



**Hawaiian Electric
Maui Electric
Hawai'i Electric Light**

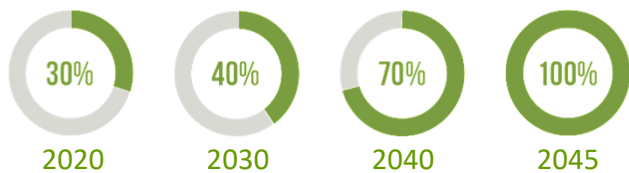
Hawaii's DR Portfolio in Action



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Introduction to the Hawaiian Electric Companies



Hawai'i Clean Energy Initiative RPS Goals

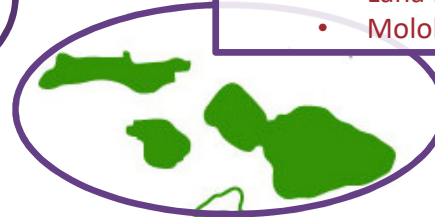


Hawaiian Electric
Customers: 302,000
Firm Capacity: 1,727 MW
Appx. Non-firm Capacity: 603 MW (411 MW DG) 19.4% RE
Approximate System Peak: 1,246 MW

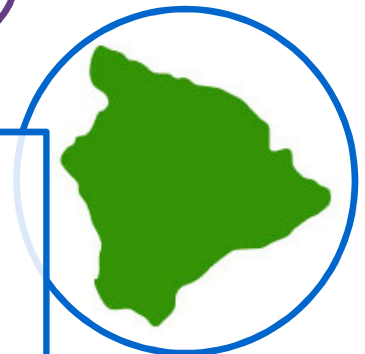


Maui Electric
Customers: 70,000
Firm Capacity: 274 MW
Appx. Non-firm Capacity: 167 MW (94 MW DG) 36.9% RE
Appx. System Peak:

- Maui 207 MW
- Lana'i 5 MW
- Moloka'i 5.5 MW



Hawaii Electric Light
Customers: 83,000
Firm Capacity: 284 MW
Appx. Non-firm Capacity: 129 MW (81.5 MW DG) 54.2% RE
Approximate System Peak: 185 MW



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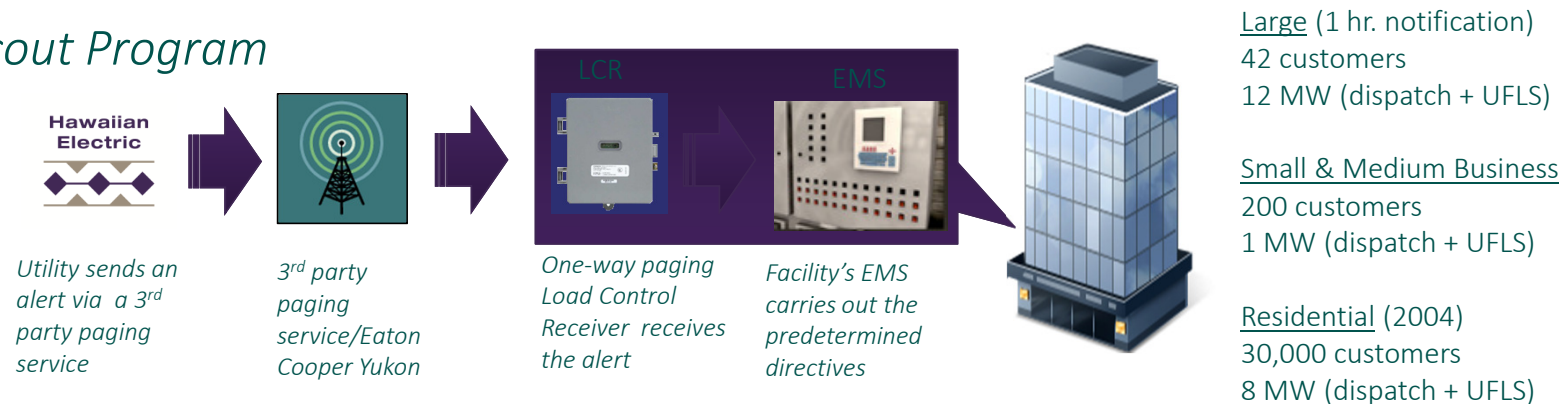
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DER Interconnection Programs

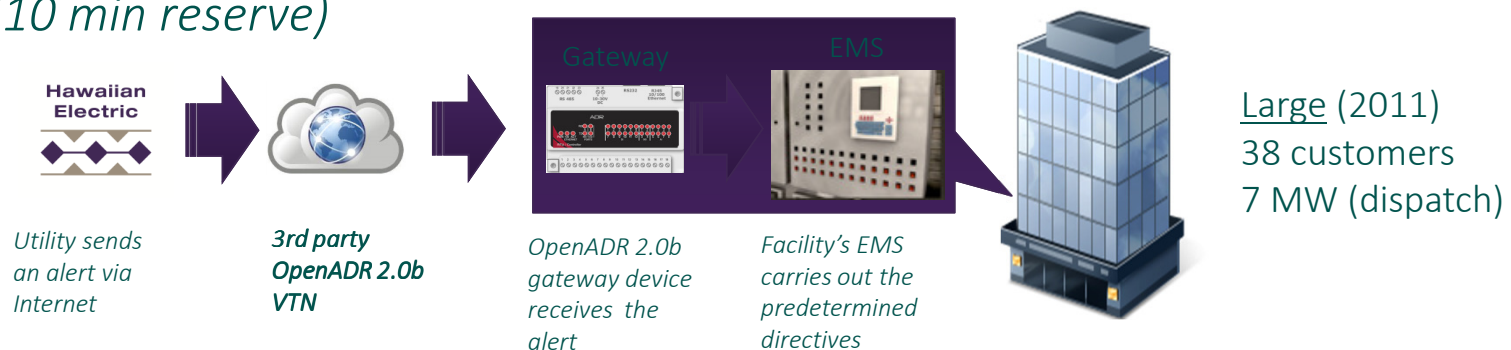
- 1) Legacy Program: net energy metering (NEM)
 - Full retail rate
 - closed, 400 MW installed
- 2) Replacement programs
 - CGS (customer grid supply), reduced incentive, closing soon, 25 MW cap
 - CSS (customer self supply) no export allowed
- 3) 2018 DER Phase II (req. advanced inverters)
 - Smart export (constrained export hours, non-solar hours) 25 MW cap, PV+ES
 - CGS+, PV only, 35 MW, reduced incentive for export, utility curtailment control

Legacy Demand Response on the Hawaiian Islands

EnergyScout Program



Fast DR (10 min reserve)



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Integrated Demand Response Program Portfolio

PUC established objectives to expand the Companies DR programs (2014):

- Integrated portfolio of programs
 - Deals with variable generation variability
 - Provides system reliability
 - Delivers ancillary services
 - Ensures customer benefits
- Comprehensive evaluation
 - Evaluation of DR potential
 - Valuation of services
- Third-party participation, e.g. aggregators

January 2018: PUC approves Companies' portfolio – Customer recruitment for deployment of DR resources for Oahu (and to a smaller extent, Maui and Hawai'i) to start by third-quarter 2018

November 2018: PUC approves DRMS Project

Grid Services and Grid Service Tariffs

Capacity

- Load shift program (shift load to the mid-day from evening peak)
- Time of use rates
- Peak reduction program

Fast Frequency Response (FFR)

- Autonomously triggered (load reduction or generation increase) for 30 min or until frequency stabilizes, due to an under frequency excursion: 59.7MHz, 12 cycle response

Regulating Reserve (secondary frequency regulation)

- Response to a frequency regulation signal (AGC: automatic generation control)

Replacement Reserve

- 10-30 minute response after notification, 1-2 hour duration



Questions to Answer

1. What is your utility's policy towards using standard communications protocols? Why is it that way? Is it evolving and how?
2. Do you mandate the use of OpenADR? If yes, for what applications and why? If not, why not?
3. If you require the use of OpenADR, do you require certified products? Why or why not?
4. What would be most valuable to your utility from the OpenADR Alliance over the next 2-3 years? Value can be technical, policy, education or?



Thank you



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