TOGETHER

BUILDING A STRONGER HAWAI'I

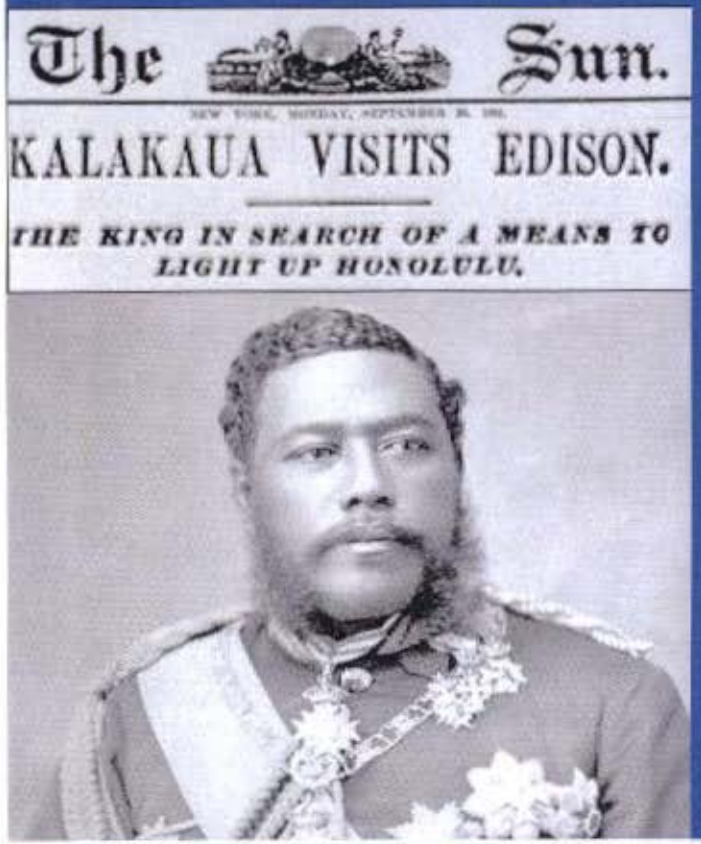
Hawaiian Electric

RECEIVED AT EACP MEETING ON 1/7/2020

Malina Martin, HECO

99 Years of Service

King David Kalakaua



The Sun.

KALAKAUA VISITS EDISON.

THE KING IN SEARCH OF A MEANS TO LIGHT UP HONOLULU.

1800s
King Kalakaua visits Thomas Edison

1881
Electricity used at Spreckels Mill on Maui:
First place to demonstrate electric lights in Hawai'i

1886
`Iolani Palace becomes first royal residency
to use electricity in the world

1921
Maui Electric Company opens its doors

2019
Transition to one name - Hawaiian Electric

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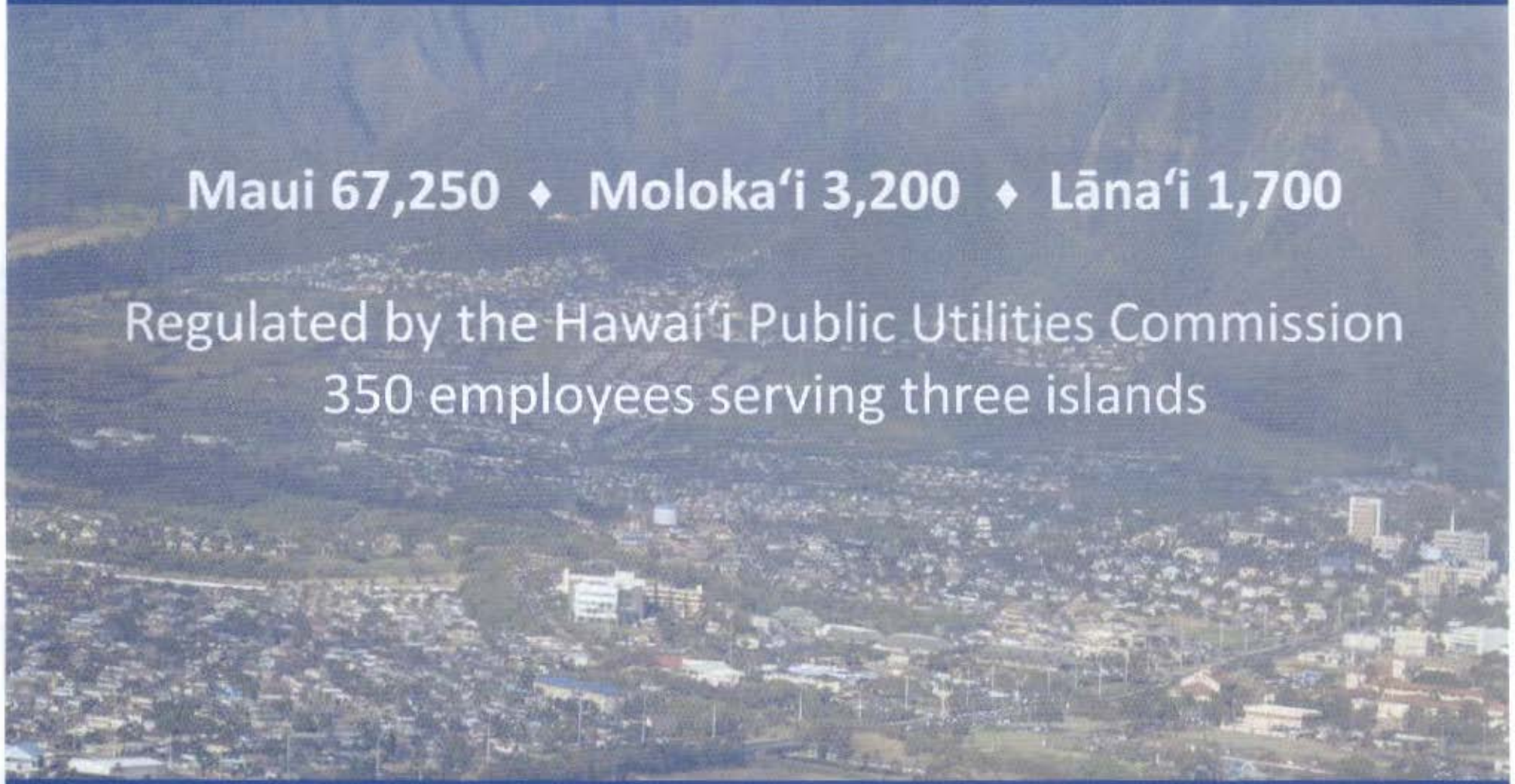
Serving 72,000 residential and commercial customers



Maui 67,250 ♦ Moloka'i 3,200 ♦ Lāna'i 1,700

Regulated by the Hawai'i Public Utilities Commission
350 employees serving three islands

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Growth = More Energy Needs

Maui's population

1980 – 71,600

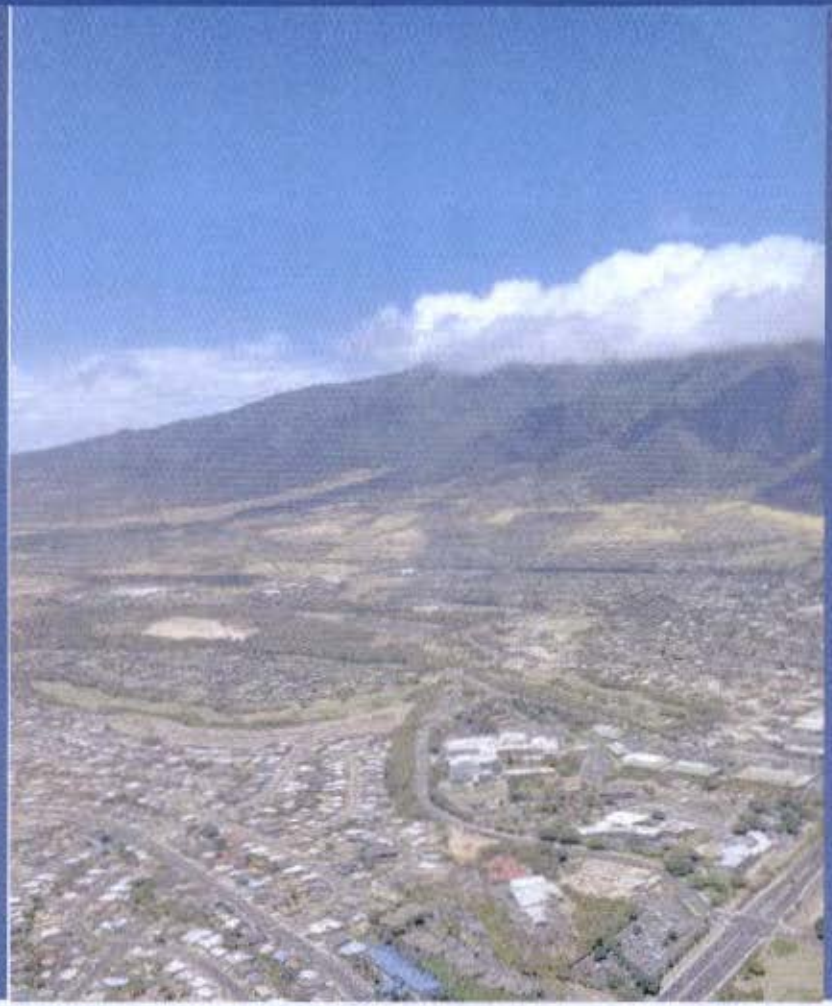
1990 – 101,709

2016 – 165,474

***2035 – 197,800**

***2045 – 211,500**

*(*State DBEDT projection)*



Over 45 projects expected

- Maui Business Park
- Maui Bay Villas (former Maui Lu)
- Kīhei high school
- Residential Developments

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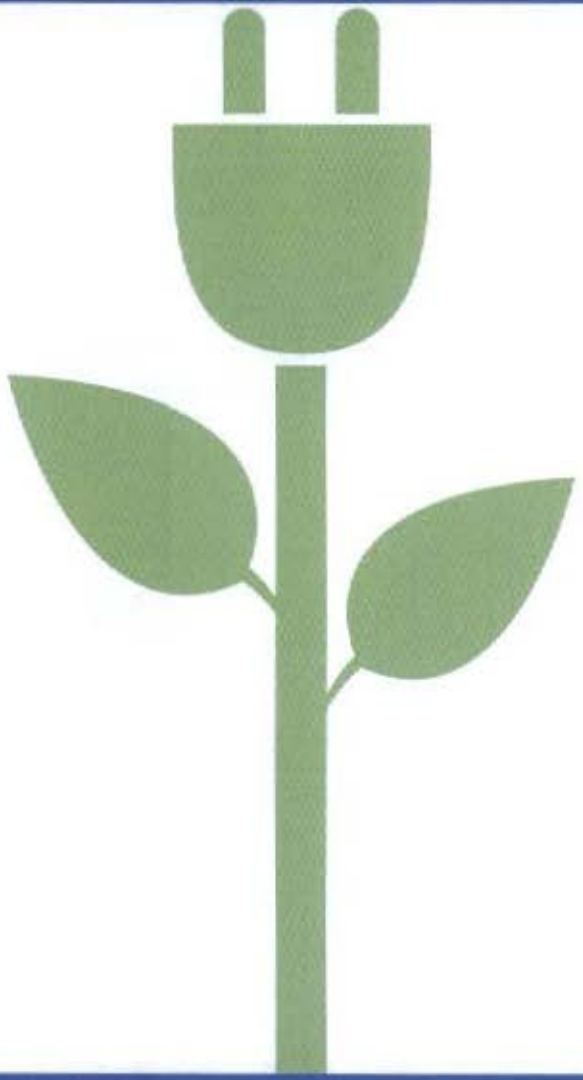
Key Planning Principles



1. Renewable energy is the first option.
2. The energy transformation must include everyone.
3. Today's decisions must not crowd out tomorrow's breakthroughs.
4. The power grid needs to be modernized.
5. The lights have to stay on.
6. Our plans must address climate change.
7. There's no perfect choice.

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Unique Challenges

COST	• Customer savings will be in future
LAND	• Projects require use of large areas of land
IMPACT	• To community, environment
COMPLEXITY	• Technical and operational requirements to ensure safety and reliability for five separate island grids
ACCEPTABILITY	• Public acceptance of renewable resource, technology used, cost, land use
REGULATORY	• Requires review and approval by State Public Utilities Commission

Keeping Our Islands Powered

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One Megawatt (MW)

1 MWh

1MW of energy

for one hour

1 MW powers:

About 100,000
compact florescent light bulbs

About 800
average homes on Maui

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Energy Use on Maui, Molokaʻi, Lānaʻi

Maui

About 20,000 MWh per week

Highest energy use at 208.9 MW

Molokaʻi

About 623 MWh per week

Highest energy use at 5.9 MW

Lānaʻi

About 600 MWh per week

Highest energy use at 5.9 MW

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Power Generation - Maui

Firm

Mā'alaea Power Plant
212 MW

Kahului Power Plant
34 MW

Hāna Substation
2 MW

As-available

Privately-owned Wind Projects

Kaheawa I: 30 MW
Kaheawa 2: 21 MW
Auwahi: 21 MW

Privately-owned Solar Projects

Kuia: 2.87 MW
SMRR: 2.87 MW

Private Rooftop Solar Systems

Over 100 MW

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Power Generation – Moloka'i and Lāna'i

Firm

Pālā'au Power Plant
12 MW

Miki Basin Power Plant
9.4 MW

Mānele Bay Combined Heat & Power
1 MW

As-available

Privately-owned Solar Projects

Moloka'i New Energy Partners *(awaiting construction)*
2.7 MW + 2 MW Battery Energy Storage System

Lāna'i Sustainability Research
1.2 MW + 1 MW BESS

Private Rooftop Solar Systems
3 MW

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Our Renewable Energy Future

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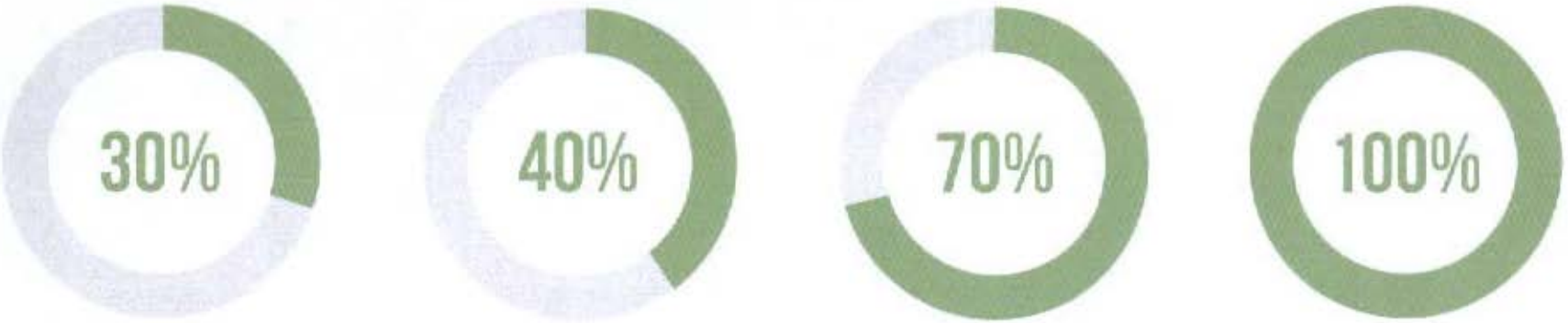
100% Renewable Energy

Hawai'i has one of the nation's most ambitious energy goals

100 percent of electricity sales will come from renewable resources by 2045



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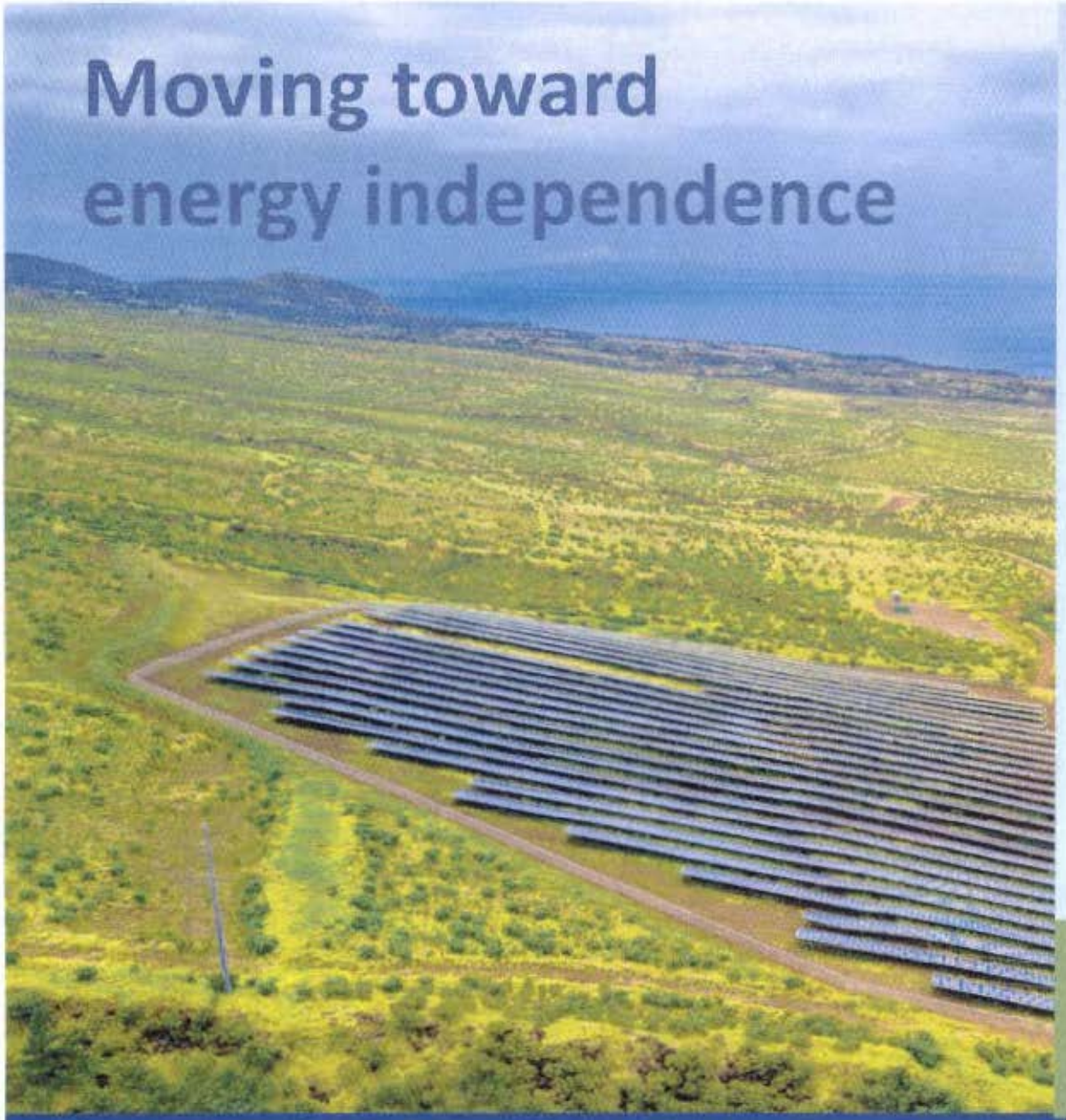
Moving toward energy independence



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 2018

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Private rooftop photovoltaic (PV) solar systems on the five islands Hawaiian Electric serves

2007 370

2019 79,187

Private rooftop solar systems in 2019 in Maui County: More than 12,000 systems

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Taking Steps to Transition Our Grid for More Renewable Energy

Large scale renewable energy projects will be needed to help provide enough power to meet demand including the planned retirement of power generation from the Kahului Power Plant

2016

Issued Request for Information (RFI) for land owners interested in offering site options to developers

2017

Phase 1 Request for Proposals (RFP) for renewable projects

2019

Phase 2 Request for Proposals for renewable projects

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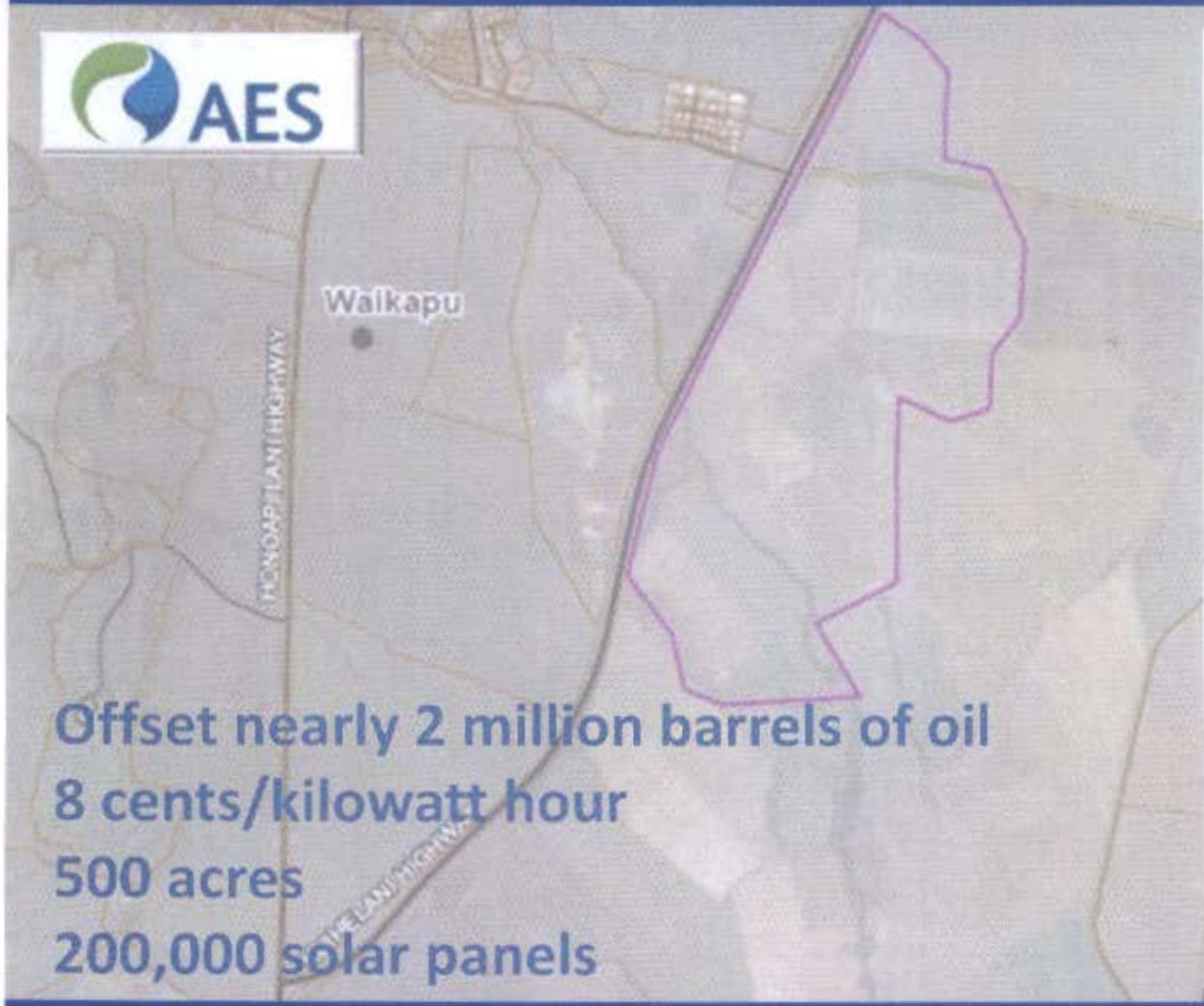
Phase 1 Request for Proposals Resulted In Largest Solar + Battery Project in State



The Maui News

Maui's largest solar project OK'd by PUC

Island's other large-scale array, battery proposal awaits approval

By **LEE IMADA**, Managing Editor

Maui County's largest solar project with battery storage, the 60-megawatt Kuihelani Solar, was approved by the state Public Utilities Commission, Hawaiian Electric Co. announced Tuesday.

AES Renewable Energy is developing the project to be built on as much as 500 acres of old sugar fields off Kuihelani Highway in Central Maui, the company said in November. It will include a 240-megawatt-hour battery storage system.

Maui Electric Co. will pay 8 cents a kilowatt hour for the power from the solar array and battery system, the lowest cost for renewable energy on the island and much lower than fossil-fuel-generated power.

"AES is excited about the PUC approval of its solar-plus-storage project in Central Maui, which is expected to provide enough clean energy for nearly 27,000 Maui homes per year, anticipated bill savings to Maui residents and offset nearly 2,000,000 barrels of fuel over the life of the contract," said Rob Cooper, business development director of AES Renewable Energy, on Friday.

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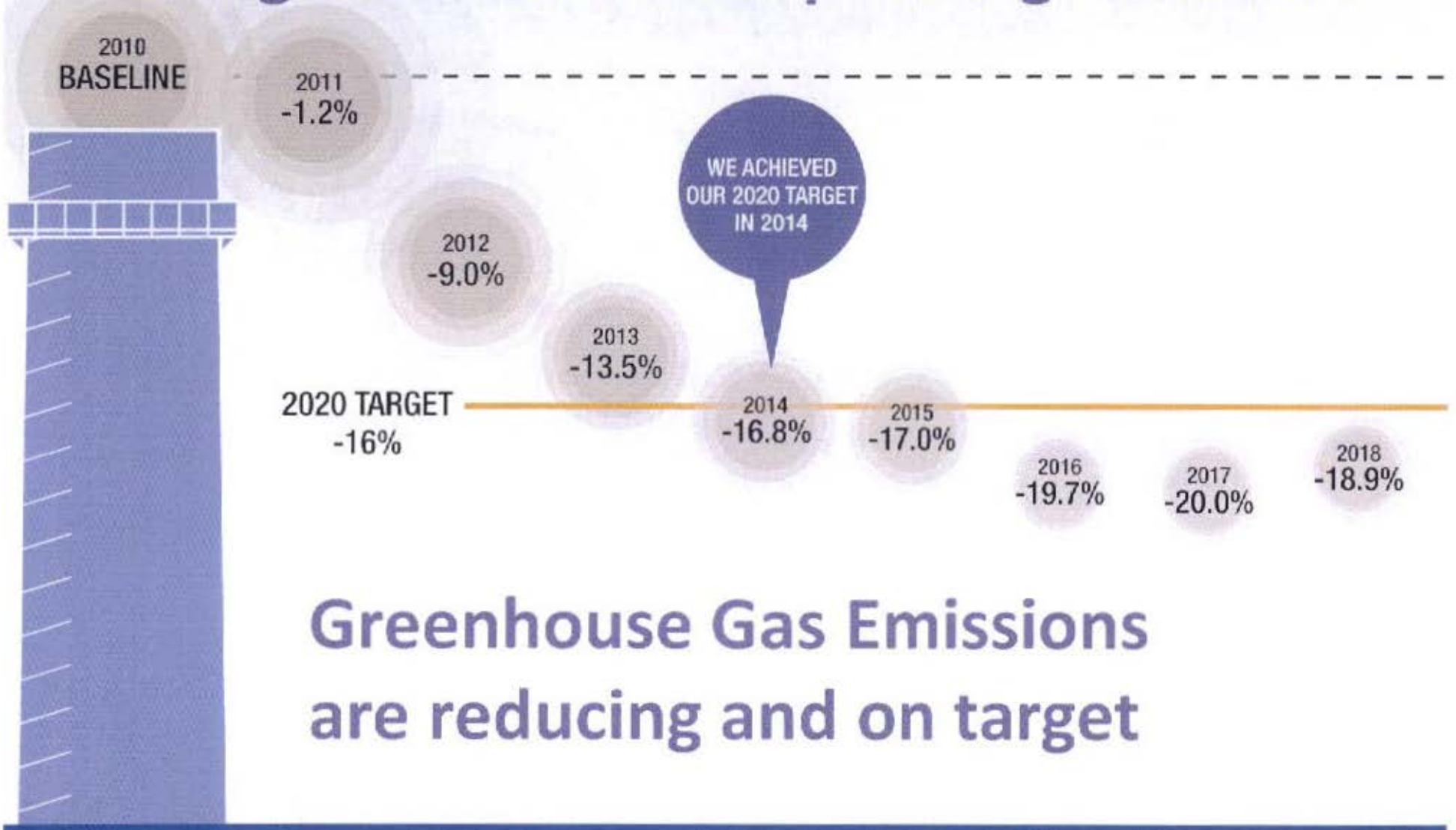
Using 20% less oil for power generation



Greenhouse Gas Emissions are reducing and on target

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Retiring Kahului Power Plant

Kahului Power Plant generates about 34 MW with fossil fuel that will need to be replaced in several years.

To replace that same amount of firm power generation and meet the island's projected future energy needs with solar and battery energy storage it could require

700 acres ♦ 14 War Memorial Stadium Complexes

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Modernizing the Grid
and
Maintaining Safe and Reliable Energy

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Modernizing the Electric Grid

New technology to improve reliability and integrate more renewable energy onto existing grid

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Planning for Integration of More Renewable Technology

Implementation of an intensive, multi-year integrated grid planning process involving six working groups representing industry, government, community representatives.

Community outreach planned for 2020 to share outcome of working groups.

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Preventing Risks to Reliability

VEGETATION MANAGEMENT

Spent $3.2 million to clear and trim brush, trees, and branches around the company's equipment and facilities.

Coordination with landowners when electrical infrastructure is on private property.

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Strengthening our System

Hendrix Aerial Cable System keeps lines up as trees and branches fall in storm conditions

Spring 2019

Successful cable and pole replacement pilot in Olinda

2020:

Lahainaluna Road East Moloka'i

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Wildfire Mitigation

Drones are used to assess remote and drier areas, including West Maui and upper Mā'alaea, with a focus on drought-prone areas where large amounts of dry grass and brush exist.

In fire prone areas, fire retardant is applied to poles, fire breaks maintained and vegetation that can add to fire risk are mitigated.

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Our Partnership with the County and Community

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TOGETHER

BUILDING A STRONGER HAWAI'I

Mahalo

What questions can we help with?