



# Hawaii Natural Energy Institute Projects

*Grid Integration & Renewable Power Generation*

*Oahu Distributed PV Grid Stability Study*

## **PROJECT SUMMARY**

Evaluation of the Oahu electric grid's stability and dynamic performance during contingency events with increasing levels of distributed photovoltaic solar resources. Analyses include the effects of generator trip and load rejection contingency events, transmission faults, and grid strength on system stability, including the identification and impacts of potential mitigations.

In collaboration with GE, this study also creates a composite frequency stability metric that can quantify the level of risk to major system disturbances over all hours of the year from production cost simulations, in contrast to traditional methods that typically evaluate only a few hours based on potentially challenging system conditions. This approach also better informs long-term planning analyses.

## **PROJECT RELATED LINKS**

### **TECHNICAL REPORTS:**

1. [Part 1: System Frequency Response to Generator Contingency Events](#), March 2016
2. [Part 2: System Frequency Response to Load Rejection Events](#), May 2016
3. [Part 3: Grid Strength](#), July 2016
4. [Phase 4: Battery Energy Storage Analysis](#), December 2017

### **PRESENTATIONS:**

1. [Grid Stability Modeling in Hawaii](#), presented by HNEI and GE, April 2016