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Sarvajani University

Sarvajani College of Engineering & Technology, Surat

Dr. R. K. Desai Mark, Opp. Mission Hospital,

Athwalines, Surat- 395 001

Department of Electrical Engineering

Report on

R & D Talk Series

on

Design and Simulation of Rooftop Solar PV Systems

Organised By

Dr. Shabbir S. Bohra

Professor

Department of Electrical Eng.

SCET, Surat

An Expert talk has been arranged to target the students of BTech-II, III and IV year, Faculty of Electrical Engineering, Sarvajani College of Engineering & Technology, Surat covering the details of **Design and Simulation aspects of Roof Top Solar Photovoltaic Systems**.

The Objective of the talk was to give brief idea about various soft-wares and simulation packages used commercially by EPC vendors, researchers, etc. to prepare feasibility report for given client's site.

Resource Person: Mr. Amandeep Singh Makhija,

Assistant Professor and PhD Research Scholar

Electrical Engineering Dept

Government Polytechnic, Kheda

Venue: E-204, Second Floor, SCET, Surat in ONLINE mode

Date & Time: 15th September 2023, 11:00 to 12: 30 PM

Participants: B.Tech II, III and Final Year Students – 37 Students

Brief Introduction of Speaker:

- B.Tech in Electrical Engineering from Charotar University of Science and technology (CHARUSAT) in year 2009-13.
- M.Tech in Energy Systems & Technology (Focused on Solar Energy) - Gold Medalist from PDPU, Gandhinagar in year 2013-15.
- 1.5 years of Solar designing and vendor consulting experience at Azure Power Pvt. Ltd, New Delhi in year 2015-2016. Involved in designing around 50MW Decentralized Solar Rooftop plants on various Roof profiles (approx. 500 different roofs) using various simulation & designing software.
- 6.5 years of cumulative teaching experience at Government Polytechnic, Kheda in Electrical Engineering Dept. (2016-2022) and at Government Polytechnic, Himatnagar (Feb 2022-till date)

Session Summary

The R&D Talk on “*Design and Simulation of Rooftop Solar PV Systems*” was organised by Department of Electrical Engineering, SCET, Surat. The talk commenced with welcome speech by **Dr. Shabbir S. Bohra**. He has explained importance of such knowledge for an Entrepreneur who wants to start his/her venture in the emerging field of Rooftop Solar PV systems or grabbing job opportunities in EPC companies in Solar PV Market.

Gujarat and Maharashtra are the leading states in solar rooftop additions accounting for about 40-45% of overall installed capacity. These two states accounted for 58 per cent of rooftop additions in FY23. Total installed solar power generation capacity of the Gujarat state has increased to more than **7,000 MW in 2023**. Furthermore, **Gujarat today ranks at number one, accounting for around 23% of India's solar rooftop installations**. The Solar Rooftop PV installations does not only require assembling of Solar PV systems at site on the roof of client but requires through analysis of client's location and site, civil structure available for rooftop, requirements and availability of rooftop/ground space, nearby structure for shadow analysis, regulations of local Governments and incentives/subsidies if any, etc.

Mr. Amandeep has sound knowledge of preparing feasibility report and procurement and installation of such Solar PV systems. He is a PhD research Scholar at Gujarat Technological University, Ahmedabad and working on Performance Degradation of Water Mounter Solar PV Systems.

He started with basics of our Solar systems and explained what the key aspects one has to take into account when thinking for installing Solar PV systems. He then took students to analysis of client's site, as he has chosen SCET as client's location to give students real feel of task. He explained very well how to select particular site using Google Earth Application and then he discussed Google SketchUp tool which is a premier 3D design software that truly makes 3D modelling for everyone, with a simple to learn yet robust toolset that helps to create drawing and design application. He also explained the method of carrying out shadow analysis for given site and the impact of this analysis on performance and generation of electrical power and energy. Then after, the very important part of selection of solar panels and mounting was explained. The various types of connections in terms series and parallel strings of panels were elaborated using PVSyst application software- which is widely used across the world by many EPC companies, researchers, etc. The loss analysis and types of losses taking place in such

system was briefed about in order to estimate energy generation per year and life time of installation.

At the end of session, 10 minutes were spared for any queries of students and doubts of students were addressed by Mr. Amandeep satisfactorily. The session was found to be very informative and very useful by students during their under graduation and after it as well.

We are very much thankful to Dr. Hitesh Mehta, Head-Department of Electrical Eng. SCET, Dr. Hiren Patel- our respectable Principal and Dean-Faculty of Engineering, and Dr. Utpal Pandya- Dean, Research and Development, for their support. We look forward for such support in future to conduct such session/talk for the benefit of students of SCET.

Glimpses





Compiled and Edited by
Dr. Shabbir S. Bohra