Centre of Excellence in Energy Science and Technology

Focus of Centre:

SDG 7: Affordable and Clean Energy, SDG 9: Industry, Innovation and Infrastructure SDG 11: Sustainable Cities and Communities, SDG 12: Responsible Consumption and Production and SDG 13: Climate Action

Vision

To achieve excellence in research and technology development in the area of sustainable energy

Mission

- To provide multidisciplinary education, research & development solutions with a focus on clean and sustainable energy sources.
- To identify energy, environmental and climate change concerns & policy issues to provide local and global solutions mainly focussed on the Himalayan Region.
- To carry out detailed energy resource assessment with a focus on solar, wind, biomass and other clean technology applications for improving the living conditions of people.
- To promote energy education, environmental awareness, entrepreneurship development and National & International collaboration for technology development and transfer.
- To provide high-quality trained professionals for the Institutions/Energy Industry in the country and worldwide.

Location: Block E

Year of Establishment: 2019

Faculty In-charge: Prof. S.S. Chandel

No. of Publications in following SDGs (2018-2023):

Name of SDG	No. of Publications
SDG 7: Affordable and Clean Energy	261
SDG 9: Industry, Innovation and Infrastructure	116
SDG 11: Sustainable Cities and Communities	31
SDG 12: Responsible Consumption and Production	79
SDG 13: Climate Action	81

Extracted from Scopus database

The multi-disciplinary Centre of Excellence in Energy Science and Technology (CEEST) was established at Shoolini University in 2019 under the Faculty of Engineering and Technology. The Centre, ranked 12th in India in Energy as per SCIMAGO Institutional Rankings 2021, offers M. Tech. (Energy Technology) & Ph.D. in Energy. Within just two years of its inception, the Centre has already established sustainable linkages with National and International Institutions and Industry for research, education, and technology transfer. It boasts of a highly specialized faculty in various disciplines of Energy with well-equipped laboratories for teaching, R&D, and consultancy.

The major task of the Centre is to develop comprehensive innovative and sustainable solutions to various energy and environmental challenges through leadership projects. This involves promoting energy efficiency and adoption of clean energy, geothermal, and renewable energy sources like solar, wind, hydro, and biomass, etc., to meet the energy needs and consider various renewable energy policies at the local, regional, and national levels.

Thrust areas of research

Solar photovoltaics | Solar Thermal | Concentrated Solar Power | Solar PV power generation |Micro Grid |Smart grid Power | Wind | Wind resource Assessment| Solar Wind based hybrid Systems | Energy Storage Systems Pump Hydro |Battery research: Electrical Vehicle applications| Geothermal | Passive Solar Building Technology | Thermal comfort | Net-zero Energy Buildings | Green Building Rating, Policies | Ocean | Tidal | Fuel Cells | Bio-Energy | Bio-fuels | Hydrogen Energy | Energy & Environment related research & Policy Issues | Artificial Intelligence: Machine learning Applications for Renewable Energy | Smart Grid | Energy Management Systems | Renewable Energy Source assessment, Integration | Energy Storage Systems | Electrical Grid | Stability | Renewable Power Penetration in Grid | etc,

Collaboration

Linkages with International Institutions & Organizations

- International Collaboration in Research with University of New South Wales (UNSW), Sydney, Australia in Passive Solar Building Technology, Built Environment & Renewable Energy
- A MOU has been signed by the University with Fitchburg State University Fitchburg, USA Feb20 2020 for promoting Education & Training in Energy.
- Collaboration of CEEST with Renewable Energy Research has been initiated with the University of Exeter UK

Collaboration with National Institutions

- NTPC Energy Technology Research Alliance,
- National Institute of Solar Energy (NISE),
- Ministry of New & Renewable Energy - Government of India
- Indian Institutes of Technology
- National Institute of Technology for R&D and training.
- Shoolini University is approved as a Host Institution by the Ministry of Small and Medium Enterprises (MSME), Govt of India. A Project for Entrepreneur Development & start Ups has been approved

Resources Available

400kWp grid-connected Solar Photovoltaic Power Plant at Shoolini University

Concentrated Solar Power Steam Cooking System for 500 at Girls Hostel, Shoolini University, Solan, Himachal Pradesh

Solar thermal panels for hot water supply of the campus

Research Projects

Title	PI & CO-PI	Date of submission	Organization	Status
Development of Innovative Energy Efficient Passive Solar Home Stay Business Enterprises for Eco-Tourism Promotion and Socio-Economic Upliftment of SC Communities - A Science & Technology Innovation Hub at Shoolini University, Himachal Pradesh	Dr. Ruhit Jyoti Konwar, Prof. S.S.Chandel, Rahul Chandel, Ankit Shukla, Subodh Saurabh Singh	September 23 2021	DST	under process
Skin cancer diagnoses device using machine learning techniques	Dr. Sonia, Prof. S.S.Chandel & Salwan Tajjour	March 15, 2021	BIRAC	under process
Cost effective Water Purifier	Ishan . Biotechnology	Jan 5 2020	MSME	under process
Getreal-A new cost effective, portable device for real time monitoring of DNA and RNA	Kartik Chauhan - Biotechnology	Jan 5 2020	MSME	under process

Magnokits: microplastics removal from waste water; Increasing water potability	Ajay Kumar - Pharmacy	Jan 5 2020	MSME	under process
A cost effective Kalonji based Nano-herbal formulation for Psoriasis treatment	Samar Vihal - Biotechnology	Jan 5 2020	MSME	under process
Natural Temperate Fruit Vinegars from western Himalayan Region-A Supernatural Health potion	Naushad -Food Technology	Jan 5 2020	MSME	under process
Rayansh-A new Equipment for Essential Oil Extraction from Aromatic and Herbal Plants	Mr. Ankush Chauhan-Physics	Jan 5 2020	MSME	under process
Thermo-Solis –a modular system with thermal storage for space heating of buildings in cold Regions	Elixir Energy Private Ltd, Shimla -Solar	Jan 5 2020	MSME	under process
Protek DG: Cost effective solution for maximizing solar power utilization and minimizing fuel consumption	Holomium Technology, Noida-Electronics	Jan 5 2020	MSME	under process
Probiotic Rich Spices	Yogesh Sharma-Biotechnology	Jan 5 2020	MSME	under process
Micro-Algae Powered Air Purifier	Microalgae Develop Private Ltd New Delhi-Biotechnology	Jan 5 2020	MSME	under process

Patents Filed

S.No	Title	Inventors	Patent filing number	Date of filing

1	Controlled lazer heating system (clhs)	Rahul Chandel, Sham Singh Chandel, Ram Parkash Diwvedi	341090-001	March 19, 2021
2	Portable water heating solar collector (pwhsc)	Rahul Chandel, Sham Singh Chandel, Ram Parkash Diwvedi	341089-001	March 19, 2021
3	Solar Water Purifier	Sunil Kumar, Sushil Kumar, Sonia Kumari, Sakshi Guleria, Robin Thkur, Naresh Kumar, Akash Sharma	338521-001	February 03, 2021
4	Solar power assisted distillation plant and method of use thereof.	ADIT RANA, KAMAL DEV, RAJ KUMAR, SHAM SINGH CHANDEL, NIDHI KAPOOR, ANURADHA SOURIRAJAN.	202011034249	August 10, 2020
5	Solar Tiller	Sushil Kumar, Praveen Kumar, Nikhil Sharma, Rohit, Shubham Prakash, Satyam Singh	327715	March 01, 2020
22	A single platform multi-temperature solar powered orbital shaker incubator for growing microorganisms at different temperature and method of use thereof	Adit Rana, Prof Kamal Dev, Dr. Raj Kumar, Prof. (Dr.) Sham Singh Chandel, Nidhi Kapoor, Prof. Anuradha Sourirajan	201911039615	September 30, 2019
6	Nanofluid flow heat exchanger	Lohit Sharma, Anil Kumar, Robin Thakur, Sunil Kumar	322069	September 26, 2019

7	Solar Water Heater	Robin Thakur, Amar Raj Singh Suri, Sunil Kumar	317839	May 19, 2019
8	Solar Water Heater	Rajesh Kumar, Anil Kumar, Robin Thakur, Amar Raj Singh Suri	317840	May 19, 2019
9	Fresnel Lens Solar Water Heater	Robin Thakur, Sunil Kumar	317417	May 02, 2019
10	Solar Water Heater	Mr. Shubham Verma, Dr. Anil Kumar, Mr. Sunil Kumar, Dr. Robin Thakur, Dr. Amar Raj Singh Suri	316063-001	March 26, 2019
11	Solar Energy Storage System	Mr. Sunil Kumar, Dr. Anil Kumar, Dr. Robin Thakur, Dr. Amar Raj Singh Suri	316068	March 26, 2019
12	Solar Water Heater with Storage	Dr. Anil Kumar, Dr. Robin Thakur, Mr. Sunil Kumar	316070	March 26, 2019
13	Solar Equipment to Extract Substances from Plants	Dr. Anil Kumar, Dr.Mamta Sharma, Dr. Rajesh Kumar, Dr. Robin Thakur	316069	March 26, 2019
14	Method and system for estimated efficiencies in	Anil Kumar, Robin Thakur, Sunil Kumar, Kamal Kashyap	201911005559	February 13, 2019
15	Solar-nanomaterial energy- storage	Anil Kumar, Robin Thakur, Neeraj Chandel, Sunil Kumar, Rajesh Kumar, Pankaj Thakur	313480	December 27, 2018
16	Thermo-photovoltaic system	Arvind Singhy, Robin Thakur, Anil Kumar,	312788	December 05, 2018

		Sunil Kumar, Ashwani Sharma		
17	Absorber plate of solar air heater triangular duct and uses thereof	Anil Kumar, Deshmukh Kiran Prakash Rao, Robin Thakur, Amar Raj Singh Suri, Sunil Kumar	201811038014	October 08, 2018
21	A solar cooking system based on preheated water to reduce co2 emission	Dr. Rajesh Kumar, Er Ankit Gupta, Prof Raja Sekhar Y, Prof Sham Singh Chandel	201811031068	August 20, 2018
18	Fin-solar energy-storage	Anil Kumar, Amar Raj Singh Suri, Robin Thakur, Chaduvula Narasimha Reddy, Boddu Satya Rama Sai Vithal	306244	May 23, 2018
19	Roundtube heat-exchanger	Anil Kumar, Robin Thakur, Ravi Dutt, Amar Raj Singh Suri	306245	May 23, 2018
20	Solar Tracking System.	Sorabh Aggarwal, Bhaskar Goel, Neeraj Gandotra	298908	October 30, 2017
23	Cooking Stove.	Sorabh Aggarwal, Ankit Thakur, Raj Kumar, Shashank Thapa, Bhaskar Goel	298909	October 30, 2017
24	Semi tubular solar air dryer.	Adit Rana, Ranchan Chauhan	201711019471	June 02, 2017