23EQNA76
Initial Registration Date : 11/09/2023 Issuance Date : 11/09/2023
Date of Expiry : 10/09/2026
1st Surve. Due : 11/08/2024 2nd Surve. Due : 11/08/2025

ISO 50001:2018

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ISO 50001:2018 certification for Energy Management System (EnMS), awarded to SRHU

d. Research and Projects Supporting SDG 7

In pursuit of Sustainable Development Goal 7 — ensuring access to affordable, reliable, sustainable, and modern energy — the University has actively contributed to research that addresses energy efficiency, renewable energy integration, waste-to-energy technologies, and sustainable materials. A selection of recent scholarly publications (2024-2025) reflects the University's multidisciplinary approach to advancing clean energy solutions:

SN	PUBLICATION TITLE	DOI
1.	Advancements in energy storage applications: harnessing the potential of fish industry waste	10.1007/s43939-024-00161-y
2.	Analysis of Smart City Solutions for Sustainable Urban Growth in India	10.1109/CE2CT64011.2025.10939348
3.	Design expert based optimization of the pyrolysis process for the production of cattle dung bio-oil and properties characterization	10.1038/s41598-024-57843-z
4.	Correction to: Advancements in energy storage applications: harnessing the potential of fish industry waste	10.1007/s43939-025-00187-w
5.	Synthesis and characterization of sustainable hybrid bio-nanocomposite of starch and polypropylene for electrical engineering applications	10.1515/jmbm-2025-0038
6.	Green Synthesis of Al2O3 Nanoparticles from Agro-Waste as a Sustainable Approach	10.1109/HISET61796.2024.00045
7.	Numerical analysis of the return flow solar air heater (RF-SAH) with assimilation of V-type artificial roughness	10.1016/j.enbenv.2022.09.002
8.	Node MCU and Lily Pad based Relay Protection System For Laboratory Micro-Grid	10.1109/ICSD60021.2024.10751602
9.	An overview of renewable energy sources: technologies, applications and role of artificial intelligence	10.1016/B978-0-443-28947-7.00001-X