

ENERGY INNOVATION, EFFICIENCY AND CLIMATE CHANGE:

INNOVATIVE ENERGY POLICIES AND INITIATIVES IN MAUI COUNTY

RECEIVED AT EACF MEETING ON 12/3/19
from Alex de Rooke

Progress Towards 100% Clean Energy Goal

STATE OF HAWAI'I CLEAN ENERGY GOALS:

- 30% renewable portfolio standard (RPS) by 2020
- 40% RPS by 2030
- 70% RPS by 2040
- 100% RPS by 2045

•**4TH QUARTER 2018: MECO RPS 34%**

•**1ST QUARTER 2019: MECO RPS 38.9%**

JUNE
2017

Maui Electric reached a peak of 77% of its power coming from renewable energy resources

APRIL
2018

Maui Electric reached a peak of ***80% of its power coming from renewable energy resources***

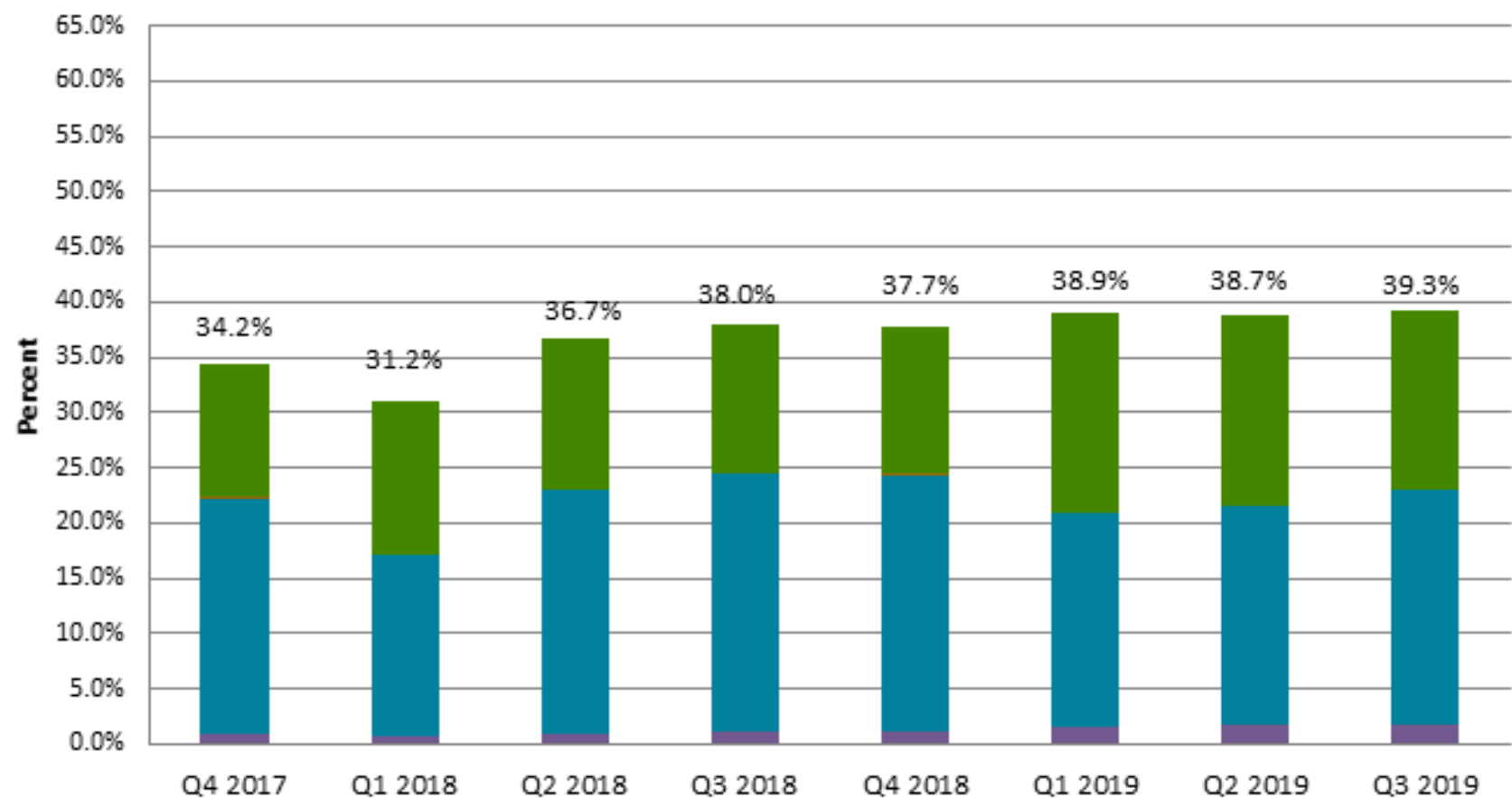
- Number of rooftop solar installations across Maui County: approximately 12,000
- Number of MECO customers in Maui County: nearly 70,000



Clean Energy Transformation



Renewable Portfolio Standard Compliance (Year-to-Date)
Maui Electric
Quarterly (8 Rolling Quarters)



■ Biomass (including municipal solid waste)

■ Hydro

■ Biofuels

■ Utility-scale Photovoltaic and Solar Thermal

■ Wind

■ Customer-sited, Grid-connected renewables

MAUI COUNTY

38%

RENEWABLE
ENERGY

RENEWABLE MIX

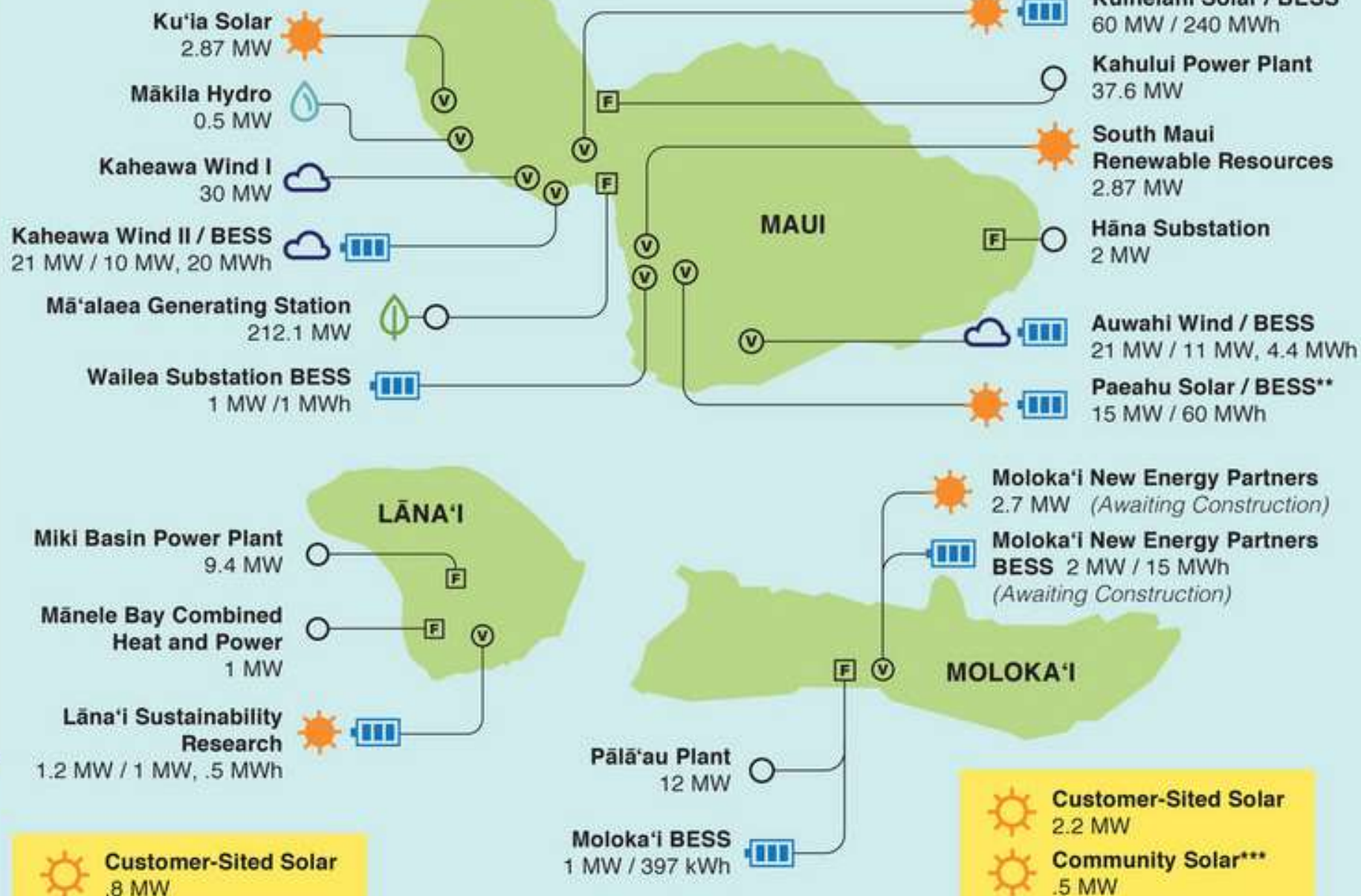
23.2% Wind

13.4% Customer-Sited Solar

1.2% Grid-Scale Solar

.1% Biofuels

80% RENEWABLE
PEAK
(April 14, 2018)



South Maui Renewable Resources Project

Location: South Maui

Owner/Operator: Kenyon Energy

Date Project Online: May 4, 2018

Landowner: Haleakalā Ranch

Land Acreage: 11.3 acres

Generating Capacity: 2.87 megawatts (MW)

Cost Per kWh: 11.06 cents per kilowatt-hour
(\$0.1106/kWh)

Financing: Key Equipment Finance

Operations & Asset Management: Bay4 Energy



Kuia Solar Project

Location: West Maui

Owner/Operator: Kenyon Energy

Date Project Online: October 4, 2018

Landowner: Kamehameha Schools

Land Acreage: 10.85 acres

Generating Capacity: 2.87 megawatts (MW)

Cost Per kWh: 11.06 cents per kilowatt-hour
(\$0.1106/kWh)

Financing: Key Equipment Finance

Operations & Asset Management: Bay4 Energy
Engineer, Procure, Construct (EPC) Contractor:
M+W Energy, Inc.



Moloka'i New Energy Partners Project

Moloka'i's First Large-Scale, Solar-Plus-Storage Renewable Energy Project

Owner/Operator: Moloka'i New Energy Partners
(Half Moon Ventures)

Date Project Approved: July 2018
(Projected online by end of 2019)

Landowner: Moloka'i Ranch

Sized to Serve: 41% of annual electricity use on Moloka'i

Land Acreage: 37 acres

Generating Capacity: 2.64 megawatts (MW)

Battery Storage Capacity: 13 megawatts (MW) / 15 MWh

MECO Customers on Moloka'i: 3,200

PPA Term Length: 22 Years

Cost Per kWh: 18 cents per kilowatt-hour (\$0.18/kWh)

kWh rate for MECO Residential Customers (Moloka'i):
\$0.37/kWh (May 2019)



Kuihelani Solar

Location: Central Maui

Owner/Operator: ES Renewable Energy

Date Project Online: Approved by PUC March 2019. Construction projected to begin in 2020, projected to go online by 2022

Land Siting: Former sugar fields off Kuihelani Hwy (South of E.Waiko Rd Intersection)

Land Acreage: Approx. 500 acres

Generating Capacity: 60 megawatts (MW)

Cost Per kWh: 8 cents per kilowatt-hour (\$0.8/kWh)

Projected # of Solar Panels: 200,000

Goal: To replace aging Kahului Power Plant, which produces about 40 MW of firm power



- Expected to provide clean energy for nearly 27,000 Maui homes per year and offset nearly 2 million barrels of fuel over life of contract

Paeahu Solar

Location: South Maui

Owner/Operator: Innergex

Date Project Online: Under PUC Review

Estimated Construction Start: Q2 2021

Estimated Online: Q2 2022

Landowner: Ulupalakua Ranch

Land Acreage: 200 acres

Generating Capacity: 15 megawatts (MW)

Battery Storage Capacity: 60 MWh

Cost Per kWh: 2 cents per kilowatt-hour
(\$0.12/kWh)

Operation Length: 25-Year PPA Timeframe



- Project would power about 7,300 Maui households

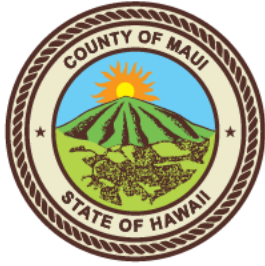
2nd Phase of Requests for Proposals (RFPs) for Hawaiian Electric Companies



→ Generation and storage is needed to prepare for the ***planned retirement of Kahului Power Plant*** by end of 2024

→ New RFPs will enable renewable generation, energy storage and grid services at competitive, reasonable cost with reliability.

→ **2nd Round of RFPs projected to be online as early as 2022:**
Maui: 135 MW renewable generation paired with energy storage
Molokai: Targeting 4 MW solar or 3.6 MW small wind paired with energy storage
Lanai: Targeting 9.5 MW solar paired with energy storage



Additional County of Maui Energy Highlights

- Adopted **2015 International Energy Conservation Code (IECC)** establishing new chapter 16.16B in Maui County Code (Adopted March 25, 2019; Ordinance in effect as of June 23, 2019). This will drive improved energy efficiency in new construction and major renovations.

- County of Maui exploring **Energy Savings Performance Contracting (ESPC)** opportunities with the goals of:

- Improving **energy efficiency** and **energy conservation** of County facilities
- Increasing deployment of **renewable energy generation and storage**
- Increasing **electric vehicle (EV) charging infrastructure and clean fleet**

- Exploring how to increase **energy resilience** of Maui communities through strategies such as deploying community **resilience hubs** that help to address **equity** and **disaster preparedness**

Transition County Fleet to 100% Renewable by 2035



→ County of Maui pledged to transition all fleet vehicles to **100% renewable power by 2035**

→ Considering participation in EV Suitability Assessment through **Climate Mayors Electric Vehicle Purchasing Collaborative to assess fleet vehicles for EV conversion**

→ Supports establishment of **joint procurement** for state and counties to take advantage of wider availability of new technology vehicle models

→ Supports amending HAR to allow **“piggybacking”** so state and counties can join an existing EV procurement (e.g. Climate Mayors procurement)

→ **HB401** allows public agencies to enter into **energy performance contracts** to implement energy conservation or alternate energy measures for vehicles and vehicle fleets. Amends definition of energy performance contract to include **vehicles, vehicle fueling/charging infrastructure, and vehicle fleets.**

Definition of Resilience

The ability of our community to anticipate, accommodate, and **positively adapt to or thrive** amidst changing climate conditions or hazard events and **enhance quality of life**, reliable systems, economic vitality, & conservation of resources for present & future generations.



Source: Urban Sustainability
Directors Network

Shocks and Stressors

SHOCKS
Typically considered single event disasters
Fires
Hurricanes
Earthquakes
Floods

STRESSORS
Factors that pressure on a daily or reoccurring basis
Endemic Violence
High Unemployment
Endemic Drug Use
Poverty

Focus on both shocks and stresses to enhance community adaptive capacity and resilience, especially in vulnerable areas

Source: Urban
Sustainability Directors
Network

General Definition- Resilience Hub

- Consists of a building or set of buildings and outdoor space that provide backup electricity, access to resources such as food, water, ice, charging stations, etc. and could possibly act as temporary shelter.
- **Support community cohesiveness**, before, during and after disruption.
- Strengthen communities and provide resources, programming, services and support.
- Resilience Hubs require governments and stakeholders to willingly **shift power** over to members of the community.





Community Desire and Support:

"A Resilience Hub can only be effective if community members actively engage in co-development..."



The Building(s):

"An existing well-used and well-trusted site (building) is the core of a Resilience Hub."



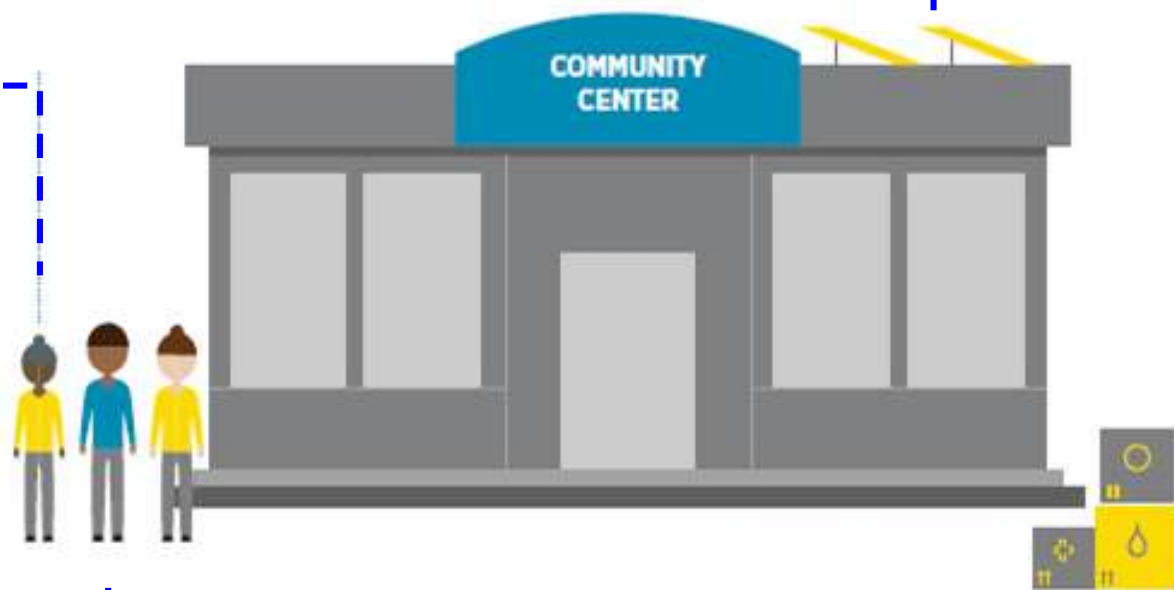
Energy Systems:

"Resilience Hubs need to host cost-effective onsite power systems capable of reliably sustaining operations during an extended power outage."



Community Uses:

"Resilience Hubs, defined and led in partnership with members of the community, should meet the unique needs of residents and organizations in that neighborhood."

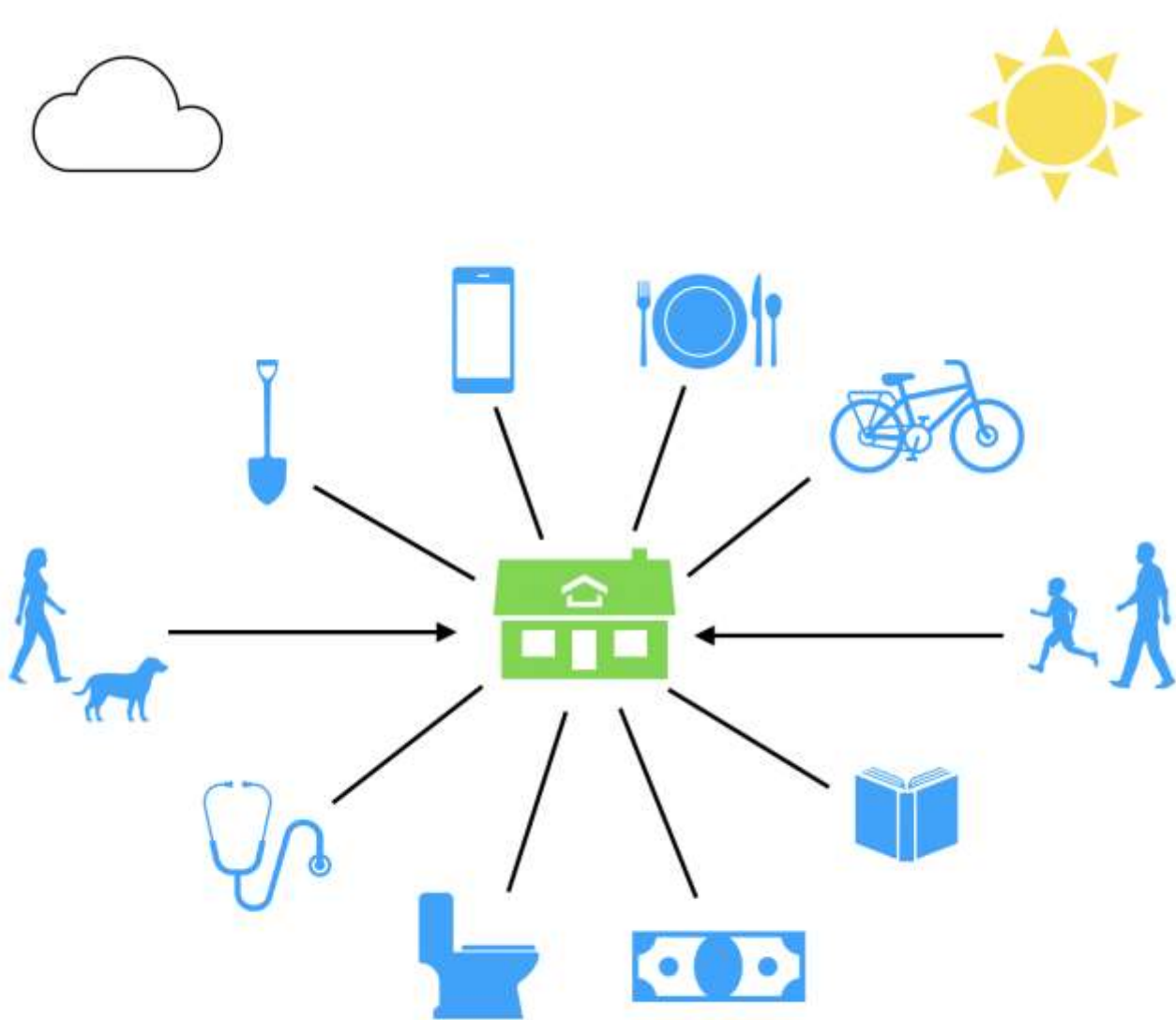


Resources to Meet Community Needs During Extreme Events:

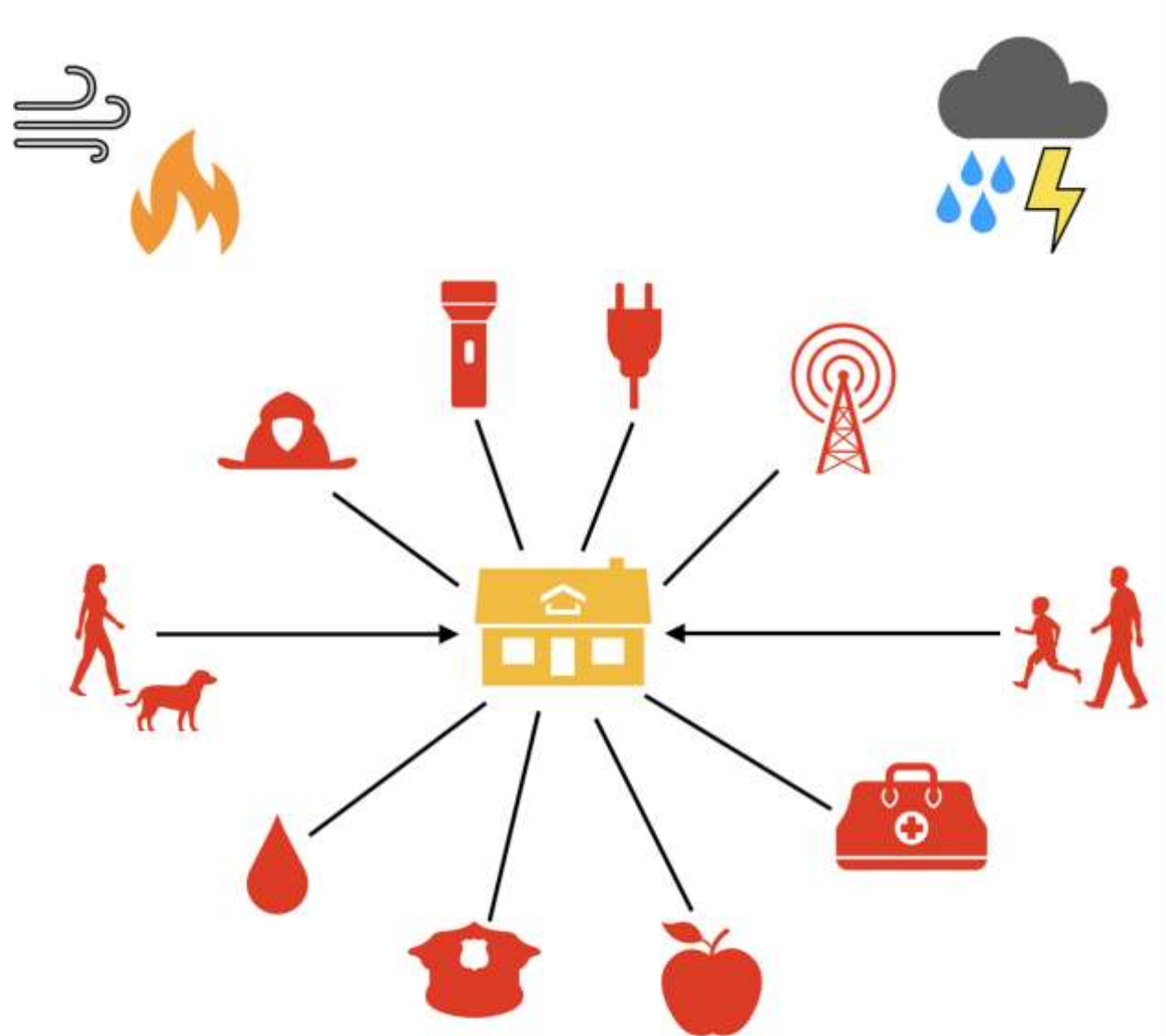
"In addition to providing shelter and electricity, each Resilience Hub should maintain a supply of and provide access to freshwater and resources such as food, ice, refrigeration, charging stations, basic medical supplies, and other supplies needed in the event of an emergency."

Key Components

Source: Urban Sustainability Directors Network



Examples of services that could be provided by a community resilience hub during non-emergency conditions



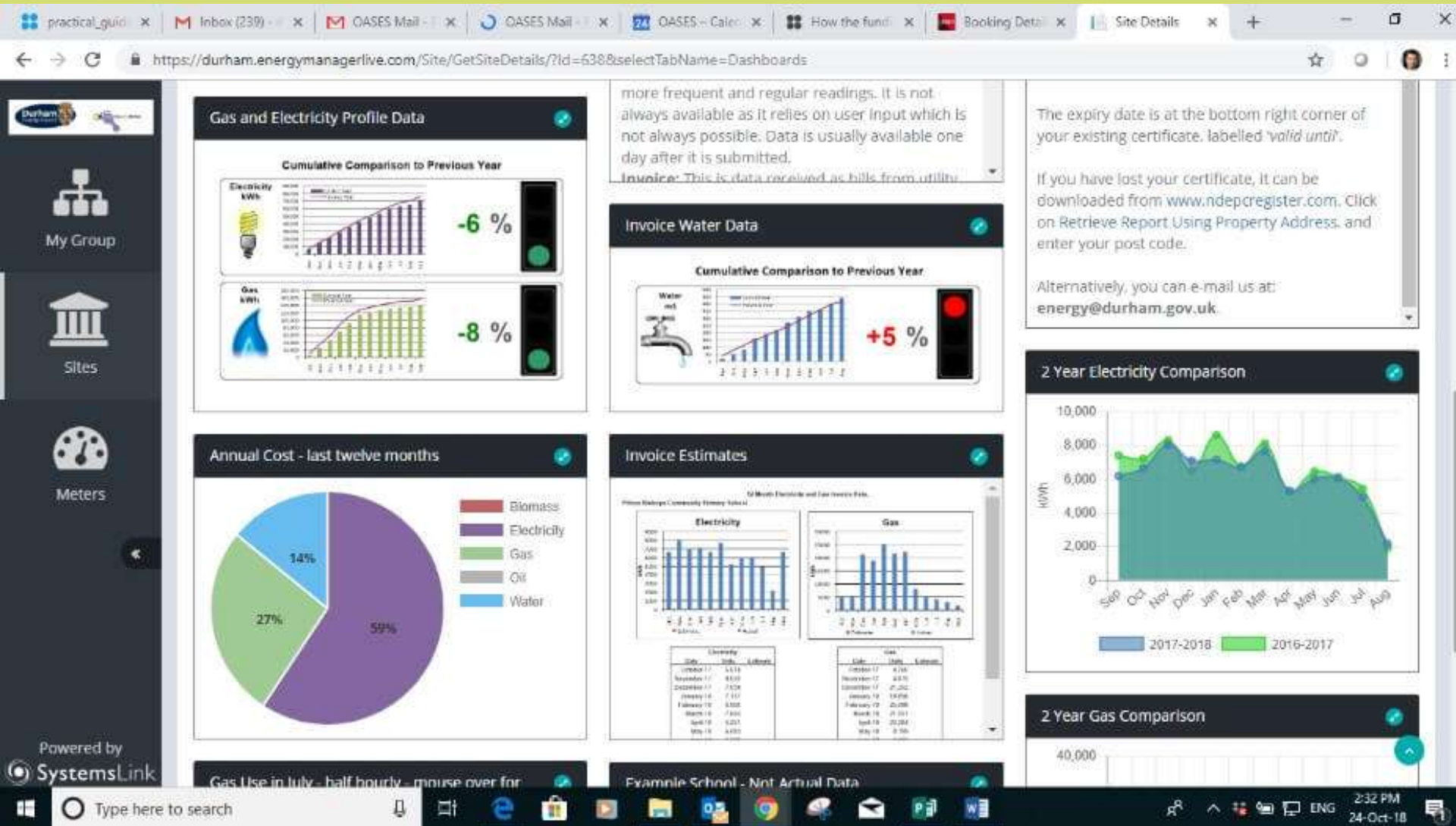
Examples of services that could be provided by a community resilience hub during emergency conditions

Resilience Hubs

- Community outreach and engagement sessions held September 2019
- Resilient Power Feasibility Assessment Pilot Projects:
 - Velma McWayne Santos (Wailuku) Community Center
 - Lahaina Civic Center
 - Hana Community Center



County of Maui Energy Dashboard



County of Maui Stats:

Over 600 MECO Accounts
CY18: Over 66 million kWh
CY18: Over \$23M

MAHALO NUI LOA



Alex de Roode
Energy Commissioner
County of Maui