

SWAMI RAMA HIMALAYAN UNIVERSITY

PLAN FOR UPGRADING EXISTING BUILDINGS TO HIGHER ENERGY EFFICIENCY

Year of Plan: 2023

Swami Ram Nagar, Jolly Grant, Dehradun – 248016, Uttarakhand, India

1. Preamble

Swami Rama Himalayan University (SRHU) recognises the importance of efficient energy use as an integral component of sustainable campus development. Improving the energy performance of existing buildings can contribute to responsible resource use, reduction of avoidable energy consumption and improved operational efficiency across the University.

SRHU has incorporated energy conservation and energy efficiency within its institutional framework. The University's Policy for Energy Conservation, originally approved in 2019, was reviewed and revised by the Board of Management on 29 March 2022 and notified on 5 April 2022. The Policy provides a framework for energy conservation across academic and administrative buildings, healthcare facilities, hostels and residences, laboratories, research facilities and common utilities.

The University's Climate Action Plan 2022–2030 also identifies improvement in energy efficiency as a strategic climate action area and provides for energy-efficient lighting, HVAC systems, appliances and laboratory equipment, smart controls and sensors, energy monitoring, periodic energy audits and energy-conservation practices.

Accordingly, this Plan for Upgrading Existing Buildings to Higher Energy Efficiency provides a framework for progressively assessing and improving the energy performance of existing buildings and associated systems at SRHU. The Plan emphasises feasible technological and operational measures, energy monitoring, maintenance, energy audits and incorporation of energy-efficiency considerations into renovation and upgradation activities.

2. Vision

To progressively improve the energy efficiency of existing SRHU buildings through energy-efficient systems and equipment, improved building operation and maintenance, energy monitoring, periodic assessment and responsible use of energy resources.

3. Objectives

1. Improve the energy efficiency of existing academic, administrative, healthcare, residential and other University facilities.
2. Identify opportunities for reducing avoidable energy consumption through energy audits, monitoring and assessment of major energy-consuming systems.
3. Promote energy-efficient lighting, HVAC systems, appliances, laboratory equipment and other electrical systems.
4. Promote the use of natural daylight and ventilation and other appropriate passive measures wherever feasible.
5. Strengthen energy monitoring and maintenance practices for building-related energy systems.
6. Incorporate energy-efficiency considerations into renovation and upgradation of existing buildings.
7. Promote responsible energy-use practices among faculty, staff and students.
8. Use energy-audit findings and energy-consumption information to identify and prioritise further energy-efficiency measures.

4. Strategic Areas for Building Energy Efficiency

4.1 Energy Assessment and Auditing

SRHU will use periodic energy audits and available energy-consumption information to identify areas of inefficient energy use and opportunities for improvement.

The assessment will consider, as relevant:

- Electricity consumption;
- Major electrical loads;
- Lighting systems;
- HVAC and cooling systems;
- Electrical equipment;
- Laboratory equipment;
- Building-related energy-use practices;
- Opportunities for energy-efficiency improvements.

Energy audits will also support identification and prioritisation of measures for existing buildings and major renovation activities.

4.2 Energy-Efficient Lighting

The University will promote energy-efficient lighting in existing buildings through:

- Progressive use of LED lighting;
- Replacement of inefficient lighting systems during routine replacement and upgradation;
- Use of daylight wherever practicable;
- Appropriate lighting controls and motion sensors where feasible;
- Switching off lighting in unoccupied spaces.

4.3 HVAC and Cooling Systems

Energy efficiency of cooling and HVAC systems will be addressed through:

- Appropriate operation and regulation of HVAC systems;
- Preventive maintenance;
- Replacement or upgradation of inefficient systems when required;
- Consideration of energy-efficient equipment's during replacement;
- Appropriate temperature management.
- Use of occupancy or automated controls where feasible.

4.4 Building Operation and Passive Energy-Efficiency Measures

Existing buildings will be reviewed for opportunities to reduce energy demand through appropriate operational and passive measures, including:

- Use of natural daylight;
- Use of natural ventilation wherever appropriate;
- Appropriate management of doors and windows in conditioned spaces;
- Reduction of unnecessary lighting and equipment operation;
- Consideration of insulation and other passive measures during suitable renovation works;
- Improvement of building operation and maintenance practices.

4.5 Energy-Efficient Equipment and Appliances

When equipment requires replacement or upgradation, energy efficiency will be considered along with functional and operational requirements.

This will include, as applicable:

- Energy-efficient electrical BEE star rated appliances
- Energy Efficient BLDC fans and cooling equipment.
- Energy-efficient laboratory equipment.

- Energy Efficient VFD motors and pumps;
- Energy-efficient IT and office equipment;

4.6 Energy Monitoring and Metering

SRHU will strengthen monitoring of energy consumption Through Building Management System in order to identify significant energy-use areas and support evidence-based energy management.

The approach will include, where available and feasible:

- Monitoring electricity consumption;
- Reviewing consumption patterns;
- Monitoring major energy loads;
- Maintaining relevant energy records;
- Using metering information for identifying areas requiring attention;
- Reviewing energy performance periodically.

4.7 Energy Efficiency in Renovation and Upgradation

Energy efficiency will be considered when existing buildings undergo major renovation or refurbishment.

Where feasible and appropriate, renovation projects may consider:

- Energy-efficient lighting;
- Efficient HVAC and cooling systems;
- Improved daylight and ventilation;
- Insulation and other passive measures;
- Efficient electrical equipment;
- Appropriate metering;
- Integration of renewable-energy systems where technically and institutionally appropriate.

4.8 Renewable Energy Integration

Where technically and operationally appropriate, existing buildings may be assessed for integration with renewable-energy systems.

This may include consideration of:

- Rooftop solar photovoltaic systems;
- Solar water-heating systems;
- Other appropriate clean-energy technologies.

4.9 Maintenance of Energy-Using Systems

Proper maintenance of energy-consuming systems will be promoted to support efficient operation and minimise avoidable energy losses.

Relevant maintenance activities may include:

- Routine inspection;
- Preventive maintenance;
- Cleaning and servicing;
- Calibration and performance checks where applicable;
- Timely corrective maintenance;
- Maintenance documentation.

4.10 Awareness and Responsible Energy Use

Energy efficiency will also be supported through responsible energy-use practices by University stakeholders.

The University will promote:

- Switching off unused lights, fans and appliances;
- Responsible use of air-conditioning and other high-energy equipment;
- Awareness regarding energy conservation;
- Participation of students, faculty and staff in energy-conservation activities;
- Communication of appropriate energy-saving practices.

5. Implementation Framework

The Plan will be implemented progressively in accordance with institutional requirements, technical feasibility, available resources and the findings of energy assessments and audits.

5.1 Identification - Existing buildings and significant energy-consuming systems will be identified for assessment based on available energy-consumption information, operational requirements and audit findings.

5.2 Assessment - Energy performance and potential areas for improvement will be assessed through available records, energy audits and technical assessment.

5.3 Prioritization - Energy-efficiency measures will be prioritised according to identified energy-saving opportunities, technical feasibility, operational requirements, maintenance requirements, suitability for the building or facility, and institutional resource considerations.

5.4 Implementation - Feasible measures will be incorporated progressively through routine maintenance, equipment replacement, renovation, refurbishment or other appropriate institutional processes.

5.5 Monitoring - Energy consumption and relevant energy-efficiency measures will be monitored periodically to assess progress and identify further opportunities for improvement.

6. Phased Implementation Timeline (10 Years)

Phase	Duration	Key Activities
Phase I	2023 & 2024	Campus-wide assessment of existing buildings; energy audits; identification of major energy-consuming systems; progressive LED replacement; strengthening of energy records and monitoring; awareness and responsible energy-use practices.
Phase II	2025 & 2026	Upgradation of inefficient HVAC and cooling systems; preventive maintenance; energy-efficient appliances and equipment during replacement; installation/strengthening of appropriate metering and controls.
Phase III	2027 & 2028	Integration of energy-efficiency measures into renovation and refurbishment projects; improvement of daylight and natural ventilation; insulation and other feasible passive measures; expansion of building-level energy monitoring.
Phase IV	2029 & 2030	Assessment and progressive integration of rooftop solar PV and solar water-heating systems where technically and operationally appropriate; optimisation of major energy loads; continued equipment and system upgrades.
Phase V	2031 & 2032	Review of building energy performance; further upgrades based on energy-audit findings; strengthening of energy monitoring and maintenance systems; consolidation of renewable-energy integration and continuous improvement measures.

7. Roles and Responsibilities

7.1 Electrical and Maintenance Function - The concerned Electrical and Maintenance function will support maintenance of electrical and energy-using systems; implementation of feasible energy-efficiency measures; identification of energy-related operational issues; energy monitoring and maintenance records; and implementation of recommendations arising from relevant technical assessments.

7.2 Civil Engineering Function - The concerned Civil Engineering function will support consideration of energy efficiency during building renovation and upgradation; incorporation of appropriate passive measures; coordination of energy-efficiency requirements in relevant infrastructure works; and consideration of energy audits before major renovation projects, as provided in the Energy Conservation Policy.

7.3 University Departments and Units - Academic, administrative, healthcare, residential and other relevant units will support responsible energy use; cooperation with energy audits and assessments; implementation of applicable energy-saving practices; and maintenance of relevant records.

7.4 Faculty, Staff and Students - Faculty, staff and students will contribute through responsible use of electricity and equipment and participation in energy-conservation awareness activities.

8. Implementation and Monitoring Framework

Action Area	Key Indicator	Monitoring
Building Energy Assessment	Buildings/systems assessed through available energy records or audits	Periodic
Energy Efficiency	Energy-efficiency measures identified and implemented	Periodic
Lighting	Energy-efficient lighting measures	Periodic
HVAC and Cooling	Efficiency and maintenance measures	Periodic
Equipment	Energy-efficient equipment considered during replacement/upgradation	Periodic
Energy Monitoring	Electricity consumption and relevant energy-use records	Periodic/Annual
Renovation	Energy-efficiency considerations incorporated in relevant renovation works	As applicable
Renewable Energy	Renewable-energy systems associated with buildings, where applicable	Annual
Maintenance	Preventive/corrective maintenance records	Periodic
Awareness	Energy-conservation awareness activities	Annual/As applicable

9. Documentation and Evidence

Progress under this Plan will be documented, where applicable, through:

- Energy audit reports;
- Electricity-consumption records;
- Building or facility-level energy records, where available;

- Records of energy-efficiency measures;
- Renovation and maintenance records;
- Equipment replacement records;
- Relevant procurement records;
- Photographs and activity records;
- Meeting or review records;
- Sustainability and SDG reports.

10. Public Disclosure

To support transparency and stakeholder access, relevant information relating to the University's energy-efficiency initiatives, policies, audits and sustainability performance may be made available through the University's official website and institutional sustainability reporting mechanisms.

11. Review and Continuous Improvement

The Plan will be reviewed periodically in conjunction with the University's energy-conservation framework, energy audits, infrastructure requirements and institutional sustainability mechanisms.

The review may consider:

- Findings of energy audits;
- Energy-consumption patterns;
- Technological developments;
- Building renovation requirements;
- Operational experience;
- Applicable regulatory requirements;
- Opportunities for further improvement.

Any future targets or measures will be considered subject to institutional review, technical feasibility and available resources.

12. Institutional Commitment

Swami Rama Himalayan University is committed to progressively improving the energy efficiency of its existing buildings through responsible energy management, energy-efficient systems and equipment, appropriate building operation and maintenance, energy monitoring, periodic assessment and feasible improvements during renovation and upgradation.

The University will continue to use institutional policies, energy audits and documented evidence to identify opportunities for improving building energy performance and to support efficient and responsible use of energy across its campus.