Hawaiian Electric Demand Response Programs

OpenADR Alliance

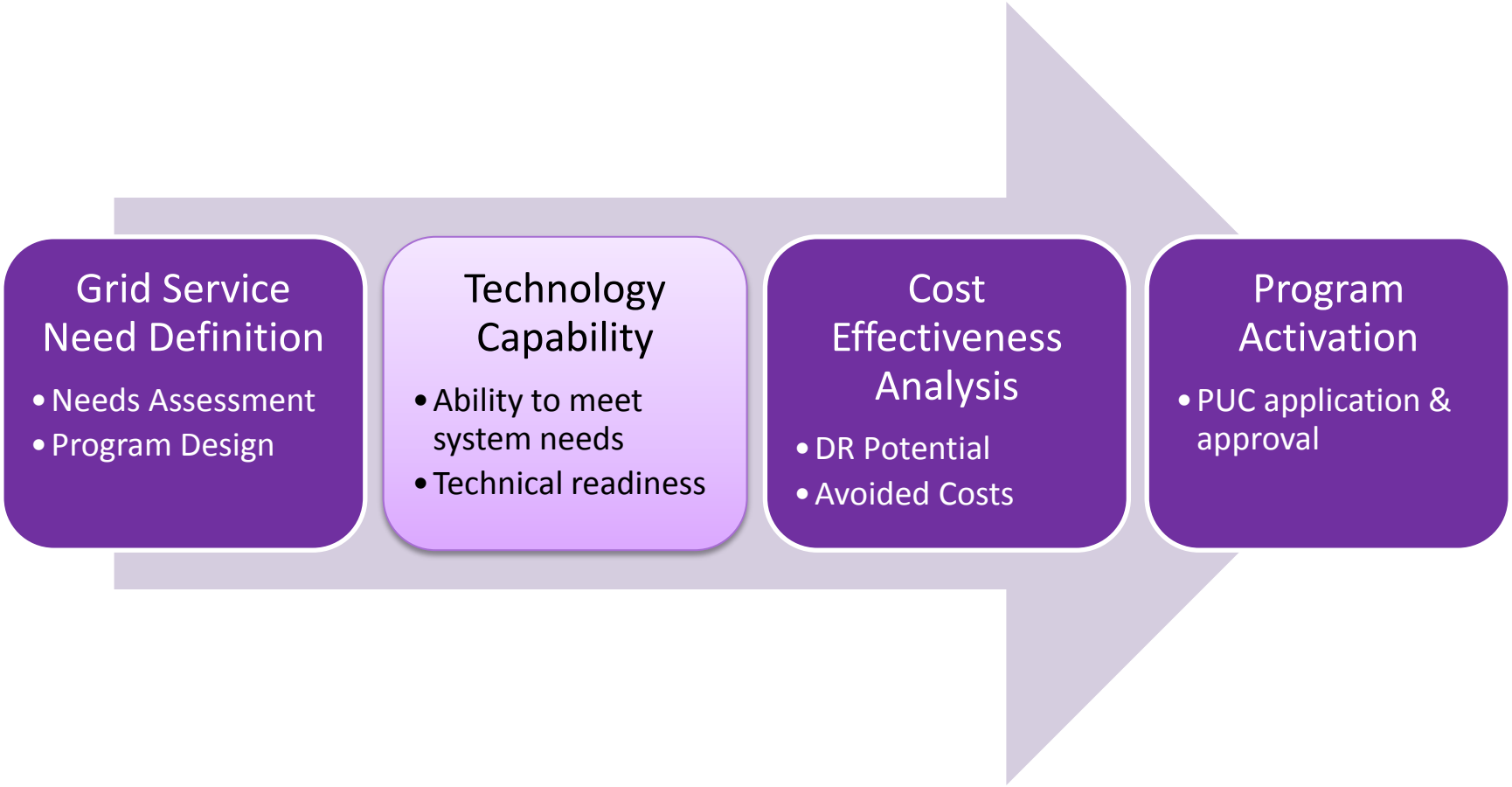
May 13, 2015

Hawaiian Electric
Maui Electric
Hawai‘i Electric Light

Background

- One utility grid per island; no interconnections
- 400,000+ customers (Oahu, Maui County, Hawaii)
- Hawaii's State goal - 100% renewables by 2045 awaiting governors approval
- FastDR Pilot started using OpenADR in 2012
  - 0 min notification and 10 min response
  - Currently transitioning all customers (40) to OpenADR 2.0b

Program Design



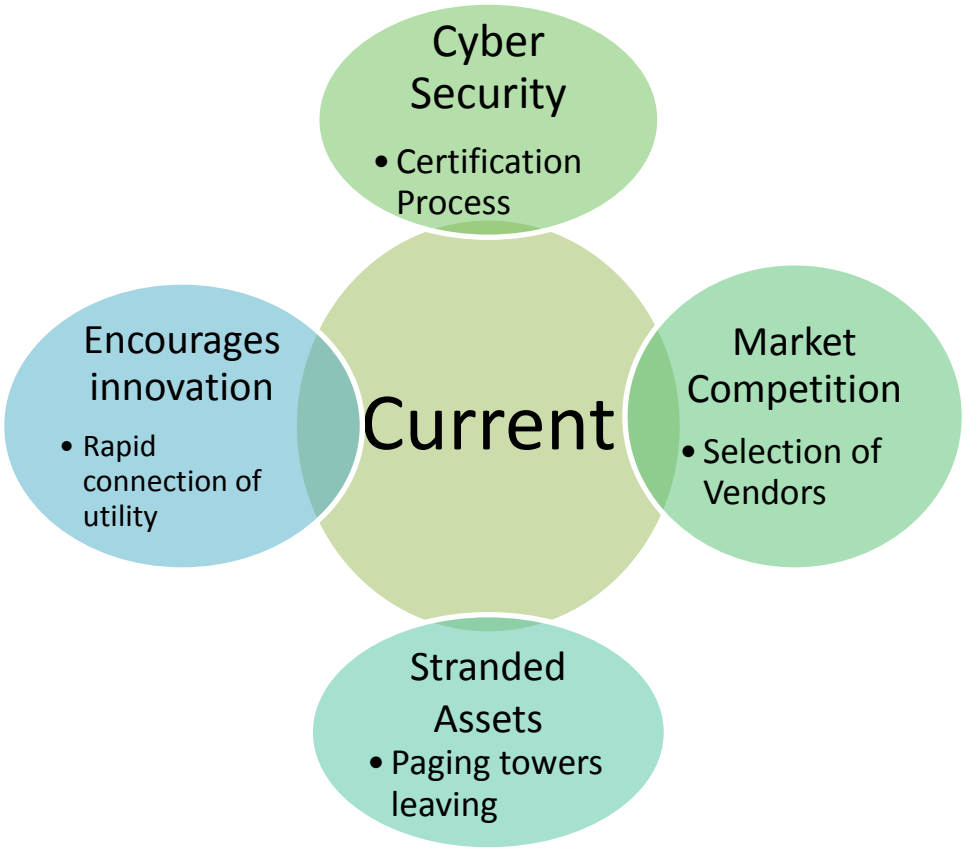
Grid Service Products

	Description	Response Speed	Response Duration	AGC/ Freq Required	Accuracy
Capacity	Used to meet demand plus reserve margin; supplied by on-line and off-line resources, including interruptible load. Test Requirements: HI-Mod-0025 and HI-Mod-0010	1-3hrs	0-4 hrs	No	must be predictable
Regulating Reserves	Used to provide normal frequency regulation	2 sec	30 min	AGC	0.1MW
Contingency Reserve	Reserves deployed in response to loss of the largest singe resource on each island.	7cycles =11.7ms	na	Freq	± 0.02 Hz and ± 0.0167 cycles
Time Delay	Slower contingency reserves. Test Requirements: HI-Mod-012, HI-Mod-010, and HI-Mod-025,26,27	0.5-30 sec	na	Freq	± 0.02 Hz and ± 0.02 seconds
10- Minute Reserve	Offline resource used to restore regulating and contingency reserves	10min	2 hrs	AGC	must be predictable
30- Minute Reserve	Offline resource used to restore regulating and contingency reserves	30min	3 hrs	AGC	must be predictable
Long Lead-Time (Non-AGC) Reserve	Resources that can be available for quick start and can add to system ramping capability	30 min (<2 min Angie)	2-3 hrs	Yes/No	must be predictable
Inertial or Fast Frequency Response	If the inertia are supplied from a resource that cannot sustain the load, primary or secondary resources must be available to take over without a drop in system frequency.	11.7ms	2-3 sec	Freq	must be predictable
Secondary Frequency Control	Same req as Reg Res	2 sec	30 min	AGC	0.1MW
Accelerated Energy Delivery	Shifting the demand for energy from high demand periods to lower demand periods	na	na	No	must be predictable

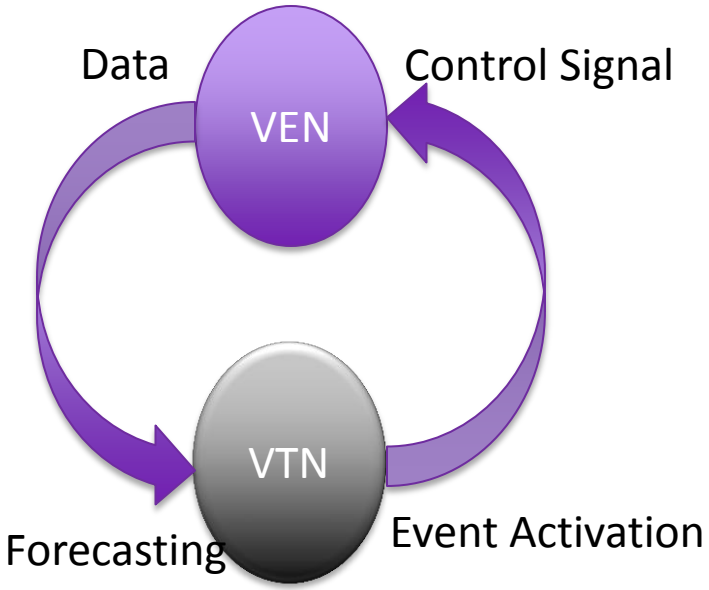
Status as of today

FastDR Current Requirements

- OpenADR 2.0b certified
- VEN's Approved by Hawaiian Electric's Information Assurance
- Meter telemetry reported to VTN every 5 minutes using EiReport
- Event Dispatch



Desired Technology Capabilities



- Event Activation
  - EMS/AGC to DRMS
    - DNP3 and RTU for integration
  - Multiple communication options
    - AMI, Wi-Fi, Broadband
  - 3rd party integration
  - Frequency/Voltage trip at VEN
  - Locational dispatch
- Forecasting
  - Real Time equipment status
  - Real Time meter data
  - Hourly forecasting
  - Day-ahead forecasting