

SOLAR ENERGY LABORATORY

Solar Energy Laboratory was established in early 2017, with the help of USAID funding. Researchers of this Lab explored and developed variety of solar energy conversion devices and systems like efficient solar thermal water desalination unit, home-made soiling station for outdoor/ indoor photovoltaic module testing and lab scale third generation solar cells. This laboratory has also hosted several training workshops on photovoltaic system designing and installations. Solar Energy lab multitudes diverse arenas of solar energy research opening up new horizons for the researchers to provide solutions to renewable energy sector of Pakistan.

LAB MISSION

The main goal of Solar Energy laboratory is to educate students and researchers through research experiences in solar energy conversion, starting from basic to applied research, energy efficiency and energy auditing of buildings.

RESEARCH PORTFOLIO

Solar PV Materials, Energy Auditing, Solar Thermal Energy Systems, Thermal Energy Storage and Reliability of PV Modules



RESEARCH THEMES AND EQUIPMENT

Equipment	Description	Specification
Thin film/ coating deposition and characterization facility		
Spin Coater	Spin coating is a used to deposit uniform thin films onto flat substrates	Maximum spin speed: 13,000 RPM/s Time: 1s to 99
Contact Angle Measurement	Evaluating surface cleanliness and study adhesion, absorption, wetting behavior, and surface treatments	Measuring range: 0-180 degree Repeatability: 1°, Accuracy: 0.5° Dosing: 150-500 Droplets
Solar cell fabrication and Characterization tools		
Quantum Efficiency Measurement System	Measurement of an electrical sensitivity to light, and Quantum Efficiency.	Wavelength range : 300-1100 nm
PV Lamination Module Facility		
Solar Panel Laminator	Solar panel lamination ensures the longevity of the solar cells of a module	Laminate Length * Width: 700mm x 700mm
Energy Auditing		
Power Quality Analyzer	Troubleshoot power quality problems	IP51 according to IEC60529
Ultrasonic Flow Sensor	Measures the velocity of a fluid	Flow range: 0.07 to 39 ft/sec
Ultrasonic Leak Detector	Leak Detection Tool	Frequency response: 35 kHz to 45 kHz
Thermal Imager	Detection of temperature measurement	Infrared spectral band: 7.5 μm to 14 μm
Tachometer	Measuring the rotation speed of a shaft	Rpm: 10 to 99,999
Lux Meters	Measures brightness	Lux Range: 999.9 to 400000
Solar Resource Estimation		
Pyranometer	Measuring solar irradiance	ISO 9060:2018 classification
Albedometer	Measures global radiation	Sensitivity: 0.3 to 3 μm