Objective

- To evaluate the effectiveness of distributed energy storage in mitigating the impacts of high photovoltaic (PV) penetration and variability on the Maui distribution system

Deliverable

- Final technical report describing analysis results and GridLAB-D modifications
  - Planned for April 2013

Overall Value of Study

- This study aims to understand how high PV penetration will impact the distribution system, and how effective distributed storage might be in mitigating those impacts
- Previous and ongoing work (such as the Hawaii Solar Integration Study) has been solely concerned with bulk power system

Project Status

- Statement of work has been developed, in consultation with HECO (Hawaiian Electric Company)
- PNNL has created GridLAB-D models for the MECO feeders of interest

Next Steps

- Team will select feeders for analysis
- SNL will specify a storage module for use in GridLAB-D
  - Will allow for generic parameterization of battery storage systems
- PNNL will implement the SNL storage models in GridLAB-D
- NREL will provide the solar resource data for integration into the GridLAB-D models
- Team will perform analyses to study the value of distributed energy storage under a scenario of high PV penetration

Study Tasks

- Task 1: Develop GridLAB-D models for selected distribution feeders
  - Perform analysis to estimate value of distributed energy storage for solar PV integration
- Task 2: Investigate benefits of advanced inverter control features to mitigate voltage and variable power output from solar PV (under high penetration scenarios)
- Task 3: Conduct preliminary electrical vehicle (EV) analysis

Overall Value of Study

We would like to thank the Energy Storage Program in the DOE Office of Electricity for its support of this work.