

Hawai‘i Sandia Efforts in RE

Daniel Laird

Energy and Infrastructure Future
Sandia National Laboratories

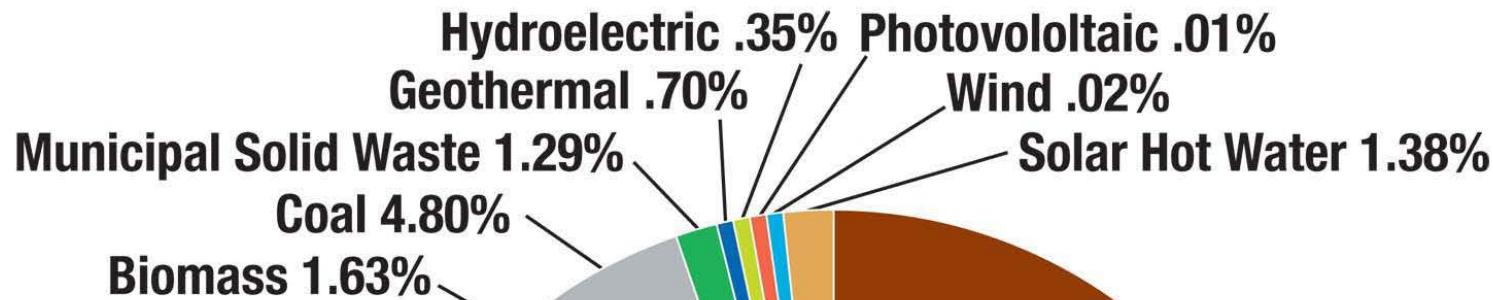


Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.



Primary Energy

HI - 2005

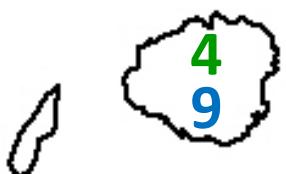


Petroleum 89.81%

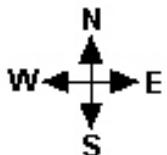
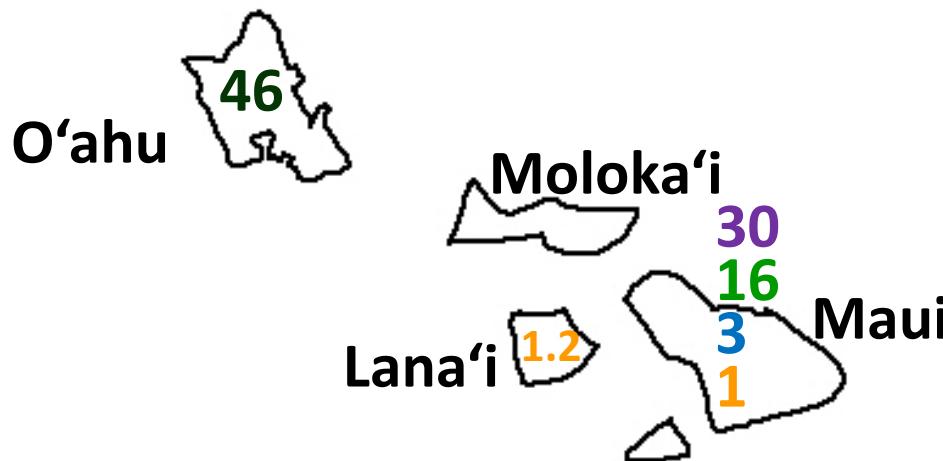
source: State of Hawai'i Strategic Industries Division

Current RE installations

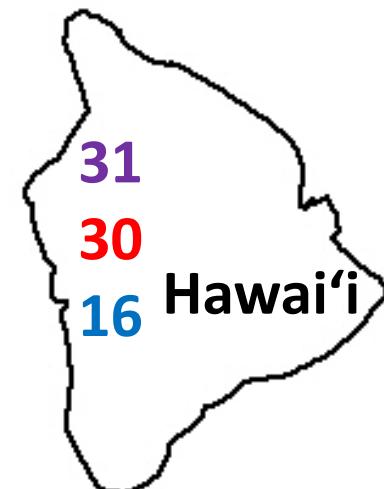
MW - 2010



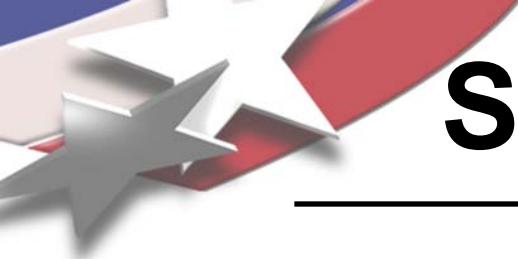
Kaua'i



Wind (61)
Solid Waste (46)
Geothermal (30)
Hydroelectric (28)
Biomass (20)
Solar PV (2.2)

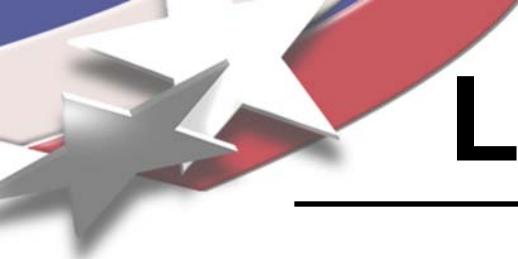


source: Hawai'i Clean Energy Initiative



Sandia Projects in Hawai‘i

- Kaua‘i Solar Integration Study
- *Lana‘i La Ola PV Project*
- PV for State Airports
 - 15 sites
- Solar Fields
 - Collaboration with Forest Cities
 - Maui and O‘ahu
 - PV and CSP
 - 2200 homes / 2 schools
- Storage for RE

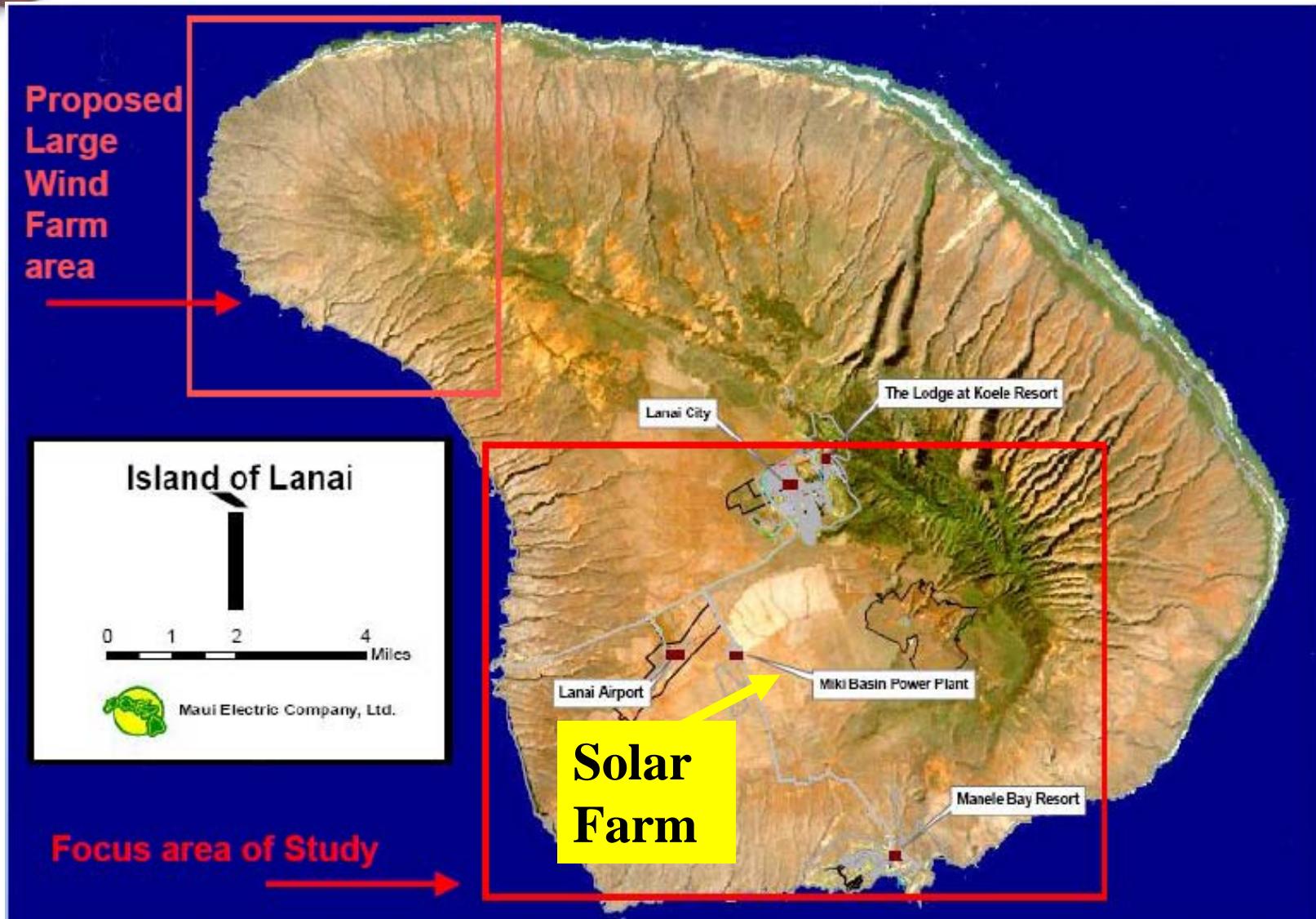


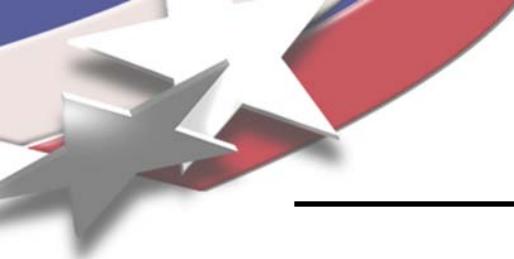
Lana'i La Ola PV Project

- **Hawai'i Clean Energy Initiative Goal:**
70% penetration of renewable energy for all energy use by 2030
- **Lana'i Island Goal:**
100% renewable electricity generation and transportation services by 2012
- **Lana'i La Ola PV Goal:**
Fully utilize La Ola 1.2MW PV Plant

Sandia Lead: Jennifer Stinebaugh

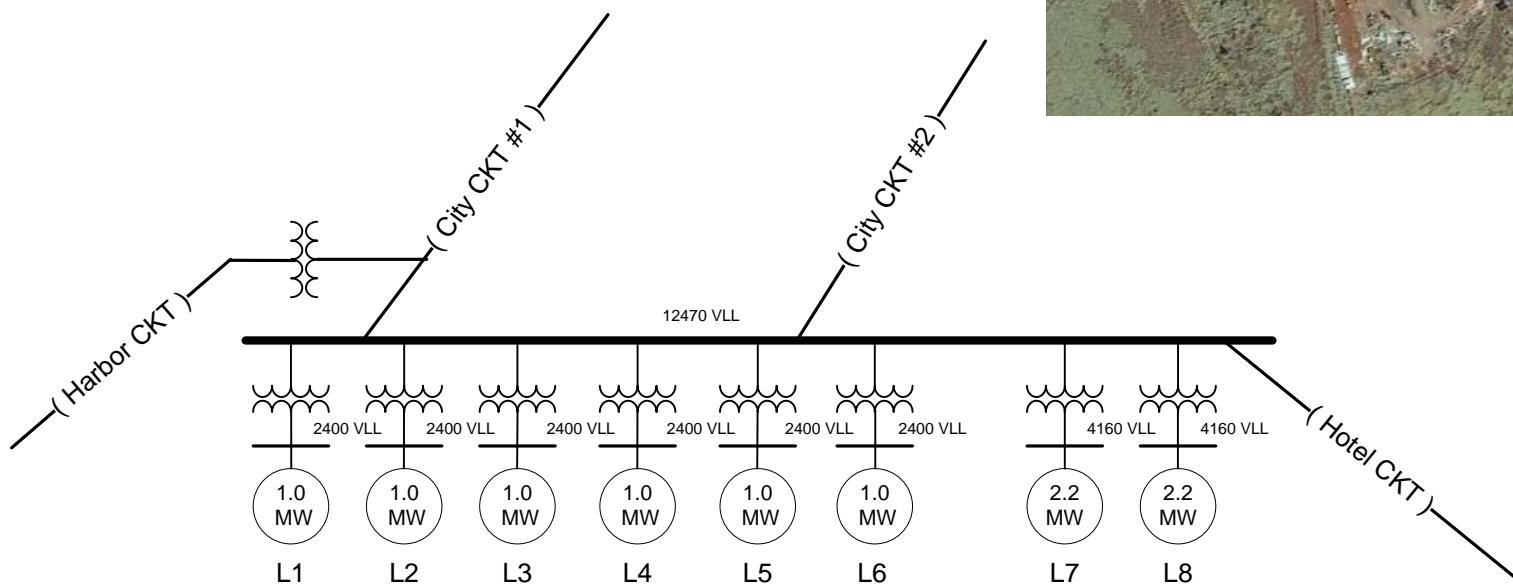
Project Site





Miki Basin Power Station

Six 1.0 MW EMD Diesel Generators
Two 2.2 MW Caterpillar Diesel Generators





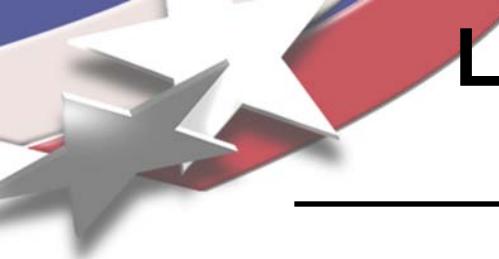
1.2MW Hawaii's largest Solar Farm in service December 2008

10 acres, 12 separate arrays, 7,000+ panels, tracker system

3,000MWhour production = 30% of Lanai's daytime peak demand, 10% of Lanai's annual demand

2,300 tons of carbon dioxide emissions eliminated annually = 5,000 barrels of oil or 237,000 gallons of gasoline

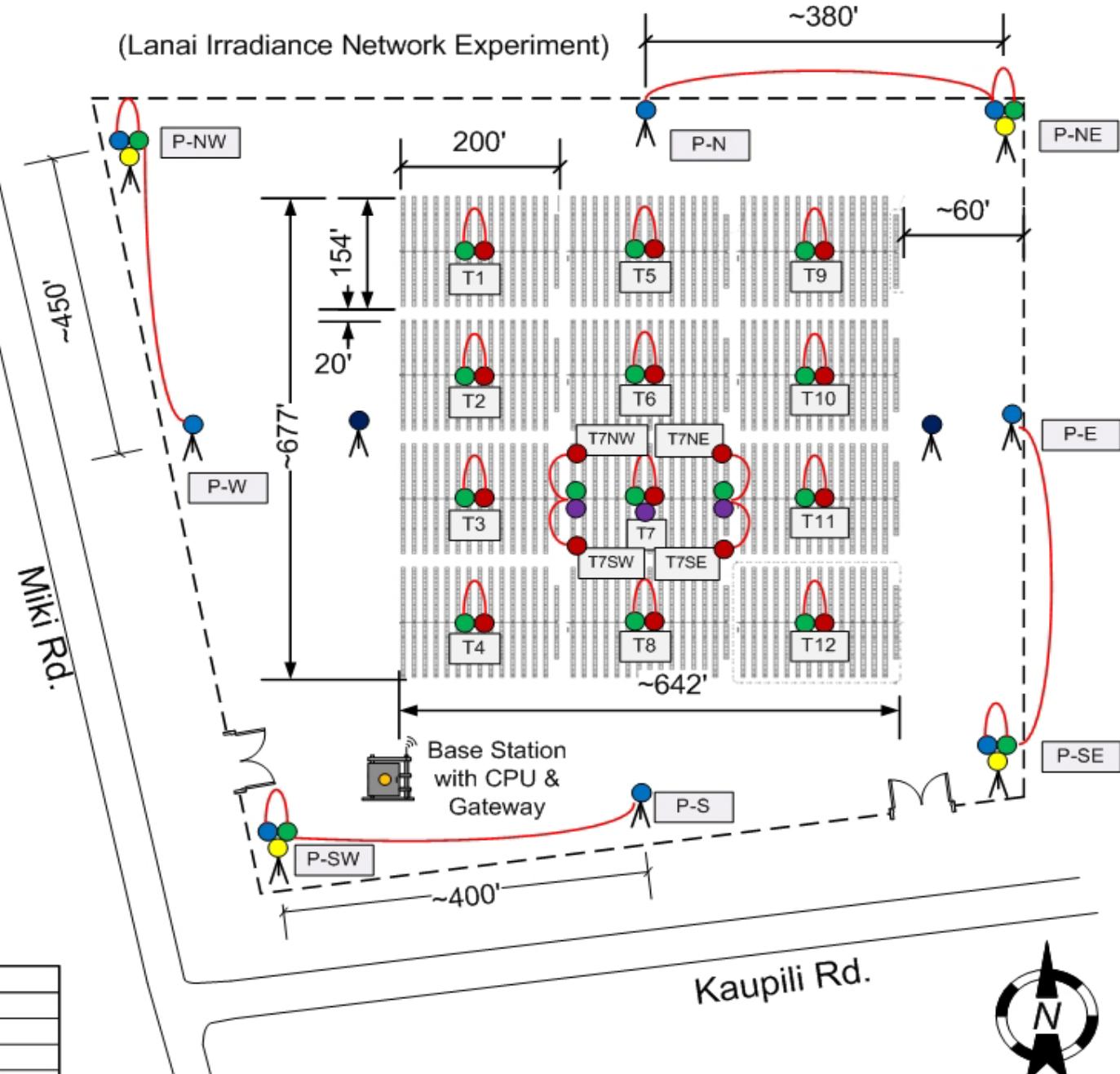
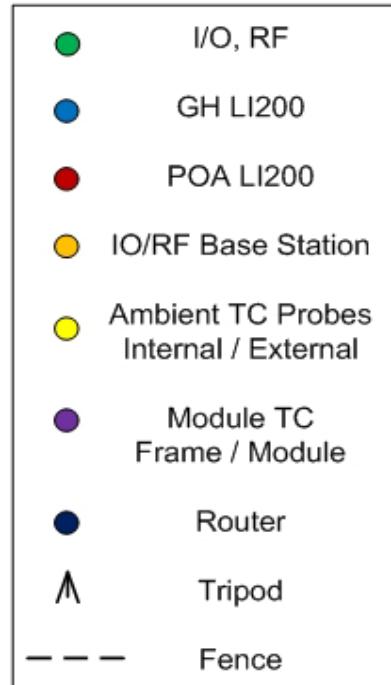




Lana'i Irradiance Network Experiment (LINE)

- First-of-its-kind experiment to investigate effect of cloud patterns over large PV array
- Correlate cloud movement over array to instantaneous PV power output
- Derive predictive system operation strategy to mitigate effect of cloud cover

L.I.N.E Site Plan



Lanai Site Plan.vsd
 U:\Users\Adam\Lanai
 Prepared By: Adam Moya
 Date: 08/17/2009 Ver: 1.0
 Distributed Energy Technology Laboratory

