



SDG 7: Affordable and Clean Energy

ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

In its master plan, the Indian Institute of Technology, Gandhinagar (IITGN) incorporates sustainability into its design. IITGN is the first campus in India to be awarded a 5-star rating by Green Rating for Integrated Habitat Assessment for Large Developments (GRIHALD) in 2016.

In order to operate and maintain its buildings, the institute follows a sustainable management policy/program and/or a green building rating system. Salient features of the IITGN campus that qualifies it as a sustainable campus in terms of energy are solar energy generation, comprehensive waste management, water conservation, purification and recycling, and compost production. The campus infrastructure supports passive cooling and energy conservation in all aspects of construction, operations and management. As part of Sustainable Development Goal 7, the institute has undertaken various initiatives and activities to promote energy conservation and raise awareness on campus and in the neighbourhood.

Research

The research projects along with the names of the funding agencies are as follows:

- Intelligent Power Management System for Monitoring, Diagnosis & Prognostics of Electric Loads in Armoured Fighting Vehicles-DRDO.
- Foundation consultancy for Development of Proposed 10 GW RE (Wind and/or Solar) Projects in Great Rann of Kutch, Gujarat-NTPC.
- Understanding the impact of air pollution on solar photovoltaics and developing surface-engineered panel materials for improved performance of solar plants-MHRD.
- Developing a new plasmonic antenna-reactor platform for efficient storage of solar energy as clean fuels. - GUJCOST.
- High-yield exfoliation of layered metal diborides to synthesise boron analogues of graphene for developing a new class of energy storage nanocomposites.GUJCOST.

Besides this project work, 65 research articles have been published by IITGN faculty/research staff and students relating to SDG 7. More than 75 authors from the institute have contributed to these articles. The articles include research articles, review articles, and conference and book chapters.

The focus of research laboratories related to energy at IIT Gandhinagar includes the following laboratories-

- Power Systems and Smart Grid Lab
- Smart Manufacturing and Robotics (SMART) Lab
- Electrical Machines and Power Electronics Lab
- Energy Systems Lab

Education

SDG7 related courses offered in IITGN which deal with cleaner and more affordable energy

CE 202: Sustainability and Environment

EE 331: Electrical machines

EE 333: Power Electronics

EE 426: Electric Vehicle Technology

EE 611: Restructured Power Systems: Operation and Management

EH 302: Elements of Earth System Science

ES 103: Introduction to Electrical Systems

MSE 626: Light Metal Alloys for Automotive Industry

Community Outreach

- National Power System Conference: The 21st edition of the National Power System Conference (NPSC 2020) was hosted online by the Electrical Engineering discipline of IITGN during December 17-19, 2020. NPSC is a prestigious biennial conference that provides a forum for academia, industry, and students to present and discuss the most recent innovations, trends, experiences, and challenges in the field of electrical power and smart energy systems. The theme for NPSC 2020 was ‘Sustainable Energy and Resilient Future Grid’, which is of interest to most power utilities, practising engineers, and academics. More than 200 participants from India and abroad joined the online conference.
- India's power sector transition to 2030: Modelling and insights by Mr Raghav Pachouri, Associate Fellow, Electricity and Fuel Division, The Energy and Resources Institute (TERI) on February 22, 2021
- Large scale production of graphene for photovoltaic applications, Senior Researchers Colloquium By Dr Siva Sankar Nemala, DST-SERB postdoctoral fellow, Physics, IITGN on February 19, 2021

Operations

Sustainability Fair 2021

The third annual Sustainability Fair of Dr Kiran Patel Centre for Sustainable Development (KPCSD) at IITGN was held on March 26, 2021. Shri Vijay Rupani, Hon'ble Chief Minister of Gujarat, virtually addressed the delegates. He shared details of the Government of Gujarat's significant initiatives and policy decisions on renewable energy and water conservation including promotion of solar rooftop system that has enabled thousands of people to become energy producers instead of energy consumers, Kisan Suryodaya Yojanaya, installation of desalination plants in Mandvi and Kutch, desilting of lakes and rivers for water conservation, and e-vehicles policy.

Biogas plant and solar energy

IITGN in collaboration with BARC, has built a biogas plant, which is still operational on IITGN campus. This generates manure and electricity from food and organic waste with no other by-products. It is designed to help save 1 tonne of waste from going to landfills each day and in turn generate manure and electricity from them. In academic blocks and hostel buildings, the IITGN grid-interactive rooftop solar PV project has a current capacity of 500 kWp.

Passive Cooling Technologies

In student dining halls and classroom buildings based on evaporative downdraft cooling, night-purge-based system, and forced evaporative cooling.