Integrating Solar Electricity into the Regional Energy Mix

Knowledge of the solar resource is important for the integration of solar electricity into the regional energy mix just as stream flow data are important for hydroelectric systems. The solar radiation monitoring laboratory is working on characterizing the solar resource and understanding how the solar resource influences the performance photovoltaic systems. Basic information on the solar resource will be presented along with a discussion on how photovoltaic systems work. A PV module testing facility will be described and some results presented.

Outline

Integrating Solar Electricity into the Regional Energy Mix

Understanding the solar resource

Global, Beam, and Diffuse Irradiance

Why components

Long-term trends

Accuracy of measurements

Instrumentation book

Spectral measurements

Andrew

Performance of photovoltaic systems

System performance

Anatomy of the system

Degradation with time

Need for accuracy

Testing PV modules outdoors

NREL test facility

IV curve

Solar cells act as batteries

Economics

New technologies