Trilab Distributed Storage Study for Maui

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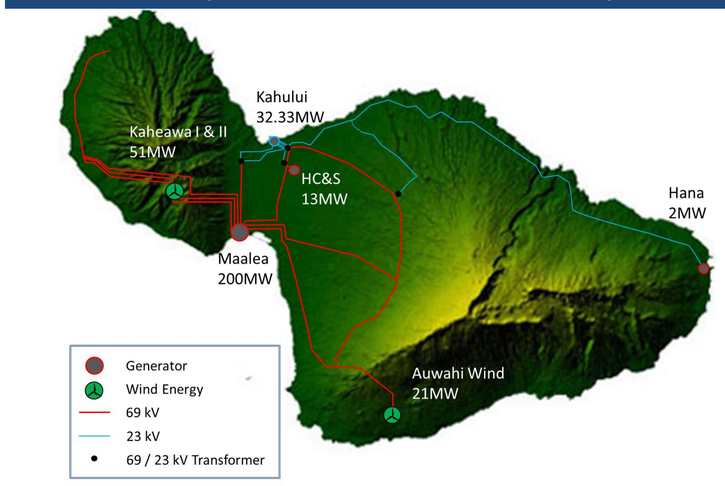
Objective

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



Study Tasks

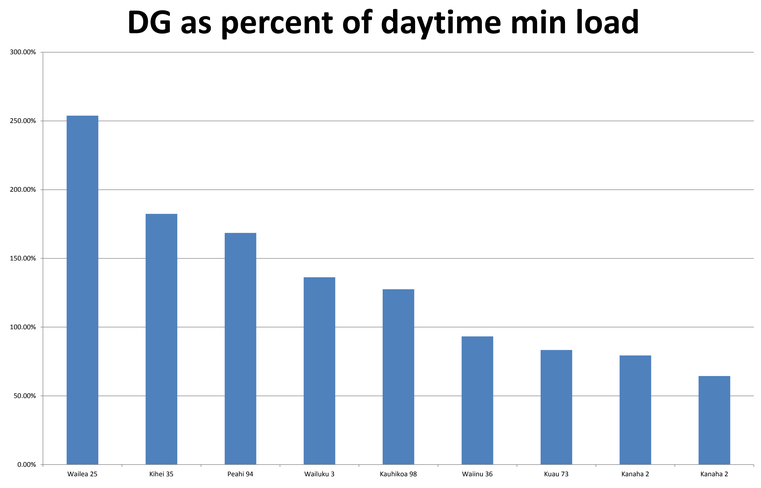
- Task 1: Develop GridLAB-D models for selected distribution feeders
  - Perform analysis to estimate value of distributed energy storage for solar PV integration
- Task 2: Investigate benefits of advanced inverter control features to mitigate voltage and variable power output from solar PV (under high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

Overall Value of Study

- 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

Deliverable

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



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

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