



January 21, 2011

Energy Briefing

Can an Island Go Green: The Lānaʻi Experience

**Castle & Cooke
Renewable Energy**





Identify the Problem

Create the Solution

Execute

Lānaʻi –Prototype for the World

- Lanai's peak demand = ~4.5 MW (megawatts)
 - Q: Why not just do 4.5MW of solar panels or a couple of wind turbines and be done?
 - A: As a larger percentage of an electric grid comes from “as available” resources like solar & wind, exponential amounts of **energy storage** becomes necessary. Currently, Energy Storage (batteries, pumped hydro, etc) is expensive.

Possible Path to 100% Renewable Electric Grid - Lānaʻi

2008	2009	201X	20XX	20XX
Existing Diesel Generators	Existing Diesel Generators	Existing Diesel Generators	Existing Diesel Generators	Existing Gens To Bio-diesel (18%)
				CHP (Bio-Diesel) (22%)
	CHP (Diesel)	CHP (Diesel)	CHP (Bio-Diesel)	Large Wind Farm Interconnect or Small wind (40%)
		1.0MW solar	1.0MW solar	1.0MW solar
1.2MW PV	1.2MW PV	1.2MW PV	1.2MW PV	1.2MW PV

%RE → 10%

10%

20%

50%

100%





1.2MW AC Hawaii's largest Solar Farm in service 12/19/2008

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

\$1M+ in payroll to Lanai Residents: ~22 of 25 construction jobs were filled by Lanai Residents

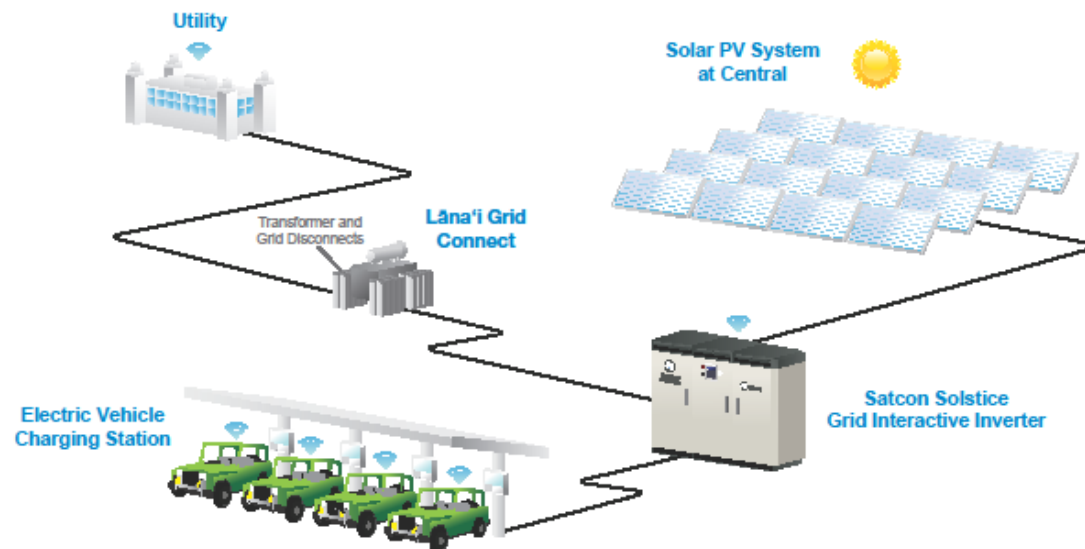


Lānaʻi Solar Farm – Battery Pad



Lānaʻi Grid Tied Electric Vehicle PV Charging Station

Grid Interactive Solar-Powered Electric Vehicle Charging Station



Satcom Technology Corporation, Castle & Cooke Renewable Energy, and Colorado University – Boulder are demonstrating Satcom's **Grid-Interactive Solar-Powered Electric Vehicle Charging Station** technology. While plugged into Satcom's Charging Station, the Electric Vehicle's batteries will:

- Rapidly charge with 100% renewable power
- Improve power quality from a roof-mounted solar photovoltaic power generation system

This one-of-a-kind demonstration project will help reduce Greenhouse Gas emissions and Hawaii's dependence on petroleum in both the Transportation and Electric Power markets, while improving power quality on Lana'i's Electric Grid. Funding for this project was competitively awarded by Hawaii Renewable Energy Development Venture, a program funded by the U.S. Department of Energy.

Lānaʻi Additional Actions

- Voltage Regulation
- Biofuel in selected Fleet vehicles
- Solar Hot Water Heater pilot program
- VFDs & Lighting efficiency at Hotels
- Expanded photovoltaic access on the Manele circuit



**“The opportunity to reduce
Hawaii’s dependence on
foreign oil is now;
we just need the courage
to move forward.”**

Harry Saunders, President Castle & Cooke Hawai‘i

Mahalo

Identify the Problem

Create the Solution

Execute Now

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