Hawai‘i’s Utility of the Future

Clean Energy Day
Hawai‘i Energy Policy Forum
July 2014
Transitioning to a very different future

- Fossil Fuel
- Centralized Generation
- Less flexible big generators
- One-way grid

Customer Choice

- Clean Energy
- Distributed Generation
- More flexible small generators
- Multi-directional grid

Hawaiian Electric
Maui Electric
Hawaiʻi Electric Light
Transitioning to a very different future

Past
Vertically-Integrated Utility

Future
Integrated Grid

System Ops
Our future must be driven by customers
What do customers want?
Building a new relationship is key

- A partner in helping manage the grid
  - Distributed Generation
  - Demand Response programs: rewarding customers for helping when the grid needs it
  - Time-of-Use rates

- Differentiated Pricing
  - Reflects value provided or received
Customer Partners
EV charging can be used to shift load

- Dynamic and Time-of-Use pricing, along with smart grid, can smooth demand profile
  - Shift charging to high solar and low load times to allow more renewable energy on the grid
  - Requires customer behavior change; transition may not be easy
A diverse clean energy portfolio

Renewable Energy Projects as of December 2013

18% Renewable

- H-POWER (municipal solid waste) 73MW
- Kahuku 30MW
- Kawaiola 69 MW
- Makila Hydro 0.5MW
- HC&S (bagasse, coal, hydro) 16MW
- Auwahi with battery 21MW
- Hawi Renewable Development 10.5MW
- Wailuku River Hydro 11MW
- Puueo & Waiau Hydro 3MW
- Puna Geothermal 38MW
- Tawhiri 20MW

- Kapolei Sustainable Energy Park 1MW
- Kalaehoa Renewable Energy Park 5MW
- Kalaehoa Solar Two 5MW
- Lana'i Solar with battery 1.2MW
- Kaheawa I 30 MW
- Kaheawa II with battery 21MW

All Islands Customer PV 301MW
National PV leader

PERCENTAGE OF CUSTOMERS IN HAWAI‘I WITH SOLAR

Hawaiian Electric
Maui Electric
Hawai‘i Electric Light
Kaua‘i Island Utility Cooperative

0.5%**
11.0%*
9.0%*
8.0%*
6.1%**

*As of 3/31/14, **As of 12/31/13.
Continued high growth of PV in Hawaiʻi

25% of circuits are already over 100% of their Daytime Minimum Load (DML)

Aggregate peak load of all islands combined is about 1,550 MW
Many small generating units need to act like one large one.
Industry Partners

- Solar industry
- Inverter manufacturers
- Industry research
  - EPRI
  - NREL
  - Others
Energy storage can help

- Today, with est. 330 MW of PV and wind, O‘ahu grid stability has eroded. Energy storage can help.

- Energy Storage to be installed on the O‘ahu grid to preserve system stability and enable more variable renewable resources
  - RFP for energy storage capability issued in April 2014
  - 60 to 200 MW
  - est. to require 2-3 years to fully implement
To sum up….

◆ Our role is to ensure our customers evolving needs are met
  o With cleaner energy sources
  o Safely
  o Reliably
  o Affordably

◆ Customers are increasingly our partners

◆ Reinventing the grid is key

◆ Rapidly evolving technology will help us get there