



# Demonstrating “FastDR” & Integrating Intermittent Renewable Energy

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**Honeywell**

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Hawaiian Electric Company  
Maui Electric Company  
Hawaii Electric Light Company

# Hawaii Faces Unique Challenges



- Most remote island chain on earth
- One grid per island w/ large dependence on imported fossil fuels
- Highest electricity prices in nation

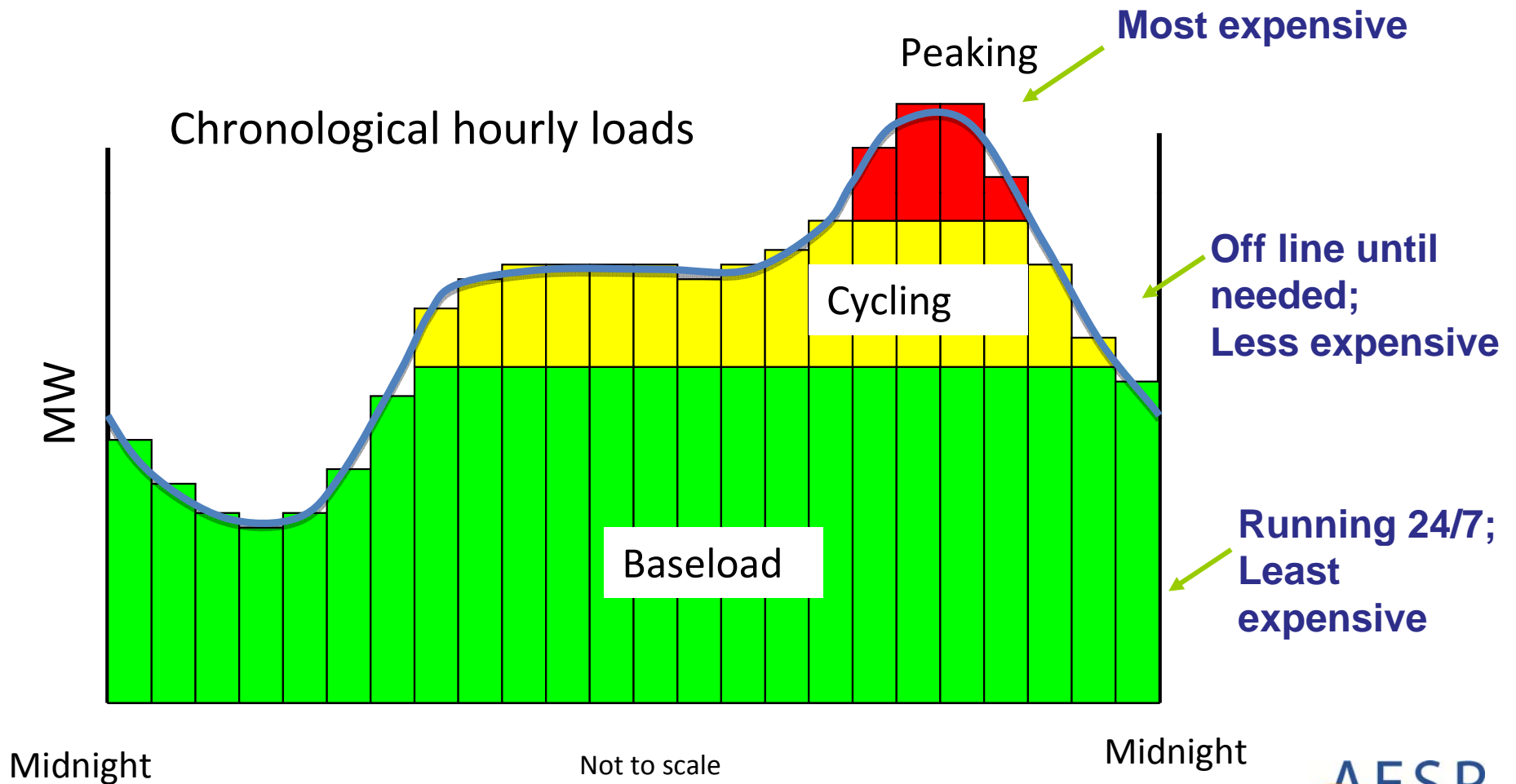
# Hawaii's Clean Energy Policies

- By 2030, 70% of electricity and transportation fuels to come from energy efficiency and renewable energy
- Renewable sources include biofuel, biomass, geothermal, waste, wind, solar, hydro

***Renewable energy creates intermittency challenges on the grid***



# Need to Address Peaking Demand

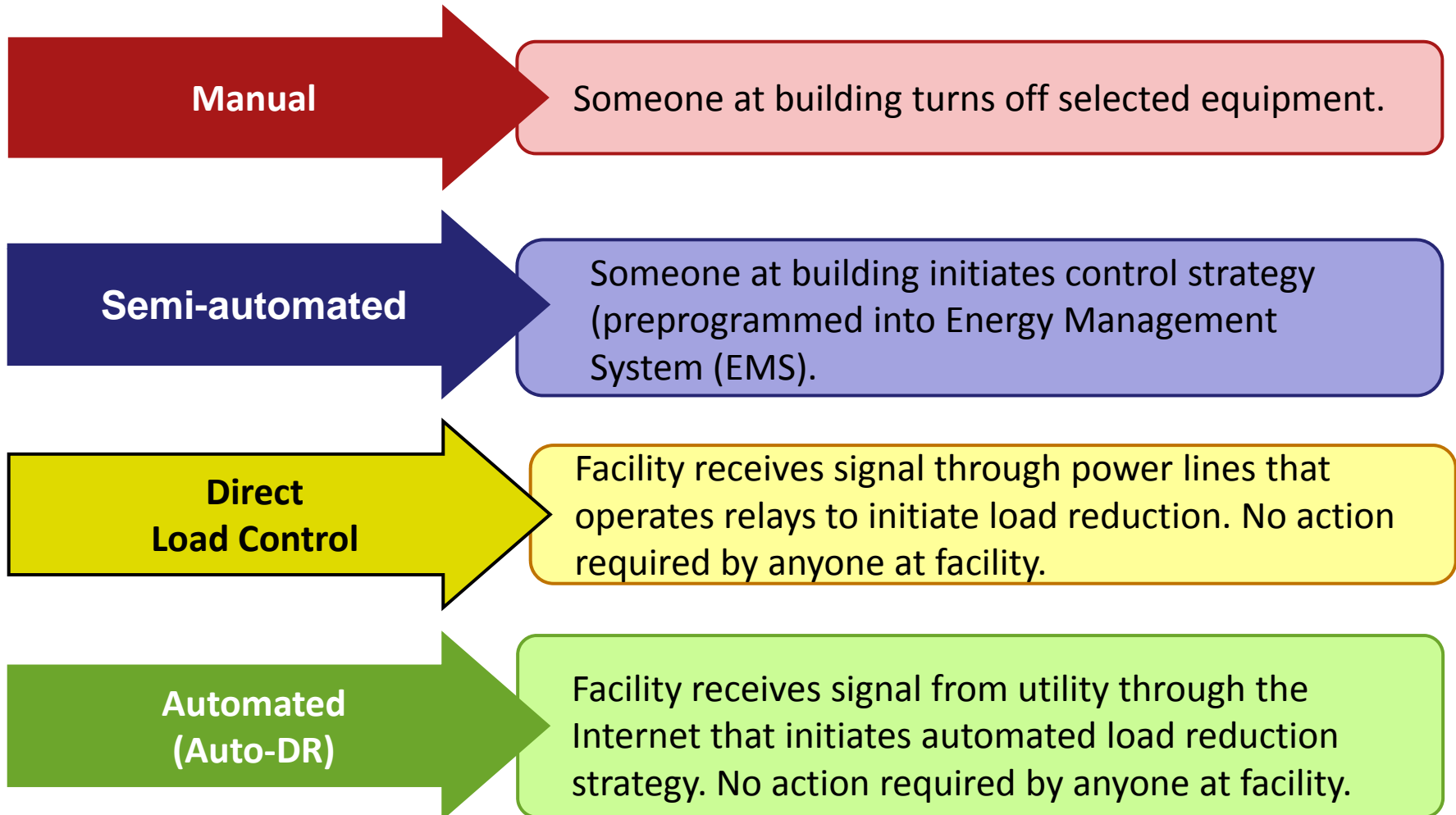


# Balancing the Grid with Demand Response



- Intermittency of wind and solar generation poses challenges on the grid
- Demand Response can be a bridge to delay or avoid using fossil-fuel generation

# Various DR Strategies



# What Is Auto Demand Response?

- **Demand Response** is a voluntary reaction to an event called by a utility requesting energy curtailment during an anticipated peak period
- An **event** is often called by the utility to balance the grid for price or reliability reasons
- **Auto DR** uses the OpenADR 2.0 signal to communicate in a secure and automated way to achieve this demand reduction
  - Utility receives near real-time data for maximum load shed
  - Customer pre-determines automated shed strategy to minimize impact



# Open Standards in the Smart Grid

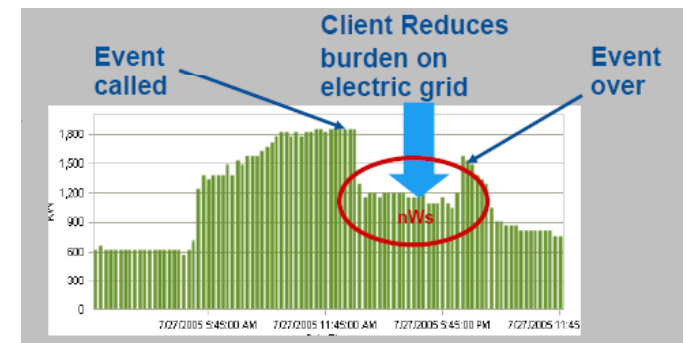


- **OpenADR Alliance** founded in Oct 2010 to foster industry collaboration
- **75+ members** including utilities, equipment/software vendors and research institutions
- **Identified as key standard** in National Smart Grid Initiatives
- **OpenADR 1.0 specification** released in 2010 and **OpenADR 2.0a certification** of products began in 2012

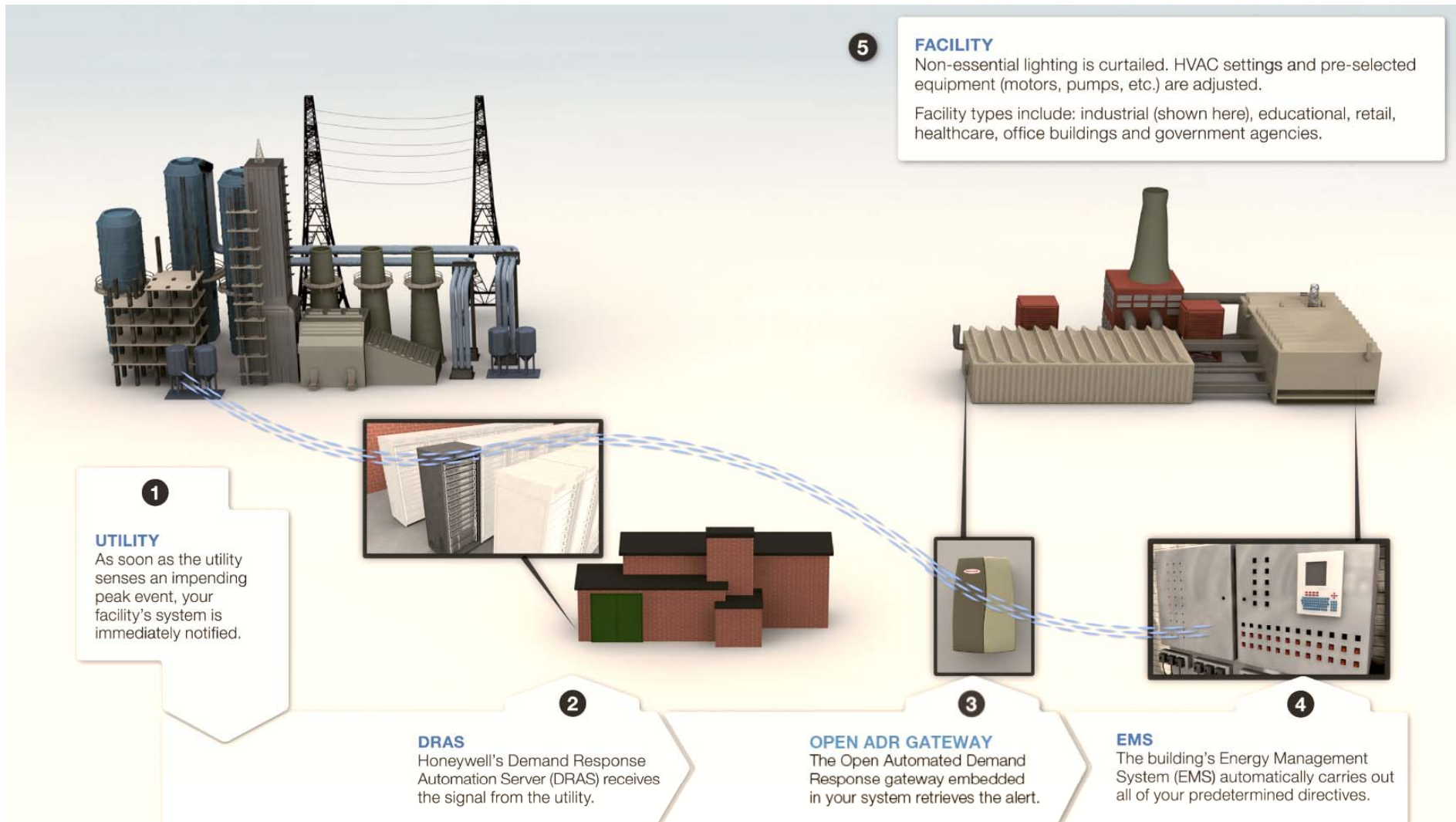


# Typical Auto DR Event

- **Grid stress** is created when peak demand is greater than the amount of energy that is readily available
- Notification of the impending event is given to customers via **OpenADR signal**
- Customers with an **Energy Management System (EMS)** can opt in to shed load via automated settings such as:
  - Turning off or adjusting specific equipment
  - Pre-cooling buildings in early morning hours
  - Turning on emergency generators
  - Shutting off non-essential lighting
- When an Auto DR Event is over, normal settings are restored



# How Honeywell Auto DR Works



# HECO “Fast DR” pilot

- Objective to enroll customers (min 50 kW) by manual, semi-automatic, or automatic load shedding
- Action taken only when requested by utility
- Response in 10 minutes or less; energy reduction two hours or less



- Voluntary, with opt out allowance
- Annual credits \$3,000 or more, depending on designated load shed, whether activated or not
- Added payments if Fast DR is triggered

# Roles & Responsibilities



- Overall program design & management
  - Event management (demand response automation server – DRAS)
  - Metering protocols
  - Settlement & incentive payments
  - Funding
  - Evaluation

- Implementation
  - Sales & Enrollment
  - Technical Audits
  - Shed Schema Engineering
  - Equipment & Communications Installation
  - Commissioning
  - Post installation service



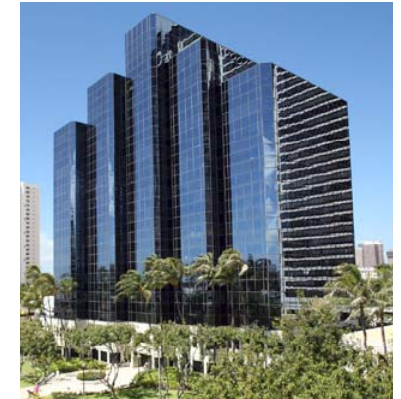
# Current Enrollments



Admiral Thomas



Shriner's Hospital  
for Children



Pacific Park Plaza

Sheraton Waikiki Hotel



Allure  
Waikiki

# Findings By Sector

<u>Sector</u>	<u>Observations</u>
Office Buildings	Good candidate, primarily HVAC strategies
Retail	Total demand small, difficult to control rooftop units
Health Care	Good candidate, primarily HVAC strategies
Hospitality	Receptive, focused on customer comfort with HVAC potential
Large Condos	Receptive but need additional funding for controls

# Lessons From the Pilot

- Need to reduce event duration
- Provide additional incentives
  - For more events
  - For enabling automation technologies
  - Based on \$/kW
- Enhance marketing message
  - Benefits to customer
  - Increase renewables on grid



## Save the Dates

Apr. 29-May 1, 2013

AESP's Spring Conference  
Dallas, TX

Sept. 30-Oct. 2, 2013

AESP's Fall Conference  
Seattle, WA

Jan. 27-30, 2014

AESP's National Conference  
San Diego, CA

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