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# ENERGY POLICY

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2019



**Centre of Excellence in Energy Science and Technology**

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Web Link : [shooliniuniversity.com/center-of-excellence-in-energy-science-and-technology](http://shooliniuniversity.com/center-of-excellence-in-energy-science-and-technology)

# Energy Policy of Shoolini University

## 1. Preamble

Shoolini University is committed to United Nations Sustainable Development Goals (SDG) through its innovative energy policy to make Shoolini University a sustainable, energy efficient green campus. This energy policy applies to all operations and activities of the University including building construction, renovation, transportation, and any other operations for improving energy efficiency through the installation of energy efficient systems and use of renewable energy sources. The environment protection, efficient water management and fossil fuel use reduction in various activities undertaken by the University are the linked aspects of this policy. The various measures are to be undertaken for the divestment of energy consuming, and fossil fuel based existing equipment/vehicles etc., with innovative energy efficient systems and to invest in Climate Change solutions for a Carbon Neutral University Campus by 2025.

## 2. Policy Goals

- To take measures to reduce greenhouse gas emissions to make Shoolini University as Carbon neutral Campus by 2025.
- To design and construct all the new buildings by incorporating energy efficient , solar passive building ,water conserving and environment friendly building technologies .
- To discourage the fossil fuel-based power generation by utilizing renewable energy sources, solar roof-top PV /hybrid systems, waste to energy generation, to meet the energy requirements of the University.
- Measures will be taken to use solar water heating systems, solar steam cooking systems, in university hostels to save LPG and other conventional fuels.
- To take necessary steps to regulate public transportation inside the campus and, and to utilize electric vehicles inside the campus for essential transportation.

### **3. Applicability**

This policy shall apply to all departments/extensions of Shoolini University and villages around the campus as well as students, employees, faculty who'd be encouraged to take initiatives for fulfilment of the policy objectives.

### **4. Implementation Strategy:**

The Energy policy will be implemented through following immediate measures:

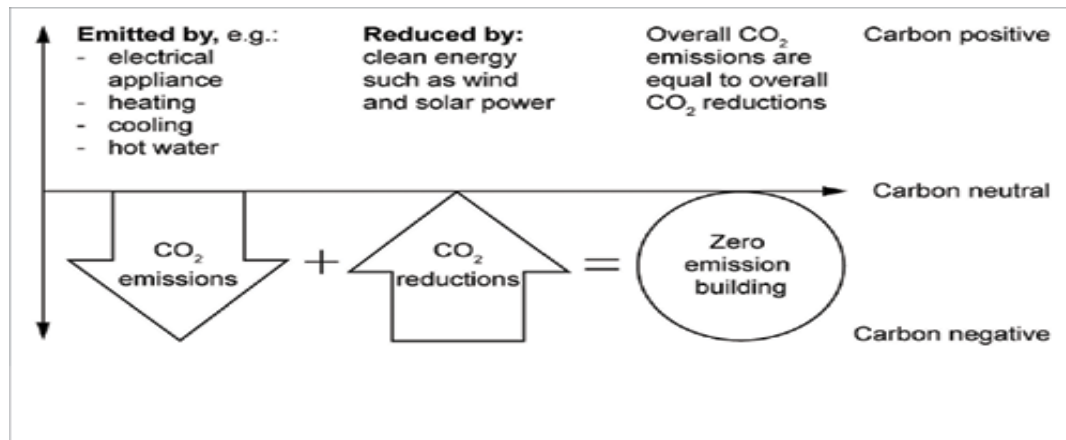
#### **4.1 Policy on Energy Efficient Passive Solar Buildings for Zero Carbon Emission**

**4.1.1.** Under UN Sustainable Development Goal No.7 on Energy & 13 Climate Change decreasing the rate of increase in the concentration of atmospheric CO<sub>2</sub> can be achieved by reducing the use of fossil fuels to remove CO<sub>2</sub> in building sector which consumes about 40% of the energy. Creating carbon neutral buildings cost effectively takes carefully planned applications including affordability, Passive solar heating, Passive cooling, and Energy efficient Hot water systems; Heating and cooling; Renewable energy; Smart meters, etc. through following initiatives:

#### **4.1.2 Overall approach to carbon neutrality in buildings:**

**Zero carbon** buildings are defined as having no net annual emissions from direct fuel combustion (e.g., burning natural gas) and electricity use from operation of building incorporated services.

- Building incorporated services include all energy demands or sources that are part of the building fabric at the time of delivery, such as the thermal envelope (and associated heating and cooling demand), water heater, built-in cooking appliances, fixed lighting, and shared infra-structure and renewable energy generation.
- Zero carbon buildings must meet specified standards for energy efficiency and on-site generation.



**Fig. 1 Policy Initiative :Creating zero carbon and carbon positive buildings**

Carbon positive moves beyond zero carbon by making or ‘net export’ contributions by producing more energy on site than the building requires and feeding it back to the grid (Net Metering PV Concept). Carbon positive projects can make significant contributions by helping to address the carbon intensity and damaging impacts of past building practices and lifestyles, and by offsetting situations where carbon zero homes are not possible. While zero carbon is considered to be today’s benchmark of best practice, carbon positive buildings will play an increasingly important role in the future to limit global warming.

#### **4.1.3. Solar Passive Policy Co-ordination & Implementation Guidelines**

Statement, Strategy & Guidelines

- *Shoolini University makes it mandatory to design and construct all the buildings in its campus as per passive solar architecture and incorporating energy efficient building technologies following the Solar House Action Plan & Policy adopted in the State of Himachal Pradesh.*
- *The feasibility of existing buildings for retrofitting of Passive Solar features/systems for improving energy efficiency and reducing energy consumption will be explored for urgent follow up action.*

## **Co-ordination & Implementation Guidelines**

- i. The Centre of Excellence in Energy Science & Technology (CEEST), established in 2019 at the Shoolini University will co-ordinate the Solar Building Action Plan for Shoolini University.
- ii. A technical Project Management Cell (TPMC) has been established in the CEEST with Director (Energy) as the Principal Coordinator along with expert team in solar building design, renewable technology analysis, Director (Estate) & building maintenance in charge with concerned architect, civil/electrical engineer team for the construction implementation and maintenance.
- iii. A Computer Aided Solar Passive Design Cell with architect, design engineer [structural], executive engineer, a Computer programmer well versed in building design software, Autocad, seismic analysis software, along with Solar radiation data & building performance monitoring, forecasting load analysis using Artificial Intelligence techniques will be established.
- iv. The constructed buildings will be live laboratories for energy education, research and development for CEEST.
- v. Systematic efforts will be made by CEEST to orient & train University's technical. Architecture and engineering sections for adopting the innovative technologies.
- vi. The CEEST will also promote the technology around nearby villages to help design their houses as social obligation to the communities along with providing technology inputs for the State of Himachal Pradesh Housing Agencies for effective implementation & Policy formulation.

### **4.1.4 Creating Zero Carbon Buildings in and around Shoolini University campus for communities**

- Zero carbon buildings require that all carbon emissions be offset by passive solar design of buildings, reduction in conventional electricity consumption through on-site renewable energy generation by installation of rooftop solar or other renewable energy systems, as well as energy generation from waste.

- Incorporating energy efficiency strategies with renewable energy options
- Choosing a site that allows for renewable energy generation, passive solar heating and cooling
- Maximizing passive design strategies in the design of the building to reduce energy demand
- Reducing water use - particularly hot water -adopting Rainwater harvesting
- Identifying appropriate materials that enhance the passive design strategy and have a low embodied energy.

#### **4.1.5 Setting targets for Zero Carbon Buildings: Improving energy efficiency**

Maximizing energy efficiency significantly reduces the amount of renewable energy required to meet the energy needs without carbon emissions. This improves viability at three levels:

- Physical - reduces roof surface area requirements for PV and other renewable energy systems
- Economic - needs a smaller capacity system.
- Environmental -uses few resources to manufacture system components.

#### **4.2. Implementation and Promotion of Renewable Energy Technology and Energy Efficiencies**

Shoolini University pledged to implement 100% renewable energy to meet the electricity demand and other energy uses by the year 2025. This can be achieved through the following action plans:

- Installation of solar PV on grid and standalone power generation system in the university premises
- Installation of solar water heating systems in the university premises
- Installation of CST based community and building integrated cooking system
- Installation of Solar Street light in the university campus

- Installation of Bio gas plants to generate power from the bio residues like kitchen waste or other waste generated in the campus premises. Focus will be given to implementation of Biomass Gasification, Pyrolysis, and Digester in the campus.
- Installation all energy efficient electrical or electronic devices/equipment/masonries in other to save energy-in the campus.

#### **4.3. Implementation and promotion of electric vehicles in the university campus**

- Measures to reduce vehicular pollution in the Campus. Restriction of heavy vehicles inside the campus during day time. For night movement of heavy vehicles necessary permission required from the competent authority.
- Promotion of shared Cab/Taxi and personal cars during office hours. Encourages to use public transport
- Promotion of electric vehicles/Cart in the university campus or not allowed to buy 1200 CC above car for official uses.

#### **4.4 Green Campus**

- Initiations of regular tree plantation in the campus and surrounding area for CO<sub>2</sub> emission reduction
- Initiations of put bamboo based and regular waste collection dustbin in the university campus
- Implementation of waste recycling and treatment plant

### **Review**

The Energy policy will be reviewed from time to time and updated whenever required.