

## Sandia National Laboratories Site Visit:

Tour consisted of the two sections:

Photovoltaic Systems Evaluation Laboratory  
Distributed Energy Technologies Laboratory

Tour of the facility began with a slide show presentation with overview of Photovoltaic (PV) research being performed at Sandia National Laboratories. Slides included a brief presentation of a potential micro grid installation on the Hawaiian Island of Lanai. The goal is for a 1.2MW PV array of the 5 MW total power requirements for the island. The issue of old unreliable generators and the isolation of the island are the biggest concern.

The photovoltaic systems side is all about the testing and performance of the individual photovoltaic panels. The durability is looked at as well as energy output for the panels given full sun and partial shading. Accelerated testing can be performed to simulate years of service in outdoor conditions. Nominal efficiencies of different types of panels and manufacturing processes were discussed. Testing is performed primarily on crystalline type panels. Some thin film amorphas panels are being tested too.

The distributed energy side demonstrated their scalable micro grid set up. Various energy sources including a generator set, micro turbine, a photovoltaic array, and battery storage are connected to their grid. They can simulate various load profiles representing energy consumption from both the residential and or commercial buildings. The photovoltaic array represents the largest array in New Mexico. Various manufacturers and types of panels are installed and used in the micro grid for the photovoltaic energy source. The arrays of panels are tested for efficiency and power output based on configuration of crystalline structure. Data is collected for each type of panel and reported to DOE. Invertors are a significant component that is tested. Various types and manufacturers are tested. Other locations assist in longevity testing of invertors