

Appendix A: Stakeholder Feedback and Public Input

1 Stakeholder Feedback and Public Input

1.1 Stakeholder Council

The Stakeholder Council met a total of 23 times between August 2018 and December 2022, discussing various topics on Integrated Grid Planning. The following table includes a list of meeting dates, links to presentation materials and notes. This information is also available within the [Key Stakeholder Documents Library](#).

Meeting Date	Materials	Notes
August 30, 2018	General Presentation	Meeting Summary
November 8, 2018	General Presentation	Meeting Summary
January 22, 2019	General Presentation	Meeting Summary
February 20, 2019	General Presentation	Meeting Summary
May 8, 2019	General Presentation	Meeting Summary
August 23, 2019	General Presentation	Meeting Summary
November 7, 2019	General Presentation	Meeting Summary
January 16, 2020	General Presentation	Meeting Summary
March 12, 2020	General Presentation	Meeting Summary
June 1, 2020	General Presentation	Meeting Summary
August 18, 2020	General Presentation NREL Solar and Wind Resource Final Study NREL Solar and Wind Resource Potential Study	Meeting Summary
March 9, 2021	General Presentation Stakeholder Council Framework Pre-Read Stakeholder Council Meeting Docket 2018-0165	Meeting Summary
March 29, 2021	General Presentation	Meeting Summary
April 27, 2021	General Presentation	Meeting Summary
June 18, 2021	General Presentation SWITCH Analysis Presentation	Meeting Summary
June 23, 2021	General Presentation NREL Assessment of Wind and Photovoltaic Technical Potential Report Preliminary Agenda for June 30, 2021 Island-Wide PSCAD Study Meeting	Meeting Summary
October 28, 2021	General Presentation Technical Advisory Panel Update Presentation	Meeting Summary Meeting Recording
November 9, 2021	General Presentation Resilience Working Group Recap Stakeholder Council Pre-Read	Meeting Summary Meeting Recording
January 24, 2022	General Presentation	Meeting Summary Meeting Recording
May 18, 2022	General Presentation Progress Update Presentation	Meeting Recording
September 29, 2022	General Presentation	Meeting Recording
November 30, 2022	Joint Stakeholder Council and Technical Advisory Panel Meeting Presentation	Meeting Recording
December 5, 2022	General Presentation	Meeting Recording

1.1.1 Stakeholder Toolkit

The purpose of the Stakeholder Toolkit is to provide public-friendly materials for Stakeholder Council Members to use when discussing Hawaii Powered. The use of materials throughout engagement helps to provide consistent branding and messaging. Two toolkits were provided to the Stakeholder Council including in 2020 and 2022.

- Toolkit – Overview Presentation with talking points (shown below)
- Toolkit – Frequently Asked Questions
- Toolkit – Hawaii Powered Handout
- Toolkit – Engagement Opportunities Flier

The image shows two overlapping presentation slides. The top slide is white with a green and blue geometric pattern on the right. It features the title 'Introducing: Hawai'i Powered' and the subtitle 'Clean energy for Hawai'i, by Hawai'i'. It includes two call-to-action boxes: one with icons for a laptop and envelope, and another with icons for a speech bubble and a play button. The bottom slide is dark purple with a white and green geometric pattern on the right. It features the title 'Watch the Hawai'i Powered Welcome Video: www.hawaiipowered.com' and a video player interface with a play button and the text 'Hawai'i Powered'. Both slides include the Hawaiian Electric logo in the bottom left corner.

Introducing: Hawai'i Powered
Clean energy for Hawai'i, by Hawai'i

Visit our online participation site and sign up for email updates:
www.hawaiipowered.com

Contact us or request a presentation:
IGP@hawaiianelectric.com

Watch the
Hawai'i Powered
Welcome Video: www.hawaiipowered.com

Hawai'i Powered

1.1.2 Stakeholder Toolkit Materials

The following pages show images of display boards, informational and frequently asked question handouts, and presentations slides.

Getting to 100% Renewables

Join Us At Our
Public Meetings
5 – 7:30 pm



Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

Agenda

PART 1 Open House
5 – 6 pm

PART 2 Panel Discussion
6 – 7:30 pm

Dates & Locations

TUESDAY Mar 03 Kealahou High School (Cafeteria)
74-5000 Puohulihuli Street
Kailua-Kona, Hawai'i 96740

TUESDAY Mar 10 Hawaii Pacific University*
(Multi-Purpose Room 3)
1 Aloha Tower Drive
Honolulu, O'ahu 96813
**Free parking with validation*

THURSDAY Mar 05 Hilo High School (Cafeteria)
556 Waiānuenuē Avenue
Hilo, Hawai'i 96720

THURSDAY Mar 12 Hawaiian Electric (Kahului Auditorium)
210 W. Kamehameha Avenue
Kahului, Maui 96732



• Pupus will be provided • Check out our careers station

VIRTUAL OPEN HOUSE

Can't join us? Then visit our Virtual Open House between March 2–20, 2020 at www.hawaiianelectric.com/igp

WE WANT TO HEAR FROM YOU

We welcome your input!
Here are the many ways to stay connected with us.

Email:
IGP@hawaiianelectric.com



Website:
www.hawaiianelectric.com/igp



Hawai'i's Renewable Energy Future Series Getting to 100% Renewables

Join Us At Our
Community Meeting
5 – 7:30 pm

>>> Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

TUESDAY **Mar 03** **Kealakehe High School (Cafeteria)**
74-5000 Puohulihuli Street
Kailua-Kona, Hawai'i 96740

THURSDAY **Mar 05** **Hilo High School (Cafeteria)**
556 Waiānuenue Avenue
Hilo, Hawai'i 96720

Pupus will be provided at both community meetings

PART 1 Open House Stations 5 – 6 pm

Eight (8) informational stations to browse and ask questions:

1. Integrated Grid Planning (IGP)
2. Grid Modernization
3. Grid Scale Renewables
4. Rooftop Renewable Energy
5. Community-Based Renewable Energy
6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART 2 Panel Discussion 6 – 7:30 pm

Panel Participants

- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning and Technology
- Hawaiian Electric | Kevin Waltjen, Director, Hawai'i Island
- Hawaiian Electric | Lisa Dangelmaier, Director, System Operations, Hawai'i and Maui
- County of Hawai'i | Riley Saito, Deputy Director, Research and Development
- Geometrician Associates | Ron Terry, Principal
- Community | Carol Ignacio

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Website:
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**Hawaiian
Electric**

Getting to 100% Renewables

Join Us At Our Public Meetings

5 – 7:30 pm



Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

TUESDAY

Mar
10

Hawaii Pacific University* (Multi-Purpose Room 3)
1 Aloha Tower Drive, Honolulu, O'ahu 96813

*Free parking with validation

Pupus will be provided

PART
1

Open House Stations 5 – 6 pm

Eight (8) informational stations to browse and ask questions:

1. Integrated Grid Planning (IGP)
2. Grid Modernization
3. Grid Scale Renewables
4. Rooftop Renewable Energy
5. Community-Based Renewable Energy
6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART
2

Panel Discussion 6 – 7:30 pm

Panel Participants

- Community | Cynthia Rezentes, Nanakuli Neighborhood Board Chair
- Ulupono Initiative | Murray Clay, President
- O'ahu Economic Development Board | Pono Shim, President & CEO
- City & County of Honolulu | Josh Stanbro, Chief Resilience Officer & Executive Director, Office of Climate Change, Sustainability & Resiliency
- Hawai'i Farm Bureau | Brian Miyamoto, Executive Director
- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning and Technology

VIRTUAL OPEN HOUSE

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IGP@hawaiianelectric.com



Website:

www.hawaiianelectric.com/igp



Hawaiian
Electric

Maui's Renewable Energy Future Series Getting to 100% Renewables

Join Us At Our
Community Meeting
5 – 7:30 pm

>>> Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

THURSDAY
Mar
12

Hawaiian Electric (*Kahului Auditorium*)
210 W. Kamehameha Avenue
Light refreshments will be provided

PART
1

Open House Stations 5 – 6 pm

Eight (8) informational stations to browse and ask questions:

1. Integrated Grid Planning (IGP)
2. Grid Modernization
3. Grid Scale Renewables
4. Rooftop Renewable Energy
5. Community-Based Renewable Energy
6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART
2

Panel Discussion 6 – 7:30 pm

Panel Participants

- **Rhiannon Chandler-'Iao**, Executive Director, Waiwai Ola Waterkeepers Hawaiian Islands
- **Colton Ching**, Senior Vice President, Planning and Technology, Hawaiian Electric
- **Rebecca Dayhuff Matsushima**, Director, Renewable Acquisitions, Hawaiian Electric
- **Dick Mayer**, Coordinator, Alliance for Maui Community Associations
- **Michele McLean**, Director, Department of Planning, County of Maui

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**Hawaiian
Electric**

Customer Priorities

We're Listening

In response to engagement, surveys, and focus groups, we were told affordability, reliability, and energy choices are most important to customers.

Affordability

Lower energy bills



Reliability

Fewer outages



Energy Choices

More control over energy generation and use

Is this true for you?

Let us know if you have different opinions. We're using this information to help make smart future energy decisions for customers.

WE WANT TO HEAR FROM YOU

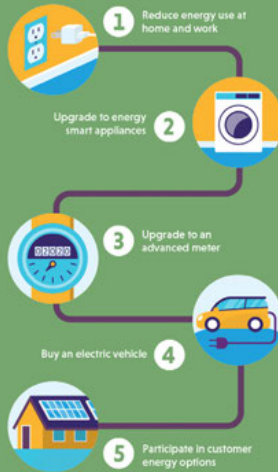
We welcome your input! Here are the many ways to stay connected with us.

Email: IGP@hawaiianelectric.com

Website: www.hawaiianelectric.com/igp



5 Ways Customers Can Help Hawai'i Reach 100% Renewables



Visit hawaiianelectric.com/products-and-services/ to learn more ways you can help.



Integrated Grid Planning

Listening • Integrating • Collaborating to Reach 100% Renewables by 2045

What is IGP?

Be part of the Integrated Grid Planning (IGP) conversation to shape our renewable energy future together.

Our Energy Future



Achieve Energy Independence

Reduce oil dependency and volatile fuel costs by increasing renewables



Climate Change Considerations

Add more renewables to reduce greenhouse gas emissions and build a resilient grid



Modernize Our Island Grids

Integrate new technologies to facilitate 100% renewable energy

Our Goal for the Future: 100% Renewables by 2045



*RPS = Renewable Portfolio Standard

How Does This Benefit Our Customers?



More options to control and lower bills

Time-of-Use rates to save money and lower fuel and maintenance costs



Financial incentives for purchasing an electric vehicle

Benefits of solar energy by offsetting bills without installing PV panels on their property



Integrate higher levels of renewables into the modern grid

Faster power outage restoration with greater convenience



Improved efficiencies and integration of renewables

What Do We Need to Consider?

Integrated Grid Planning looks into the best technology options for all aspects of our energy system and identifies energy needs and behaviors of future customers taking into consideration key factors.



Participating in the Process

As part of the IGP process, we are collecting your input and considering all our options in planning for our renewable future. Here are the participants Hawaiian Electric is collaborating with:

Working Groups

Address specific topics in an advisory capacity and not as a decision-making group

Stakeholder Council

Represents customers and broad stakeholders to review work and provide guidance and insights

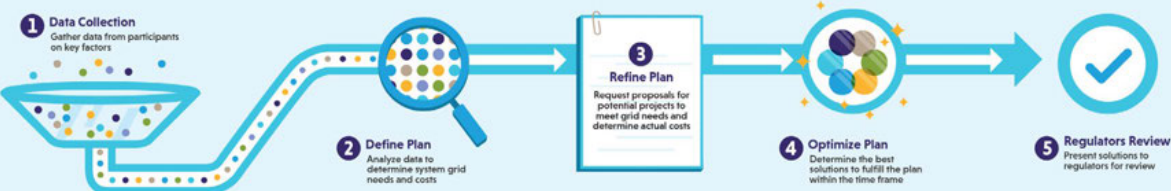
The Public

Communication with customers

Technical Advisory Panel

Provides independent evaluation and feedback on the working group activities and review point filings

How Do We Get There? Integrated Grid Planning



Getting to 100% Renewables

1

This presentation covers information on Hawaiian Electric's Integrated Grid Planning with a focus on how the process plays a role in helping us reach our 100% renewable energy goal

Our Goal for the Future: 100% Renewables by 2045




2

*RPS = Renewable Portfolio Standard


In 2015, our state made a commitment to our clean energy future of getting to 100% renewables by 2045.

As you can see by this chart – we, collectively, have significant changes to make in order to achieve this goal. It will take a collaborative and integrated process for the state of Hawaii to completely transform the way we generate, transfer and use energy across our state. We need to make changes today and incrementally over the next 25 years to reach our goal.


Our Energy Future



Achieve Energy Independence
Reduce oil dependency and volatile fuel costs by increasing renewables




Climate Change Considerations
Add more renewables to reduce greenhouse gas emissions and build a resilient grid



Modernize Our Island Grids
Integrate new technologies to facilitate 100% renewable energy

3



Each of us has a unique vision of our energy future. As Hawaiian Electric looks toward the future – they are looking at three key areas:

- First, achieving energy independence by reducing our dependency on oil and volatile fuel costs by increasing renewables.
- Second, making sure that we’re considering climate change by adding more community and large-scale renewables to our energy grid and building a stronger, more resilient grid.
- Third, modernizing our grid. We need to build a smart energy system using new technologies that enable us to transform how we generate, deliver and use our energy. These upgrades will create a smarter and more flexible energy grid allowing us to increase renewables.

5 Ways Our Customers Can Help Hawai‘i Reach 100% Renewables

1



Reduce energy use at home and work

2



Upgrade to energy smart appliances

3



Upgrade to an advanced meter

4



Buy an electric vehicle

5



Participate in customer energy options

4

Visit hawaiianelectric.com/products-and-services/ to learn more ways you can help



We each play a role in meeting Hawaii’s energy goals. It is important for us to think about the energy we produce and use, everyday, as a complete energy system.

Here are five steps – large and small – that will help customers conserve energy, monitor energy use, and generate renewable energy. Visit hawaiianelectric.com/products-and-services/ to learn more ways you can help.

What is IGP?

Integrated Grid Planning (IGP) is an **energy planning process** to identify the best options for our customers to move Hawai'i toward a clean energy future.

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So what is IGP?

It's an energy planning process. Similar to a business strategic planning process, Hawaiian Electric gathers data and develops a plan to provide insights and directions for the future of the utility to meet customer needs, regulatory requirements and clean energy goals.

How Does This Benefit Our Customers?



More options to control and lower bills



Time-of-Use rates to save money and lower fuel and maintenance costs



Financial incentives for purchasing an electric vehicle



Benefits of solar energy by offsetting bills without installing PV panels on their property



Integrate higher levels of renewables into the modern grid



Faster power outage restoration with greater convenience



Improved efficiencies and integration of renewables

6



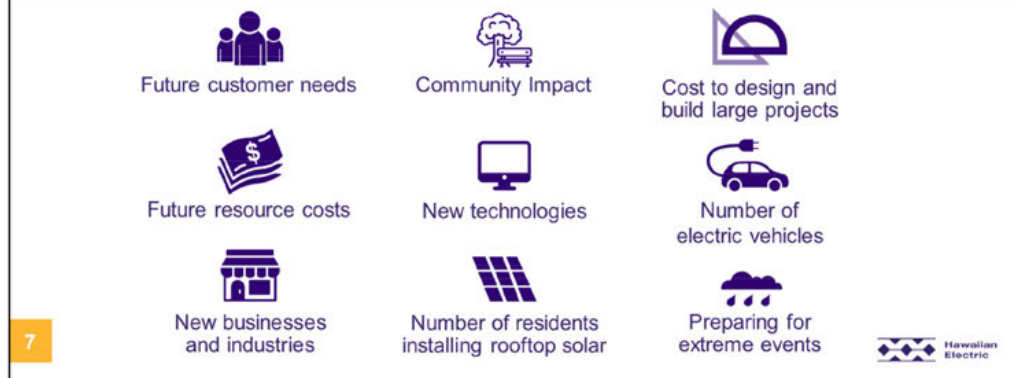
You may be asking – how does this benefit me/customers?

Hawaiian Electric is continually working ways to improve the customer experience including:

- Developing ways to modernize our grid
- Integrating time of use programs to conserve energy and save money
- Installing and integrating more rooftop and community solar
- Supporting the electrification of transportation system
- Identify opportunities and technologies to store energy

They are doing all of this while keeping customer's electric bills and service reliability in mind.

Factors to Consider in Planning for our Clean Energy Future



Several factors drive and impact the right solutions as we plan for our clean energy future.

The eight factors listed provide a snapshot of the type of information Hawaiian Electric gathers and considers during the planning process to help identify challenges and opportunities. Future costs for materials and fuel, the number of electric vehicles purchased, and the impact of natural disasters, all garner different solutions for Hawaiian Electric to consider.

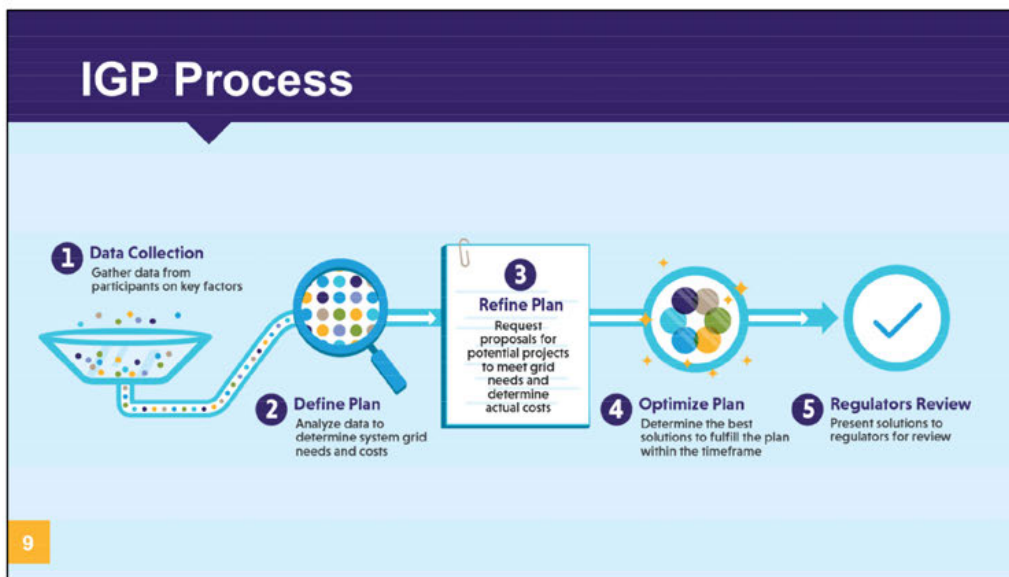
Participating in the Process

As part of the IGP process, we are collecting your input and considering all our options in planning for our renewable future. Here are the participants Hawaiian Electric is collaborating with:

<p>Working Groups</p> <p>Address specific topics in an advisory capacity and not as a decision-making group</p>	<p>Stakeholder Council</p> <p>Represents customers broad stakeholders to review work and provide guidance and insights</p>	<p>The Public</p> <p>Communication with customers</p>	<p>Technical Advisory Panel</p> <p>Provides independent evaluation and feedback on the working group activities and reviews point filings</p>
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An aspect of Integrated Grid Planning is working with several stakeholder groups to collect input and consider various options in planning for Hawaii's renewable future. Here are the participants Hawaiian Electric is collaborating with:

- Working Groups
- The Stakeholder Council
- The public
- A Technical Advisory Panel



Integrated Grid Planning has five major steps.


This is a two year planning process. Hawaiian Electric collects data from experts and stakeholders, including the public, on the various key factors shown earlier.

Data collected is analyzed and used to determine what the grid needs and may cost.

What is the Outcome of IGP?

Filed applications for projects & strategies used for long-term decision making

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In the Integrated Grid Planning process, Hawaiian Electric will develop a long term plan that will be submitted to the PUC for review. This plan will provide insights into long term decisions made for resources (generation), transmission (how power is transferred to customers) and distribution (how customers receive their energy). Hawaiian Electric will use the findings and identified solutions in the long term plan to inform procurements. The projects that emerge from the procurements will also be submitted to the PUC for review and used to update the long term plan.

Working Groups

- **Standardized Contracts (SCWG)**
Procurement of services through a contracting mechanism between Hawaiian Electric (utility) market operators and third party providers of grid and other ancillary services.
- **Competitive Procurement (CPWG)**
Procurement of resources in alignment with Hawaiian Electric's grid plans as identified through the IGP process.
- **Forecasts and Assumptions (FAWG)**
Support development of forecast assumptions and sensitivities as part of pre-IGP planning cycle activity, and provide strategic inputs and feedback on assumptions and methodologies used for load forecast development and results.
- **Distribution Planning (DPWG)**
Enhancement to the methods and tools for distribution planning and the integration with resource and transmission planning.
- **Grid Services (GSWG)**
Identify and define additional energy, capacity, ancillary and T&D non-wires alternative services.
- **Resilience (RWG)**
Support the development of resilience planning.
- **Solution Evaluation and Optimization (SEOWG)**
Identify needed grid services and review and make recommendations regarding the transparent evaluation and optimization method.

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There are 7 working groups collaborating on various aspects of the planning process. More information on each of these working groups can be found on the IGP website including upcoming scheduled meetings.

Join us at our Public Meetings 5–7:30 pm

Be part of **the Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

Agenda

- | | | | |
|---------------|-------------------------------|---------------|----------------------------------------|
| PART 1 | Open House
5 – 6 pm | PART 2 | Panel Discussion
6 – 7:30 pm |
|---------------|-------------------------------|---------------|----------------------------------------|

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Upcoming public meetings will be held in March 2020.

The public meetings will have two parts:

- 1) The open house will have eight stations to talk with Hawaiian Electric staff
- 2) The panel will include speakers with various perspectives on getting to 100% renewables. Audience members will have an opportunity to submit or ask questions of the panel members during the facilitated Q&A session.

Dates & Locations

TUESDAY
Mar 03
Kealahou High School (Cafeteria)
74-5000 Puuhuluhuli Street
Kailua-Kona, Hawai'i 96740

TUESDAY
Mar 10
Hawaii Pacific University*
(Multi-Purpose Room 3)
1 Aloha Tower Drive
Honolulu, O'ahu 96813
**Free parking with validation*

THURSDAY
Mar 05
Hilo High School (Cafeteria)
556 Waiānuenuē Avenue
Hilo, Hawai'i 96720

THURSDAY
Mar 12
Hawaiian Electric (Maui Auditorium)
210 W Kamehameha Avenue
Kahului, Maui 96732

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A series of four public meetings will be held on three islands.

We encourage each of you to share information with your networks about the upcoming meetings. It's important for customers to participate in this process for Hawaiian Electric to listen to customer questions or concerns and educate customers on Integrated Grid Planning.

Open House Stations

There will be eight (8 stations)



Integrated
Grid Planning



Grid
Modernization



Grid-scale
Renewables



Rooftop Renewable
Energy



Community-Based
Renewable Energy



Electrification of
Transportation



Resilience



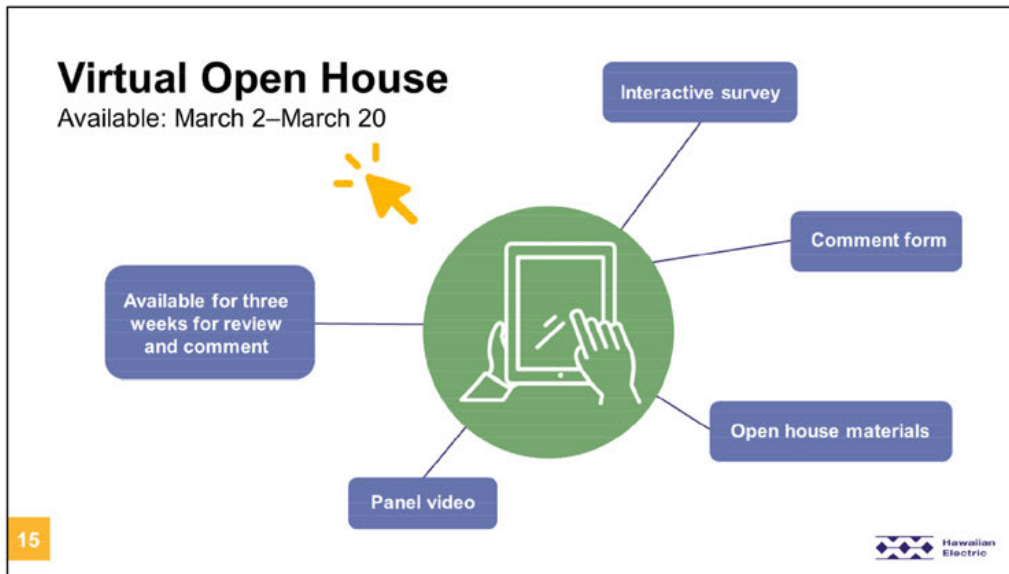
Careers at
Hawaiian Electric

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In addition to information on IGP, Hawaiian Electric staff will be available to talk about career opportunities and address questions about advanced meters and customer energy options.

Some of the stations will include survey input opportunities to help verify forecasted data and shape future engagement efforts.



In addition to the four in-person public meetings, a virtual open house will be available with the same information that is presented at each open house station. A panel discussion will be filmed and also available to watch. Visitors will have the opportunity to view materials, answer survey questions, and complete a comment form. The virtual open house will be made available through the IGP website and open March 2 – 20.

We Want to Hear From You

We welcome your input! Here are the many ways to stay connected with us.

Email: IGP@hawaiianelectric.com

Website: www.hawaiianelectric.com/igp

facebook.com/HawaiianElectric
twitter.com/hwnelectric
instagram.com/hawaiianelectric

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Hawaiian Electric's Integrated Grid Planning team is open to input and feedback. Feel free to send the team an email at IGP@hawaiianelectric.com and be sure to visit the IGP website for more information and links to documents, meeting notes and upcoming meetings and engagement opportunities. IGP information is also shared on Hawaiian Electric's social channels.

Introduction to:

Hawaiian Electric and Hawai'i Powered

What does Hawai'i Powered mean?

Hawaiian Electric calls its vision for using 100% local, clean energy, "Hawai'i Powered." Hawai'i Powered celebrates finding solutions for a clean energy future right here in Hawai'i.

Hawai'i Powered is built on three foundational elements:

1. Local, renewable energy sources
2. Integrating diverse sources and technologies for a resilient grid
3. Robust engagement with stakeholders and the communities we serve

What are benefits of a Hawai'i Powered future?

Clean energy for Hawai'i, by Hawai'i:

- Achieves energy independence
- Expands energy choices
- Supports Hawaiian Electric's Climate Change Action Plan

Why does transitioning to clean energy matter for everyone?

Achieving a resilient, clean energy grid is a complex challenge that will require collaboration, compromise and creativity on customer, community and statewide levels.

- **As a customer**, you'll start seeing more energy choices and programs to incentivize using clean energy. You'll also have opportunities to share feedback with us about your energy priorities and needs to inform our projects and programs.
- **In your community**, you may see development of new energy facilities and grid infrastructure. Your insights are essential in helping us identify and develop projects and create a more equitable clean energy future.
- **On a statewide level**, benefits of a Hawai'i Powered future include achieving energy independence and supporting larger efforts to decarbonize the islands. It will take collective and sustained action to cut carbon emissions across sectors. This includes air and ground transportation, agriculture, shipping, manufacturing and tourism—in other words, every sector, and every type of work can contribute to decarbonizing our state.

Why is it important to have different clean energy sources?

Using a diverse mix of renewable energy sources improves the grid's resilience—it expands our energy options and helps us adapt to evolving needs, bounce back from unexpected events and provide more reliable power and predictable pricing for customers.

For example, relying on a single source of energy (like solar) is not feasible or wise, as it makes us more vulnerable to unexpected events (like earthquakes, storms and other disasters) and natural changes to the energy source (for example, when the sun isn't shining).

Integrated grid planning (IGP)

What is IGP?

Integrated Grid Planning (or "IGP") is our path to a Hawai'i Powered future. This framework brings many people together to build a resilient and reliable grid from local, clean energy sources with various technologies and scales. In this context, "resilience" means adapting to social, environmental, economic and technological changes to meet current and future energy needs.

What challenges is IGP solving?

Our IGP challenge is to create a clean energy grid that:

- Stays on track with the state's timelines
- Stabilizes costs for customers
- Reduces conflicts with other land use priorities
- Minimizes impacts to communities
- Improves our overall energy resilience

This is challenging because these pieces are sometimes in conflict—for example, some renewable resources might have a smaller footprint or fewer impacts to their surroundings, but they might also be more expensive or less reliable.

Together with stakeholder groups and community members, Hawaiian Electric is working to solve this puzzle: prioritizing, considering and connecting those many pieces. This includes the number of electric vehicles, programs for private and community-based solar projects, emerging technologies and industries and preparation for extreme events.

Engaging Stakeholders and Communities

How is Hawaiian Electric connecting with communities?

Hawaiian Electric is committed to equitable, inclusive and transparent community engagement at each step of the planning process. This means:

Providing accessible and inclusive opportunities to engage

- Offering multiple ways to engage, both virtually and in-person
- Connecting with people at events or small group talk sessions to listen and gather community insights
- Providing information in multiple languages and in formats that meet or exceed accessibility standards

Reaching out to and integrating feedback from people who are historically underserved

- Prioritizing outreach to underserved and potentially most impacted communities, including people who live in rural areas and people closest to places where new energy facilities may be located
- Listening to community members' experiences, priorities and vision and using their feedback to shape planning outcomes

Being accountable to feedback we have received

- Reviewing and considering public feedback as part of planning decisions, including where to locate new energy facilities and transmission corridors
- Clearly communicating how community input shapes outcomes throughout the planning process through feedback loops

Safety is their top priority!

Hawaiian Electric's outreach strategies will align with all local, state and federal guidelines for public health and safety.

What types of feedback does Hawaiian Electric consider?

Hawaiian Electric gathers and consider two types of feedback throughout the IGP process:

- **Community:** What are community members' vision and priorities for a clean energy future?
- **Technical:** What needs to happen from scientific, engineering and economic perspectives to meet our carbon goals?

How will Hawaiian Electric use community input this year?

Community input is essential to create projects and programs that are more equitable and responsive to local needs. A transparent, inclusive and accountable community engagement process is planned that includes

"feedback loops," showing how community input is collected and considered in Hawaiian Electric decisions and recommendations to the Public Utilities Commission (PUC).

This year, you'll see invitations to share your thoughts online and in person about:

- Locations for future energy projects
- How best to involve your community in project identification and development

We'll use input from community members and technical experts to inform our recommendations to the Public Utilities Commission about these two subjects: where to locate new energy projects (including generation facilities and grid infrastructure) and how to define better processes for involving the public in the selection and development of projects.

We appreciate the opportunity to listen to the community's concerns and collaborate with stakeholders on potential solutions, and we take all feedback seriously. However, there are cases where we are unable to directly integrate all the input we receive into our decisions and recommendations. In those cases, we will follow up by sharing our reasoning for decisions and why we have chosen to integrate certain points.

What is a recent example of Hawaiian Electric utilizing community input?

In the latest round of grid-scale renewable energy procurements, Hawaiian Electric proposed that project developers be required to develop community benefits packages for the areas hosting a project. These benefits would address critical needs that have been identified by the host community itself. Developers would have to seek input from the host communities and donate funds for actions, programs or to 501(c)(3) not-for-profit community-based organization(s) dedicated to the community identified need.

General Information and Definitions

What are Hawaiian Electric's climate change/carbon goals?

Hawaiian Electric's top priority is building a sustainable Hawai'i in which our children and grandchildren, our communities, our customers and our employees will thrive, together.

Together, we are committed to reducing carbon emissions by 70% by 2030 and reaching net zero emissions by 2045.

Reducing carbon emissions by more than two-thirds over this decade will be a stretch. We know it's achievable, and if everyone pitches in, we'll create a cost-effective, sustainable and resilient energy system for future generations.

Learn More

hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning

igp@hawaiianelectric.com

What does decarbonization mean?

Decarbonization means reducing, offsetting, or eliminating all carbon-producing sources contributing to climate change. It's a comprehensive approach to climate resilience that considers all sources of carbon emissions—including electricity generation, transportation, shipping, waste management, agriculture, manufacturing, and forest management.

What does carbon neutrality mean?

Carbon neutrality means achieving net zero carbon dioxide emissions. There are two general strategies to reach carbon neutrality:

1. Reducing or eliminating emissions - ways to reduce emissions include using renewable energy sources, increasing public transit ridership and swapping gas-powered for electric vehicles
2. Offsetting emissions in one sector by reducing them somewhere else - one way to offset emissions is reforestation to capture and store (or "sequester") carbon; plants, trees, soil and the ocean naturally sequester carbon

What sources of renewable energy does Hawaiian Electric use?

Hawaiian Electric has many options for renewable energy sources on the islands. Today, Hawaiian Electric uses a diverse mix of local, renewable sources including waste-to-energy, biomass, geothermal, hydroelectric, wind, biofuels and solar. Solar currently makes up the largest slice of our clean energy sales (at approximately 62%).

Biofuel and biomass:

Come from organic matter, including plants, algae, forestry or farming waste (like sugar cane fiber), or restaurant grease. When burned, biomass creates steam that can be used for

heat or to power a turbine to produce electricity. It can also be converted into liquid biofuel, which can replace petroleum-based diesel.

Geothermal energy:

Comes from volcanic heat stored beneath the earth's surface. Underground reservoirs of water heated by volcanic activity can be tapped for steam to generate electricity.

Hydro energy:

Flowing water—in streams, rivers and irrigation ditches—can be used to generate electricity. Hawai'i uses what are known as "run-of-the-river" hydro plants. Some water is diverted out of a running stream and piped to a building that houses a turbine-generator. After spinning the turbine, the water is returned to the stream.

Ocean energy:

There are two forms of ocean energy:

- Mechanical energy such as waves, currents and tides
- Ocean thermal energy conversion, which takes advantage of the temperature differences between sun-warmed surface water and cold deep water to generate electricity

Solar:

Energy from the sun is converted into heat or electricity through solar thermal systems or photovoltaics (also known as solar panels).

Wind:

The motion of the wind is captured and converted to electricity by wind turbine generators. Many wind turbines grouped together are called a wind farm. Hawaiian Electric is open to both on-island and offshore wind options, in consultation with host communities.

Learn More

 hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning

 igp@hawaiianelectric.com

Community Engagement

At Hawaiian Electric, we view the public as an active and essential partner in implementing our Climate Change Action Plan. We strive to break down the barriers between our work and the communities we are a part of and serve. We'll continue to build partnerships with community members by listening, learning and integrating ideas and feedback into our planning process.

How will Hawaiian Electric engage the community?

We are committed to equitable, inclusive and transparent community engagement at each step of the planning process. This means:



Providing accessible and inclusive opportunities to engage

- Offering multiple ways to engage, both online and in person
- Hosting talk stories in locations that are accessible by public transportation
- Providing information in multiple languages and in formats that meet or exceed accessibility standards



Reaching out to and integrating feedback from people who are historically underserved

- Prioritizing outreach to underserved and potentially most impacted communities, including people who live in rural areas and people closest to places where new energy facilities may be located
- Listening to community members' experiences, priorities, and vision and using their feedback to shape planning outcomes



Being accountable to feedback we have received

- Reviewing and considering public feedback as part of planning decisions, including where to locate new energy facilities and transmission corridors
- Clearly communicating how community input shapes outcomes throughout the planning process through feedback loops

Safety is our top priority!

Our outreach strategies will align with all local, state and federal guidelines for public health and safety.

What outreach tools does Hawaiian Electric use to connect with communities?

Over the next year, we will use virtual and in-person outreach tools to share information with the public and gather input. These tools include:



Online participation site

Hub for up-to-date information and community feedback, with interactive maps, comment form and survey questions.



Briefings with community organizations

Offering presentations at existing community meetings, either virtually or in person.



Community talk stories

Smaller, informal in-person or virtual conversations with community members to share information and discuss Hawai'i's energy future.




We will tailor our outreach tools and strategies to meet the unique needs of each island.

For more information visit:

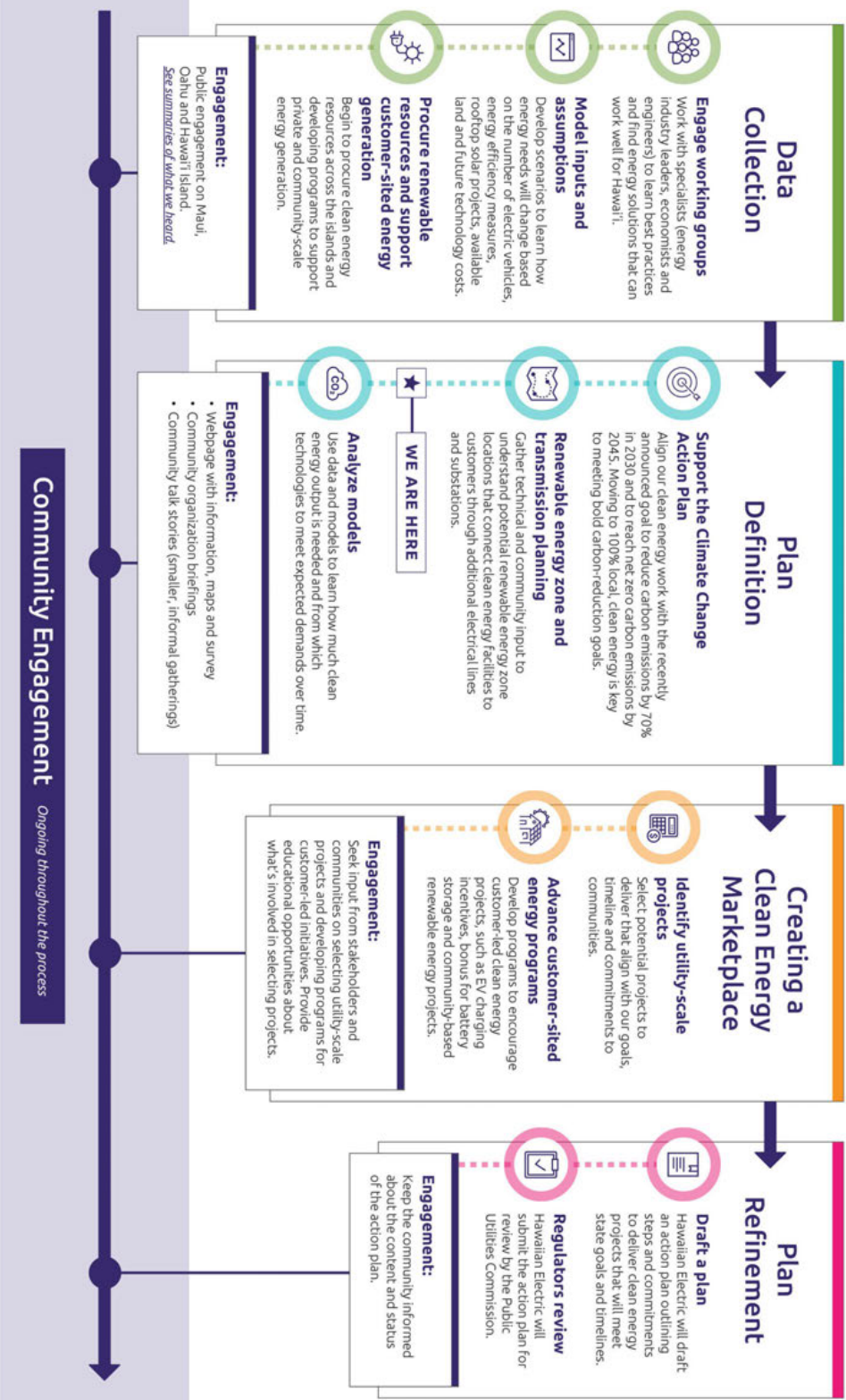
www.HawaiiPowered.com

Learn More

 hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning

 igp@hawaiianelectric.com

Project Process



Hawai'i Powered 

Clean energy for Hawai'i, by Hawai'i

Hawai'i Island

 Hawaiian Electric Adjust date in Slide Master

Hello and thank you for having *me/us* here today to share updates about Hawaiian Electric’s planning effort for a clean energy future and my role in the process as a member of Integrated Grid Planning Stakeholder Council.

Planning for a sustainable future

Together, we can:

- Reduce carbon emissions by **70%** by 2030 
- Reach **net zero emissions** by 2045 
- Be **100% Hawai'i Powered**—using all local, renewable resources—by 2045 

 Hawaiian Electric Hawai'i Powered 

Hawaiian Electric’s top priority is building a sustainable Hawai'i in which our children and grandchildren, our communities, our customers and our employees will thrive, together.

Together, we are committed to reducing carbon emissions by 70% by 2030 and reaching net zero emissions by 2045.

Reducing carbon emissions by more than two-thirds over this decade will be a stretch. We know it’s achievable, and if everyone pitches in, we’ll create a cost-effective, sustainable and resilient energy system for future generations.

Climate Change Action Plan

Decarbonize | *verb*

To reduce, offset or eliminate all carbon-producing sources contributing to climate change.

Decarbonization is a comprehensive approach to climate resilience that considers all sources of carbon emissions.



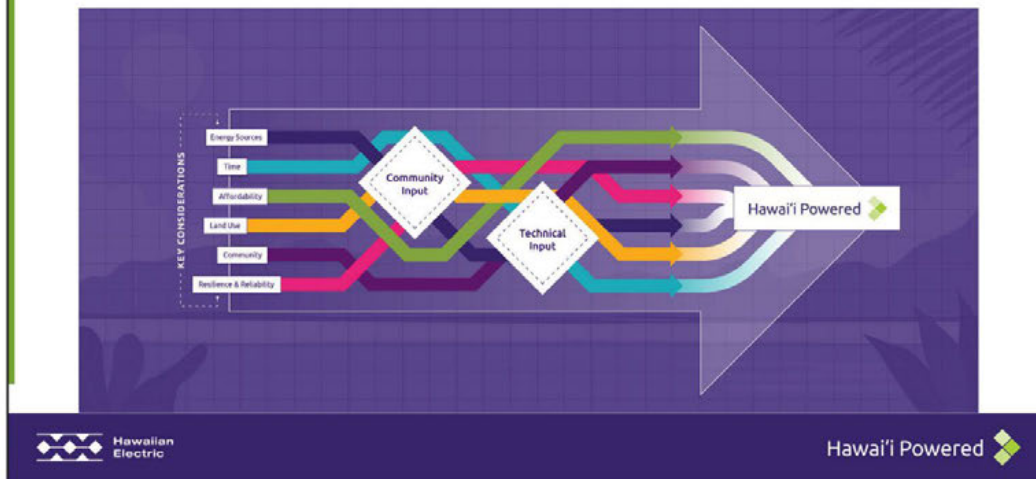
Why does this matter for everyone?

Achieving a more sustainable future is a complex challenge that takes **collaboration, compromise and creativity** on customer, community and statewide levels.



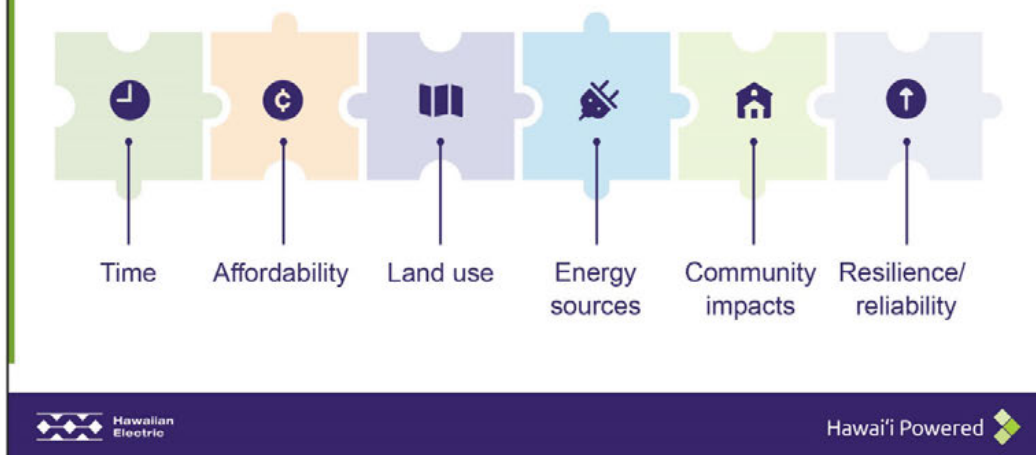
Achieving a resilient, clean energy grid is a complex challenge that will require **collaboration, compromise and creativity** on customer, community and statewide levels.

Path to Hawai'i Powered



Integrated Grid Planning (or "IGP") is our path to a Hawai'i Powered future.

Planning challenges



Integrated grid planning is like solving a giant puzzle with new pieces added along the way.

Our IGP challenge is to create a clean energy grid that:

- Stays on track with the state's timelines
- Stabilizes costs for customers
- Reduces conflicts with other land use priorities
- Minimizes impacts to communities
- Improves our overall energy resilience

Thanks for your participation to date!



Hawaiian Electric is grateful for your involvement since our planning began in 2019. They appreciate the opportunity to listen and collaborate with community members on potential solutions, and they value all the feedback received.

Partnering with the Stakeholder Council, Working Groups, Technical Advisory Panel and the broad public is essential to align their planning with statewide priorities and move Hawaii one step closer to a more equitable clean energy future.

Island update:

Hawaii

- Hawaiian Electric currently has four Requests for Proposals (RFPs) to identify new opportunities for renewable energy projects on Hawaii Island.
- Since March, we've been reaching out to communities around the island to provide updates on current and upcoming renewable energy projects on Hawaii Island.
- Our team, along with Hawaii Energy, also participates in the County of Hawaii's island wide Community Informational Sessions to share information about renewable energy, electric bills, energy efficiency, and energy conservation.



Hawaiian Electric currently has four Requests for Proposals (RFPs) to identify new opportunities for renewable energy projects on Hawaii Island. RFPs are part of a competitive bidding process where we seek proposals from developers to deliver specific energy projects. RFPs are related to "Expressions of Interest," which is an earlier step where we ask the developer community for feedback to learn more about different technologies and opportunities for potential projects. [Learn more about the competitive bidding process and see open RFPs on Hawaii.](#)

Island update:

Maui

- Hawaiian Electric recently released a draft Request for Proposals (RFP) to identify new opportunities for renewable energy projects on Maui.
- Like many utilities around the world, the team is working to address evolving supply chain issues affecting generation and renewable energy projects.
- We understand that these delays affect customer bills and we're working to stabilize costs.
- This is an "all-hands on deck" effort that involves partnering with government agencies, community-based organizations and other energy providers to identify generation solutions, help customers manage costs and promote energy efficiency.



Hawaiian Electric [recently released a draft Request for Proposals \(RFP\)](#) to identify new opportunities for renewable energy projects on Maui. RFPs are part of a competitive bidding process where we seek proposals from developers to deliver specific energy projects. RFPs are related to "Expressions of Interest," which is an earlier step where we ask the developer community for feedback to learn more about different technologies and opportunities for potential projects. Learn more about the competitive bidding process and [see open RFPs on Maui](#).

Island update:

Oahu

- Like many utilities around the world, the Hawaiian Electric team is adapting to evolving supply chain issues affecting generation and renewable energy projects.
- We understand that these delays affect customer bills and we're working to stabilize costs by entering power purchase agreements, or PPAs, with renewable energy providers.
- The more renewable energy that comes online, the less we're dependent on imported oil and tied to the price fluctuations associated with fossil fuels. Resilience and reliability are critical as the lights need to stay on.
- Oahu customers will soon be able to participate in shared solar programs administered by Hawaiian Electric. We hope you'll join us in generating renewable energy! Learn more about shared solar, the latest phase of community-based renewable energy.



Like many utilities around the world, the Hawaiian Electric team is adapting to evolving supply chain issues affecting generation and renewable energy projects. We understand that these delays affect customer bills and we're working to stabilize costs by entering power purchase agreements, or PPAs, with renewable energy providers. The more renewable energy that comes online, the less we're dependent on imported oil and tied to the price fluctuations associated with fossil fuels. Resilience and reliability are critical as the lights need to stay on.

Island update:

Lanai

- The Hawaiian Electric team recently announced its selection of a developer to build and maintain the largest renewable energy project and the first to offer the shared solar program on the island.
- Much of our grid planning work on Lanai is happening in collaboration with the majority landowner on the island.
- We look forward to adding more renewables on Lanai to move forward with the transition to clean energy.
- In the coming months, Hawaiian Electric will start installing advanced meters for Lanai customers. Advanced meters are an important component of our grid modernization efforts.



Island update:

Molokai

- Currently, the island is preparing a Molokai Community Energy Resilience Action Plan (CERAP): an independent, island-wide, community-led and expert-informed collaborative planning process to increase renewable energy on Molokai.
- The CERAP is being coordinated by the Molokai Clean Energy Hui by Sustainable Molokai. The Hawaiian Electric team is excited to provide technical support to the Molokai Clean Energy Hui in their planning process to develop a portfolio of clean energy projects to achieve 100% renewable energy for the island that is feasible, respectful of Molokai's culture and environment and strongly supported by the community.




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How will we use your input this year?

This year, we'll be inviting you to share your thoughts about:

- Potential locations for future energy projects
- How best to engage you early during project identification and development in your community.



Integrated Grid Planning
What changes do you think are best to help Hawaii get to 100% renewables?

Hawaiian Electric | Hawai'i Powered

Engagement Tools

Online participation site
Online hub for up-to-date information and community feedback, with interactive maps, comment form and survey questions.
www.hawaiipowered.com

Briefings with community organizations
Offering presentations at existing community meetings, either virtually or in person.
In Progress

Community talk stories
Smaller, informal in-person or virtual conversations with community members to share information and discuss Hawaii's energy future.
Fall 2022

We will tailor our outreach tools and strategies to meet the unique needs of each island.

Safety is our top priority!
Our outreach strategies will align with all local, state and federal guidelines for public health and safety.

Hawaiian Electric | Hawai'i Powered

A variety of in-person and virtual tools and strategies will be used to share information with the public and gather input. These tools include:

- **Online participation site:** Hub for up-to-date information and community feedback, with interactive maps, comment form, and survey questions. This launched in March 2022
- **Continued briefings with community organizations:** Offering presentations at existing community meetings, either virtually or in person. These are ongoing
- **Community talk stories:** Smaller, informal in-person or virtual conversations with community members to share information and discuss Hawaii's energy future. These are scheduled to begin in early fall 2022

Connect today!

Hawai'i Powered launched March 10

Features include:

- Intro Video
- Blog: **Plugged In**
- Vision and Goals
- FAQs
- Process and Timeline
- Community Engagement



We invite you to stay involved



Visit our online participation site and sign up for **monthly email updates**:
hawaiipowered.com



Read **Plugged In** – our Hawai'i Powered Blog – for the latest insights and happenings: **hawaiipowered.com**



Contact us or request a presentation:
IGP@hawaiianelectric.com



We encourage you to stay tuned for opportunities to learn more and share your thoughts by visiting our online participation site, signing up for our email list and reading our blog.

We welcome feedback and questions—email us anytime at IGP@hawaiianelectric.com. You can also request a briefing for your community organizations.

1.2 Technical Advisory Panel

The Technical Advisory Panel, also referred to as the TAP, has been working together from September 2018 to December 2022, discussing various technical topics supporting the development of the Integrated Grid Plan. The following table includes a list of dates with links to meeting summaries and technical reports. This information along with additional presentations are available within the [Key Stakeholder Documents Library](#).

Date	Notes
September 15, 2018	Meeting Summary
May 7, 2019	Meeting Summary
September 10, 2019	Meeting Summary
October 22, 2019	Meeting Summary
November 19, 2019	Meeting Summary
December 17, 2020	Meeting Summary
February 24, 2021	Meeting Summary
June 1, 2021	TAP Response to Order No. 37730
July 28, 2021	Workplan Update
October 1, 2021	TAP Feedback – Renewable Energy Zone Study
October 4, 2021	TAP Feedback – Transmission Planning Criteria TAP Feedback – System Security Methodology
October 11, 2021	TAP Feedback – Non-Wires Opportunity Evaluation Methodology TAP Feedback – Distribution Planning Methodology
November 1, 2021	TAP Feedback – Proposed Energy Reserve Margin (ERM) Criteria
December 13, 2021	TAP Feedback – System Stability Study
January 20, 2022	TAP Feedback – Additional Evaluation of Hourly Dependable Capacity (HDC) Values
January 21, 2022	TAP Feedback – System Stability Study
February 25, 2022	TAP Feedback – Under Frequency Load Shed (UFLS) Study UFLS Study Discussion
March 10, 2022	TAP Feedback – Order 38253
March 11, 2022	TAP Feedback – Distribution Planning Methodology (Clarifications) Load Forecast Scenario Discussion
April 28, 2022	TAP Feedback
June 2, 2022	TAP Feedback
July 7, 2022	TAP Feedback TAP Feedback Summary
July 12, 2022	TAP Feedback
August 4, 2022	TAP Progress Update
August 11, 2022	TAP Feedback
September 14, 2022	TAP Progress Update
November 15, 2022	TAP Feedback
November 16, 2022	TAP Feedback
December 1, 2022	TAP Feedback

1.3 Stakeholder Technical Working Group

The Stakeholder Technical Working Group, also referred to as STWG, met between June 2021 and February 2023, discussing various technical topics supporting the development of the Integrated Grid Plan. The following table includes a list of meeting dates and links to meeting notes. This information along with supporting documents are available within the [Key Stakeholder Documents Library](#).

Date	Notes
June 2, 2021	Meeting Summary
June 17, 2021	Meeting Summary
July 14, 2021	Meeting Summary
July 16, 2021	Meeting Summary
August 4, 2021	Meeting Recording
September 7, 2021	Meeting Summary
September 23, 2021	Meeting Summary
October 6, 2021	Meeting Summary
October 13, 2021	Meeting Summary
November 19, 2021	Meeting Summary
September 14, 2022	Meeting Summary
November 29, 2022	Presentation
December 15, 2022	Presentation
January 19, 2023	Presentation
February 16, 2023	Presentation

1.4 Public Engagement (2020)

A collection of public engagement notifications, materials and summary documents associated with Hawaiian Electric engagement opportunities.

- Meeting Invites: postcard and fliers
- Media advertisements and social media
- Meeting materials
- Survey questions and input forms
- Virtual open house and statistics
- Graphic summary

Island	Link
Hawai'i	Meeting Recording
O'ahu	Meeting Recording
Maui	Meeting Recording

1.4.1 Public Engagement Materials

The following pages show images of display boards, advertisements, social media posts, comment cards, maps and diagrams, and screenshots from a virtual open house.

Getting to 100% Renewables

Join Us At Our Public Meetings

See back for details.

5:00 pm–7:30 pm

>>> Learn how we use **Integrated Grid Planning (IGP)** to plan for our renewable future together.

CAN'T JOIN US?

Visit our Online Open House available March 2–20, 2020
www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning

Public Meeting Agenda

PART 1

Open House

5:00 pm–6:00 pm

PART 2

Panel Discussion

6:00 pm–7:30 pm

Dates & Locations

TUESDAY **Mar 03** **Kealakehe High School (Cafeteria)**
74-5000 Puohulihuli Street
Kailua-Kona, HI 96740

TUESDAY **Mar 10** **Hawaii Pacific University**
(Multi-Purpose Room 2)
1 Aloha Tower Drive
Honolulu, HI 96813

THURSDAY **Mar 05** **Hilo High School (Cafeteria)**
556 Waiuanuenue Avenue
Hilo, HI 96720

THURSDAY **Mar 12** **Maui Electric (Auditorium)**
210 W Kamehameha Avenue
Kahului, Maui 96732



• Pupus will be provided • Free parking with validation

Email: IGP@hawaiianelectric.com

Website: www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning



facebook.com/HawaiianElectric



twitter.com/hwnelectric



instagram.com/hawaiianelectric

Getting to 100% Renewables

Join Us At Our
Public Meetings
5–7:30 pm



Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

Agenda

PART 1

Open House
5–6 pm

PART 2

Panel Discussion
6–7:30 pm

Dates & Locations

TUESDAY
Mar 03

Kealakehe High School (Cafeteria)
74-5000 Puohulihuli Street
Kailua-Kona, Hawai'i 96740

TUESDAY
Mar 10

Hawaii Pacific University*
(Multi-Purpose Room 3)
1 Aloha Tower Drive
Honolulu, O'ahu 96813
**Free parking with validation*

THURSDAY
Mar 05

Hilo High School (Cafeteria)
556 Waiānuenue Avenue
Hilo, Hawai'i 96720

THURSDAY
Mar 12

Hawaiian Electric (Kahului Auditorium)
210 W. Kamehameha Avenue
Kahului, Maui 96732



• Pupus will be provided • Check out our careers station

VIRTUAL OPEN HOUSE

Can't join us? Then visit our Virtual Open House between **March 2–20, 2020** at www.hawaiianelectric.com/igp

**WE WANT
TO HEAR
FROM YOU**

We welcome your input!
Here are the many ways
to stay connected with us.

Email:

IGP@hawaiianelectric.com



Website:

www.hawaiianelectric.com/igp



**Hawaiian
Electric**

Hawai'i's Renewable Energy Future Series Getting to 100% Renewables

Join Us At Our
Community Meeting
5–7:30 pm

Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

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74-5000 Puohulihuli Street
Kailua-Kona, Hawai'i 96740

THURSDAY **Mar 05** **Hilo High School (Cafeteria)**
556 Waiānuenue Avenue
Hilo, Hawai'i 96720

Pupus will be provided at both community meetings

PART 1 Open House Stations 5–6 pm

Eight (8) informational stations to browse and ask questions:

1. Integrated Grid Planning (IGP)
2. Grid Modernization
3. Grid Scale Renewables
4. Rooftop Renewable Energy
5. Community-Based Renewable Energy
6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART 2 Panel Discussion 6–7:30 pm

Panel Participants

- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning and Technology
- Hawaiian Electric | Kevin Waltjen, Director, Hawai'i Island
- Hawaiian Electric | Lisa Dangelmaier, Director, System Operations, Hawai'i and Maui
- County of Hawai'i | Riley Saito, Deputy Director, Research and Development
- Geometrician Associates | Ron Terry, Principal
- Community | Carol Ignacio

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Hawaiian Electric

Getting to 100% Renewables

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Public Meetings
5 – 7:30 pm

>>> Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

TUESDAY
Mar
10

Hawaii Pacific University* (Multi-Purpose Room 3)
1 Aloha Tower Drive, Honolulu, O'ahu 96813
**Free parking with validation*
Pupus will be provided

PART 1 Open House Stations 5 – 6 pm

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6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART 2 Panel Discussion 6 – 7:30 pm

Panel Participants

- Community | Cynthia Rezentes, Nanakuli Neighborhood Board Chair
- Ulupono Initiative | Murray Clay, President
- O'ahu Economic Development Board | Pono Shim, President & CEO
- City & County of Honolulu | Josh Stanbro, Chief Resilience Officer & Executive Director, Office of Climate Change, Sustainability & Resiliency
- Hawai'i Farm Bureau | Brian Miyamoto, Executive Director
- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning and Technology

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IGP@hawaiianelectric.com



Website:
www.hawaiianelectric.com/igp



Maui's Renewable Energy Future Series Getting to 100% Renewables

Join Us At Our
Community Meeting
5–7:30 pm

>>> Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.

THURSDAY
Mar
12

Hawaiian Electric (*Kahului Auditorium*)
210 W. Kamehameha Avenue
Light refreshments will be provided

PART 1 Open House Stations 5–6 pm

Eight (8) informational stations to browse and ask questions:

1. Integrated Grid Planning (IGP)
2. Grid Modernization
3. Grid Scale Renewables
4. Rooftop Renewable Energy
5. Community-Based Renewable Energy
6. Resilience
7. Electrification of Transportation
8. Careers at Hawaiian Electric

PART 2 Panel Discussion 6–7:30 pm

Panel Participants

- **Rhiannon Chandler-'Iao**, Executive Director, Waiwai Ola Waterkeepers Hawaiian Islands
- **Colton Ching**, Senior Vice President, Planning and Technology, Hawaiian Electric
- **Rebecca Dayhuff Matsushima**, Director, Renewable Acquisitions, Hawaiian Electric
- **Dick Mayer**, Coordinator, Alliance for Maui Community Associations
- **Michele McLean**, Director, Department of Planning, County of Maui

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Hawaiian
Electric

Hawai'i's Renewable Energy Future Series Getting to 100% Renewables

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5 – 7:30 pm



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THURSDAY **Mar 05** **Hilo High School (Cafeteria)**
556 Waiānuenue Avenue
Hilo, Hawai'i 96720

Pupus will be provided at both community meetings

PART 1

Open House Stations | 5 – 6 pm

• 8 Informational Stations to browse and ask questions

PART 2

Panel Discussion | 6 – 7:30 pm

- Hawaiian Electric | Colton Ching, Sr. V.P., Planning & Technology
- Hawaiian Electric | Kevin Waltjen, Director, Hawai'i Island
- Hawaiian Electric | Lisa Dangelmaier, Director, System Operations, Hawai'i and Maui
- County of Hawai'i | Riley Saito, Deputy Director, Research & Development
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Hawaiian Electric

Hawai'i's Renewable Energy Future Series Getting to 100% Renewables

Join Us At Our Community Meeting
5 – 7:30 pm

Be part of the **Integrated Grid Planning (IGP)** conversation to shape our renewable energy future together.



TUESDAY
Mar 10

Hawaii Pacific University
(Multi-Purpose Room 3)
1 Aloha Tower Drive
Honolulu 96813

- Free parking with validation
- Pupus will be provided

PART 1 Open House Stations | 5 – 6 pm

- 8 Informational Stations to browse and ask questions

PART 2 Panel Discussion | 6 – 7:30 pm

- **Community** | Cynthia Rezentes, Nanakuli Neighborhood Board Chair
- **Ulupono Initiative** | Murray Clay, President
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- **Hawai'i Farm Bureau** | Brian Miyamoto, Executive Director
- **Hawaiian Electric** | Colton Ching, Sr. Vice President, Planning and Technology

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Hawaiian Electric

Kona Social Media Posts



Event Post (February 19 to March 3, 2020)



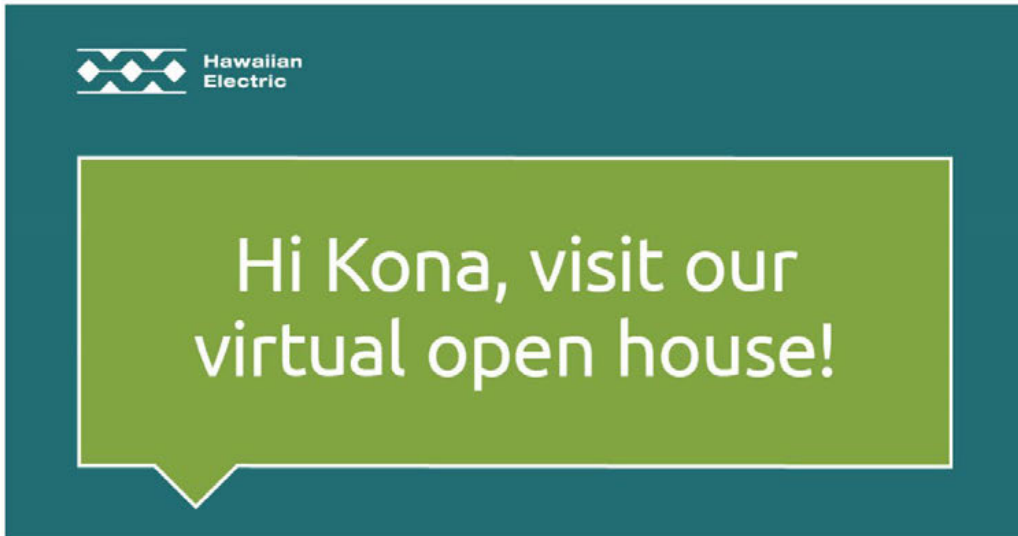
Facebook Day of Post (March 3, 2020)



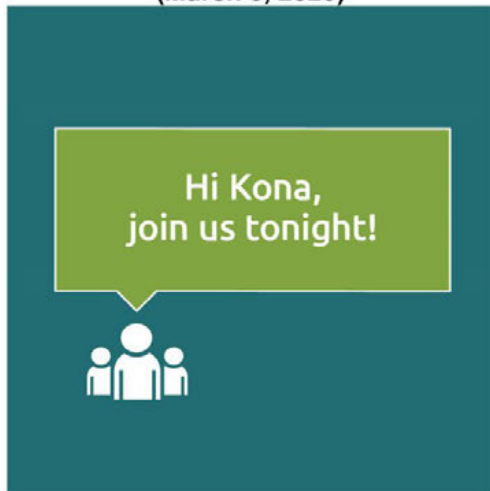
Kona Social Media Posts



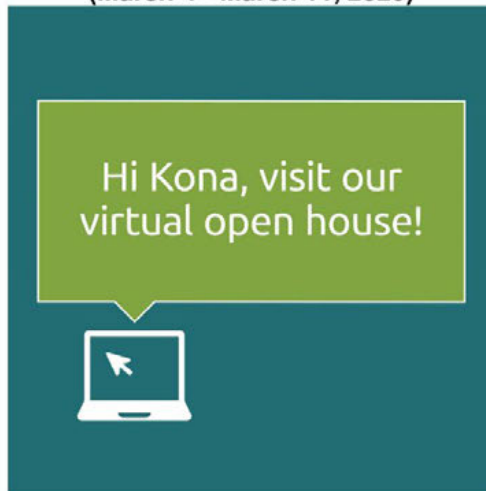
Facebook After Event Post (March 4 to March 11, 2020)



Twitter Day of Post (March 3, 2020)




Twitter After Event Post (March 4 - March 11, 2020)



Hilo Social Media Posts




Event Post (February 21 to March 5, 2020)

 **Hawaiian Electric**

Integrated Grid Planning

Listening + Integrating + Collaborating to Reach 100% Renewables by 2045

Join us, Hilo!
Come be part of the
100% Renewables
Conversation



Facebook Day of Post (March 5, 2020)

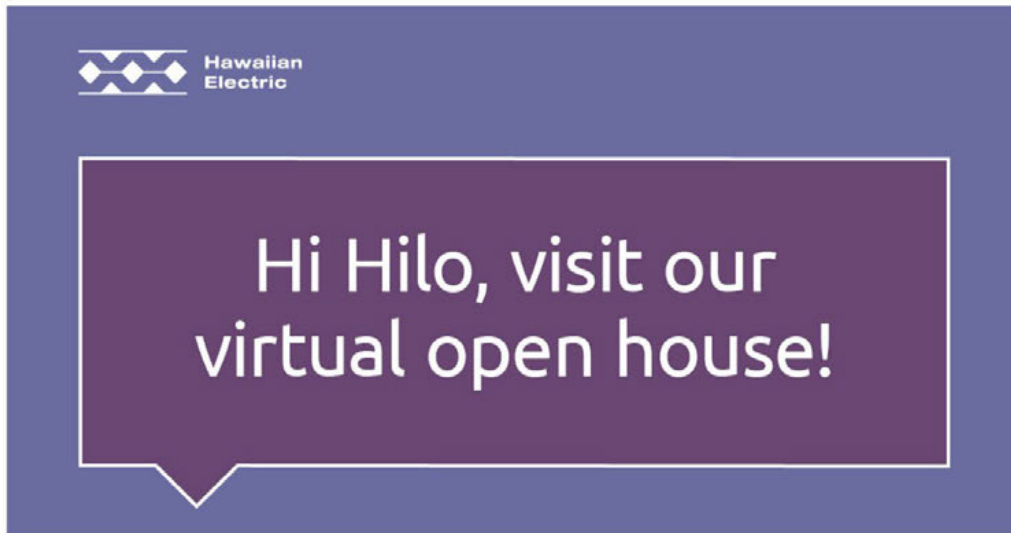
 **Hawaiian Electric**

**Hi Hilo,
join us tonight!**

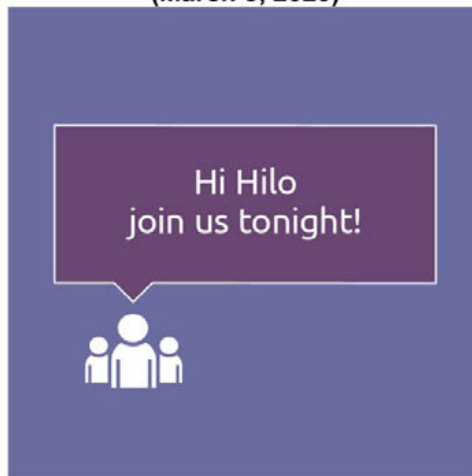
Hilo Social Media Posts



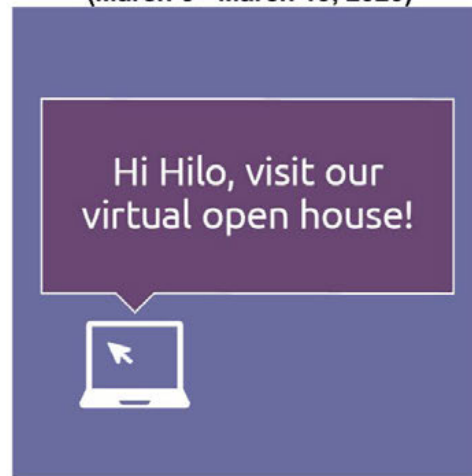
Facebook After Event Post (March 6 to March 19, 2020)



Twitter Day of Post (March 5, 2020)



Twitter After Event Post (March 6 - March 19, 2020)



Honolulu Social Media Posts



Event Post (February 25 to March 10, 2020)

This is a Facebook event post for Hawaiian Electric. The top section features the Hawaiian Electric logo and the title "Integrated Grid Planning" with the subtitle "Listening + Integrating + Collaborating to Reach 100% Renewables by 2045". Below this, three circular icons represent solar panels on a house, a battery with a lightning bolt, and an electric car. The main text of the post reads "Join us, O`ahu! Come be part of the 100% Renewables Conversation".

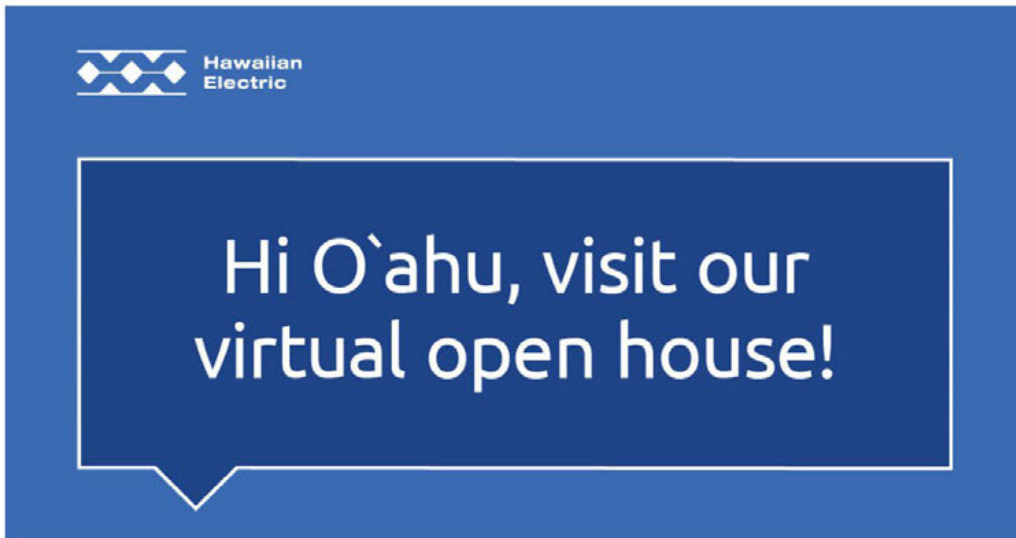
Facebook Day of Post (March 10, 2020)

This is a Facebook Day of Post for Hawaiian Electric. It features the Hawaiian Electric logo in the top left corner. The main content is a large white speech bubble on a blue background containing the text "Hi O`ahu, join us tonight!".

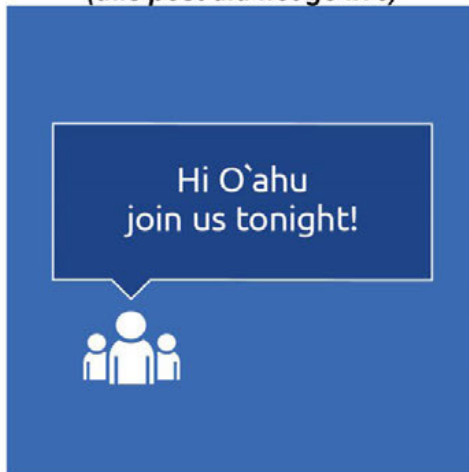
Honolulu Social Media Posts



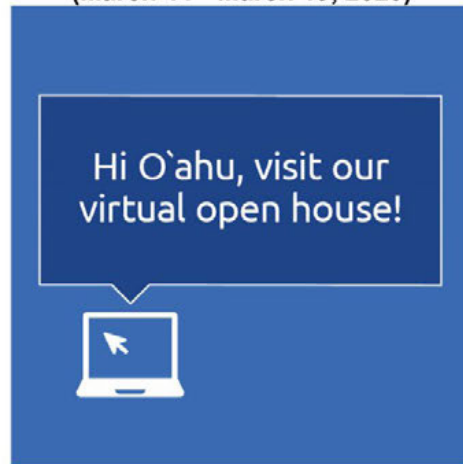
Facebook After Event Post (March 11 to March 19, 2020)



Twitter Day of Post (this post did not go live)



Twitter After Event Post (March 11 - March 19, 2020)



Maui Social Media Posts



Event Post (February 26 to March 10, 2020)

Integrated Grid Planning
Listening + Integrating + Collaborating to Reach 100% Renewables by 2045

Join us, Maui!
Come be part of the
100% Renewables
Conversation

The graphic features three circular icons: a house with solar panels, a battery with a lightning bolt, and an electric car being charged. The background is a teal gradient.

Facebook Day of Post (*this post did not go live*)

**Hi Maui,
join us tonight!**

The graphic features the Hawaiian Electric logo in the top left corner. The main text is centered within a white speech bubble shape on a teal background.

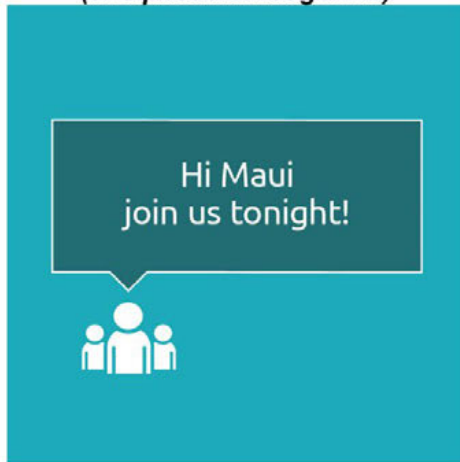
Maui Social Media Posts



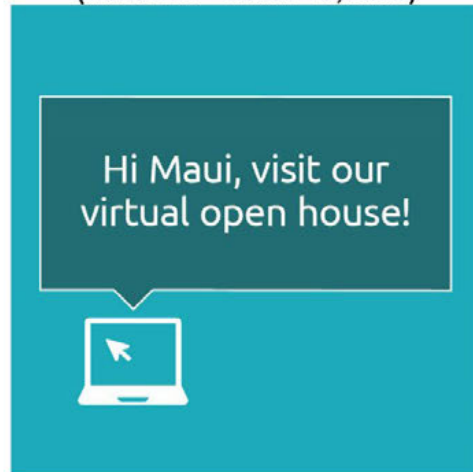
Facebook After Event Post (March 13 to March 19, 2020)



Twitter Day of Post (this post did not go live)



Twitter After Event Post (March 12 - March 19, 2020)





What is IGP?

An energy planning process to identify the best options for customers to move Hawai'i toward a clean energy future.

Our Energy Future



Achieve Energy Independence

Reduce oil dependency and volatile fuel costs by increasing renewables



Address Climate Change

Add more customer-sited and grid-scale renewables to reduce greenhouse gas emissions



Modernize Our Island Grids

Integrate new technologies to facilitate 100% renewable energy

Our Goal for the Future:

100% Renewables by 2045



TODAY



BY 2030



BY 2040



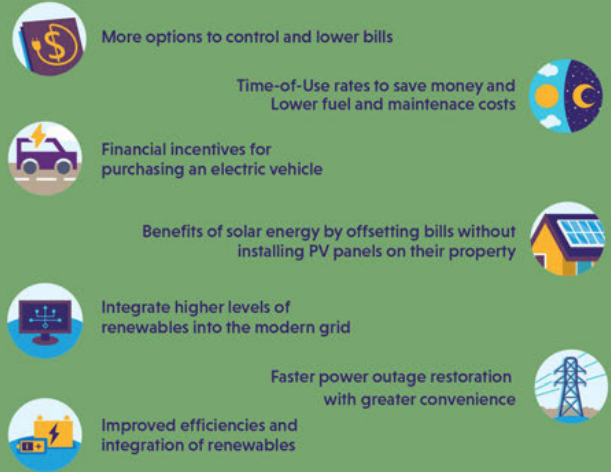
BY 2045

What We Need to Consider?

Integrated Grid Planning looks into the best technology options for all aspects of our energy system and identifies energy needs and behaviors of future customers.



How Does This Benefit Our Customers?



Who is Part of the Process?

As part of the IGP process, we are collecting your input and considering all our options in planning for our renewable future. Here are the groups Hawaiian Electric is collaborating with:

Working Groups

Address specific topics in an advisory capacity and not as a decision-making group

Stakeholder Council

Represents customers and broad stakeholders to review work and provide guidance and insights

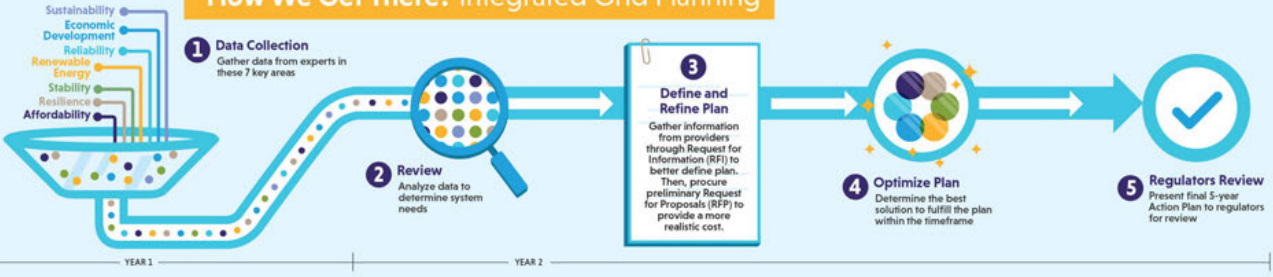
The Public

Communication with customers

Technical Advisory Panel

Provides independent evaluation and feedback on the working group activities and review point filings

How We Get There? Integrated Grid Planning



Customer Priorities

We're Listening

In response to engagement, surveys, and focus groups, we were told affordability, reliability, and energy choices are most important to customers.

Affordability

Short description that goes above Affordability.



Reliability

Short description that goes below Reliability.



Energy Choices

Short description that goes below Energy Choices.

Is this true for you?

Let us know if you have different opinions. We're using this information to help make smart future energy decisions for customers.

WE WANT TO HEAR FROM YOU

We welcome your input!
Here are the many ways to stay connected with us.

5 Ways Customers Can Help Hawai'i Reach 100% Renewables



Visit hawaiianelectric.com/products-and-services/ to learn more ways you can help

Email: IGP@hawaiianelectric.com

Website: www.hawaiianelectric.com/igp



Integrated Grid Planning Survey Questions and Input Form

Your input will help us improve future customer communications

How did you hear about this meeting?

- Social media Newspaper Radio Flyer/banner IGP Website Word of Mouth
 Other _____

In the future, what type of Integrated Grid Planning information would you be most interested in receiving?
(Select up to 3)

- General updates Utility scale renewable projects Incentive programs Rooftop and community solar renewables
 Input opportunities Electrification of transportation Advanced meters Grid modernization
 Resilience Employment opportunities
 Other _____

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

- Social media Newspaper Radio Email IGP Website Mail
 Other _____

Share any additional thoughts. We are listening!

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Want a response to your comment?

Name _____
Email _____
Phone _____

Please fold, fasten, and mail - No envelope necessary

PLACE
POSTAGE
HERE

Hawaiian Electric
Integrated Grid Planning Team
PO Box 2750
Honolulu, HI 96840

Integrated Grid Planning

Working Groups

Standardized Contracts (SCWG)

Procurement of services through a contracting mechanism between Hawaiian Electric (utility) market operators and third party providers of grid and other ancillary services.

Competitive Procurement (CPWG)

Procurement of resources in alignment with Hawaiian Electric's grid plans as identified through the IGP process.

Forecasts and Assumptions (FAWG)

Support development of forecast assumptions and sensitivities as part or pre-IGP planning cycle activity, and provide strategic inputs and feedback on assumptions and methodologies used for load forecast development and results.

Distribution Planning (DPWG)

Enhancement to the methods and tools for distribution planning and the integration with resource and transmission planning.

Grid Services (GSWG)

Identify and define additional energy, capacity, ancillary and T&D non-wires alternative services.

Resilience (RWG)

Support the development of resilience planning.

Solution Evaluation and Optimization (SEOWG)

Identify needed grid services and review and make recommendations regarding the transparent evaluation and optimization method.

	CPWG	DPWG	FAWG	RWG	SEOWG
Blue Planet Foundation					
City and County of Honolulu					
County of Maui					
Department of Business, Economic Development and Tourism, State Energy Office					
Department of Commerce and Consumer Affairs, Division of Consumer Advocacy					
Department of Defense					
Hawai'i Island Economic Development Board					
Hawai'i Energy					
Life of the Land					
O'ahu Economic Development Board					
Public Utilities Commission					
Hawai'i Energy Connection					
Ulupono Initiative					
Organizations (82 total):	23	40	17	29	13
Individuals (171 total):	40	73	24	65	29

Integrated Grid Planning

Working Group Participants

#	174 Power Global Inc.	I	ICF
A	Advanced Microgrid Solutions Applied Energy Group Arizona Public Service Electric Company Australian Energy Market Operator	L	Independent Power Producer Large Commercial and Industrial Customer Life of the Land Local Government - Hawai'i
B	Black & Veatch Blue Planet Foundation	M	Maui County Community National Renewable Energy Laboratory Nevada Energy Newport Consulting Group - Facilitator
C	Chamber of Commerce City and County of Honolulu Community Delegate - Maui Community Delegate - Moloka'i Community Delegate - Lana'i County of Hawai'i County of Maui	O	O'ahu Economic Development Board Office of State Planning Open Access Technology International
D	Demand Response Department of Business, Economic Development and Tourism, State Energy Office Department of Commerce and Consumer Affairs, Division of Consumer Advocacy Department of Defense Department of Transportation	P	Par Hawai'i Portland General Progression HI Offshore Wind Public Utilities Commission Puget Sound Energy
E	E3 Electric Power Research Institute Electric Reliability Council of Texas Enel X Energy Efficiency Energy Freedom Coalition of America Energy Island EnerNex Enphase Energy	Q	Quanta Technology
H	Half Moon Power Hawai'i Energy Hawaii Energy Strategists Hawai'i Island Economic Development Board Hawai'i Natural Energy Institute Hawai'i Pacific Solar Hawaii PV Coalition Hawai'i Society of Healthcare Engineers Hawai'i Solar Energy Association Hawaiian Electric - Lead of CPWG Hawaiian Electric - Lead of DPWG Hawaiian Electric - Lead of FAWG (load forecasting) Hawaiian Electric - Lead of FAWG (non-load forecasting assumptions) Hawaiian Electric - Lead of RWG Hawaiian Electric - Lead of SEOWG Hawaiian Telcom Holu Hou Energy LLC Honolulu Board of Water Supply	R	Renewable Energy Action Coalition of Hawai'i Rocky Mountain Institute (Public Utilities Commission consultant)
		S	S&C Electric Company Sacramento Municipal Utility District Shifted Energy Siemens Small Solar and Storage Small Solar and Storage, Hawai'i Energy Connection SolarEdge Southern California Edison Steckley Power Systems Strategies 360 - Facilitator Student at Duke University studying Energy Policy SunRun Sustainability Advocate - National Switched Source
		U	Ulupono Initiative United States Coast Guard United States Department of Commerce, National Oceanic and Atmospheric Administration United States Department of Energy, Office of Electricity United States Department of Homeland Security, Federal Emergency Management Agency University of Hawai'i Economic Research Organization
		V	Verizon Wireless
		W	Where Talk Works - Facilitator WZ Engineering
		X	X-elio

Integrated Grid Planning

An energy planning process to identify the best options for customers to move Hawai'i toward a clean energy future.

Planning Hawai'i's Grid for Future Generations

With a renewed focus on comprehensive energy planning, Hawaiian Electric proposed an Integrated Grid Planning ("IGP") process that we believe will benefit customers by identifying the best options to affordably move Hawai'i toward a reliable, resilient clean energy future with minimal risk. In addition, we believe the State will benefit from expanded market opportunities for resource, grid services, and non-wires alternatives for transmission and distribution ("T&D"), which can foster innovative solutions for a new energy economy.



Our Goal for the Future:

100% Renewables by 2045

The Renewable Portfolio Standard (RPS) percentage estimates the percent of sales that is represented by renewable energy. This is how we are measured in achieving compliance.



END 2020



BY 2030



BY 2040



BY 2045

What is our Progress?

This is where we are at in comparison to our goal above.



How Do We Get There?



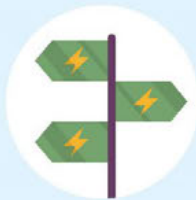
Grid Modernization

Grid modernization is transforming our energy grid to be a dynamic, two way stream of power, shifting back and forth between customers and Hawaiian Electric

What's in it for the Customer? >>>>



More information for customers to manage electric bills



More customer choices



Faster outage restoration



Minimal bill impact



Greater integration of renewable energy



More efficient power production and delivery

Protecting Your Privacy

- **We PROTECT** information and assets from all unauthorized access
- **We MONITOR** networks 24/7 at our Security Operations Center



Grid Modernization | Advanced Meters

Advanced meters are an important part of our Grid Modernization Strategy. Along with the other Grid Modernization technologies, advanced meters enable customers to:

- View your daily energy usage from your phone or computer
- Help to improve restoration times during power outages
- Manage your energy use to reduce your bill
- Help Hawai'i reach a 100% clean energy future

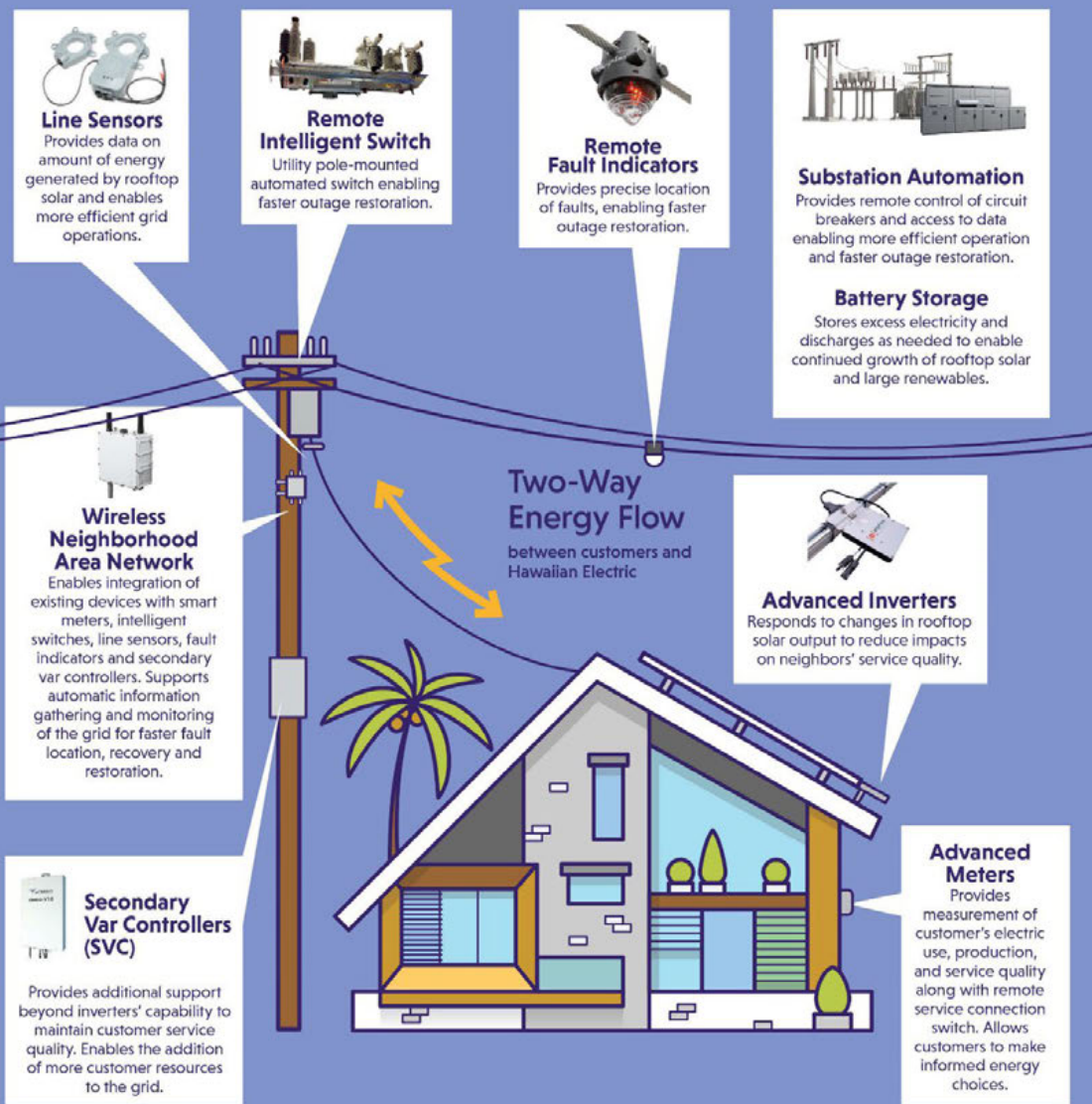
For more information visit www.hawaiianelectric.com/advancedmeters

Grid Modernization

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How does Grid Modernization Technology Work?

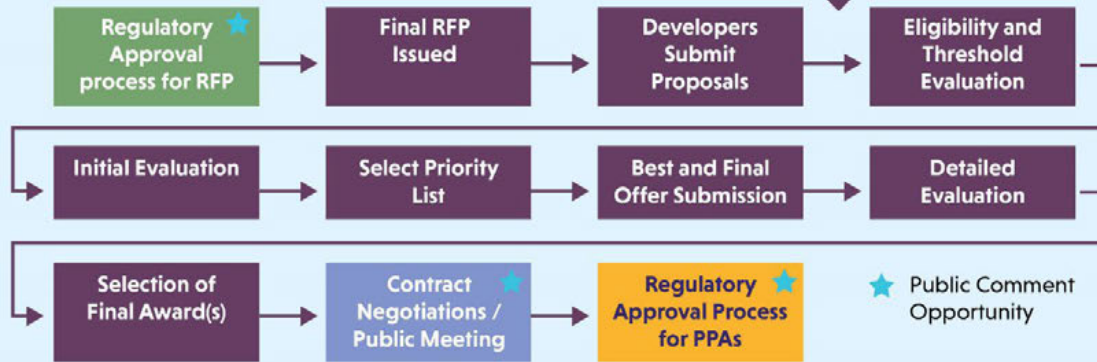
Customers' resources are an important part of the grid. Reliability is critical as more and more customers provide resources to the grid. Learn about the new technology as we move toward changing yesterday's grid to tomorrow's grid.



www.hawaiianelectric.com/gridmod

Grid-scale Renewables

Process for selecting, evaluating, and contracting new renewable projects.



Opportunities for Public Engagement

- RFP Development**
 - PUC Status Conference
 - Written comments to PUC
- Prior to signing agreement**
 - Required public meeting by selected developer
 - Ability to submit written comments which will also be provided to PUC
- PUC Approval Process**
 - Written comments to PUC
- Post PUC Approval Process**
 - Permitting approval processes requiring public comments

	O'AHU 	HAWAI'I ISLAND 	MAUI 
Stage 2 Renewable RFP	1,300,000 MWh + 200 MW Storage 50 MW Contingency Storage	70,000–444,000 MWh + 18 MW Contingency Storage	295,000 MWh + 40 MW Storage
Acres	3,000 (equivalent to 29 Aloha Stadiums)	160–1,000 (equivalent to 2–10 Aloha Stadiums)	700 (equivalent to 7 Aloha Stadiums)

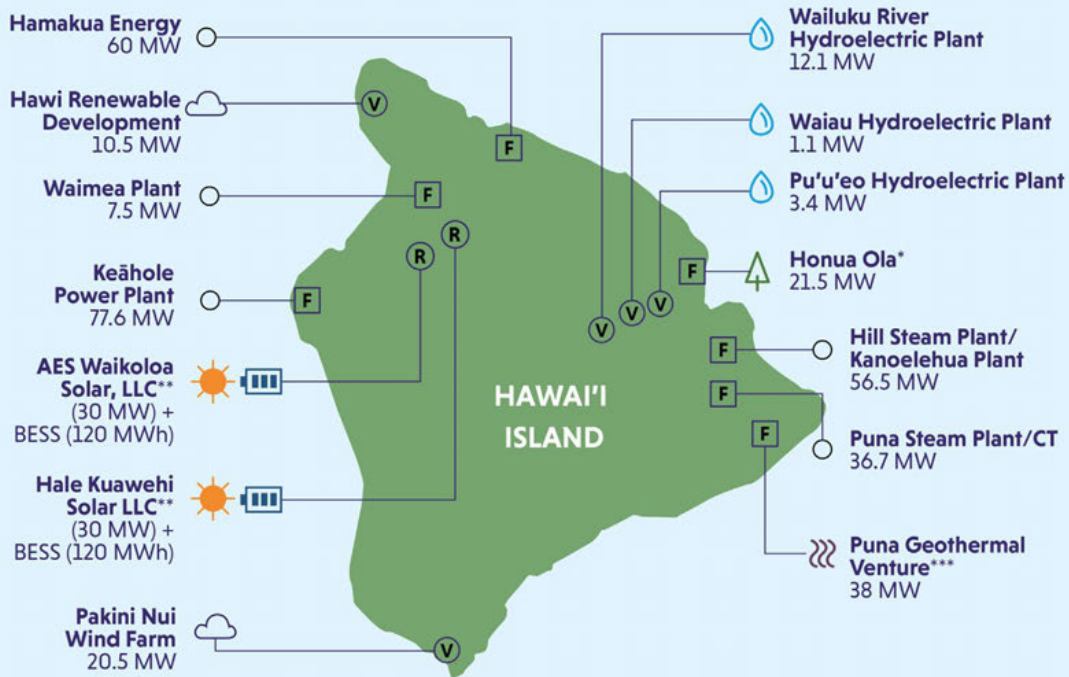
Hawai'i has many factors which must be considered when selecting renewable projects

- Land Availability
- Endangered Species
- Community Interest
- Availability of Materials
- Resilience

Grid-scale Renewables

Existing and planned generating facilities in our service area and the maximum potential power in megawatts (MW) they can produce.

-  **BIOMASS**
-  **HYDRO**
-  **STORAGE**
-  **OIL**
-  **GEOTHERMAL**
-  **GRID-SCALE SOLAR**
-  **WIND**



* AWAITING CONSTRUCTION; PUC APPROVAL ON APPEAL

** AWAITING CONSTRUCTION

*** OFFLINE SINCE MAY 2018 DUE TO VOLCANIC ACTIVITY IN LOWER PUNA / AMENDED PPA AWAITING PUC APPROVAL

F FIRM GENERATION:
Energy available on demand, which can be adjusted as needed.

V VARIABLE GENERATION:
Energy that may not always be available or controllable.

R RENEWABLE DISPATCHABLE GENERATION
BESS:
Battery Energy Storage System

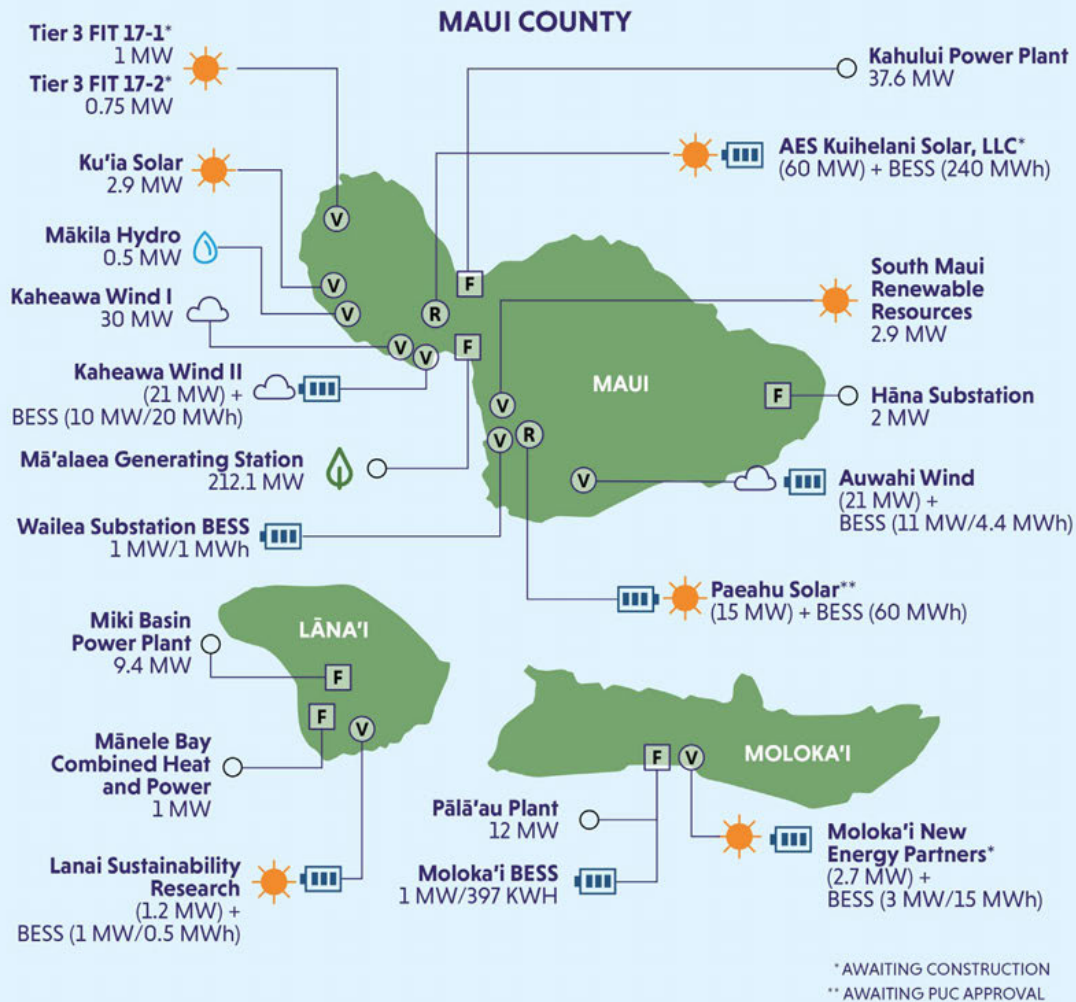
To see the current progress of each of our grid scale renewable projects, visit:

www.hawaiianelectric.com/clean-energy-hawaii/our-clean-energy-portfolio/renewable-project-status-board

Grid-scale Renewables

Existing and planned generating facilities in our service area and the maximum potential power in megawatts (MW) they can produce.

🌿 BIOFUELS
 💧 HYDRO
 ☀️ GRID-SCALE SOLAR
 🔋 STORAGE
 ⊙ OIL
 ☁️ WIND



F FIRM GENERATION:
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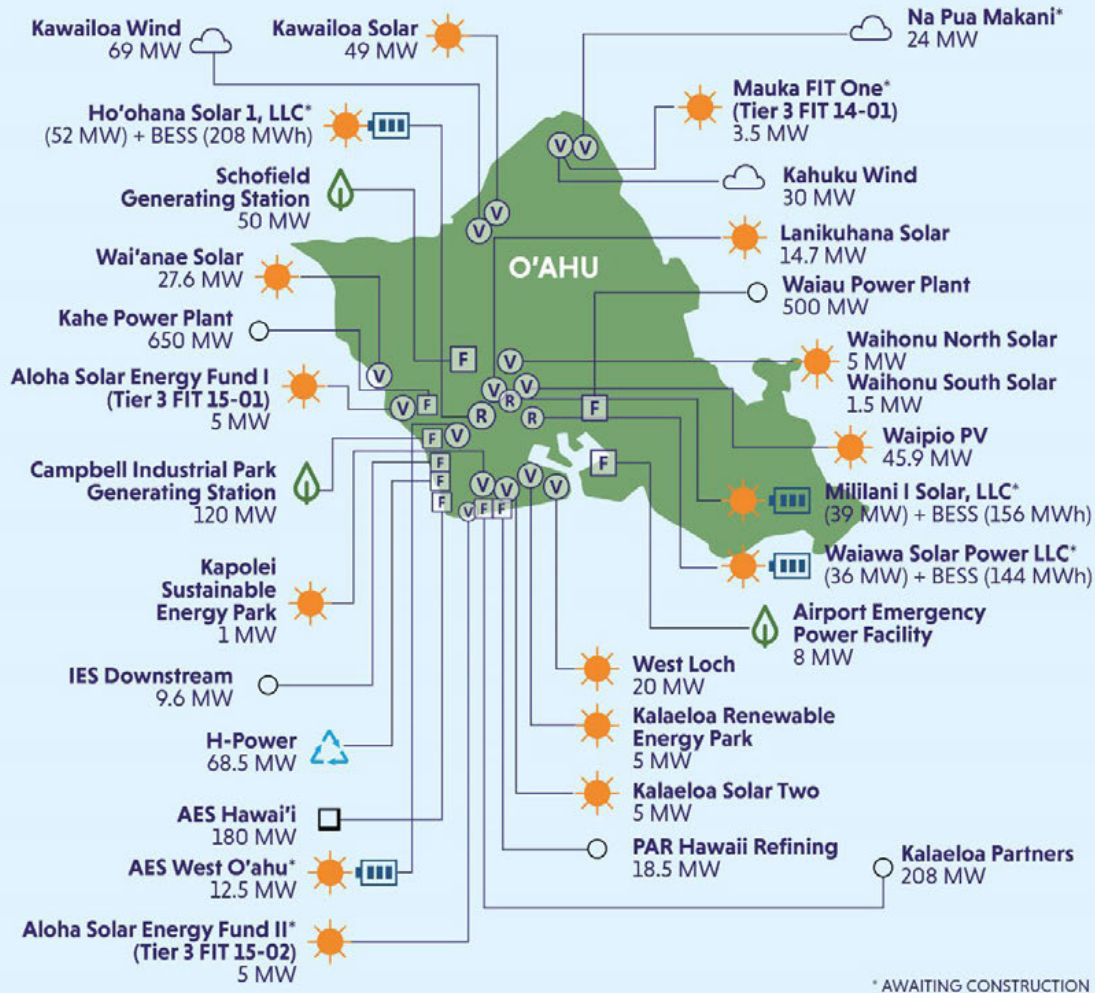
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Grid-scale Renewables

Existing and planned generating facilities in our service area and the maximum potential power in megawatts (MW) they can produce.

☘ BIOFUELS
 COAL
 ☀️ GRID-SCALE SOLAR
 STORAGE
 ○ OIL
 ☁️ WIND
 ♻️ WASTE TO ENERGY



* AWAITING CONSTRUCTION

F FIRM GENERATION:
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Rooftop Renewable Energy

For residential and small business customers who want to reduce their bills by installing solar systems that meet specific program requirements.

Rooftop Solar Options

Many customers already have rooftop solar on homes and businesses. And there are still opportunities and many options for residential and small-business customers to reduce their electric bills and help Hawai'i reach a clean energy future.

Customer Self-Supply (CSS)



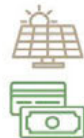
Rooftop solar system, with battery optional, designed not to export energy to grid and thus receive no bill credit. Customer pays retail rate for electricity received from grid.

Smart Export



Rooftop solar system with battery storage desirable and option to export energy to grid only 4pm to 9pm. Grid support technology is required.

Customer Grid-Supply Plus (CGS Plus)

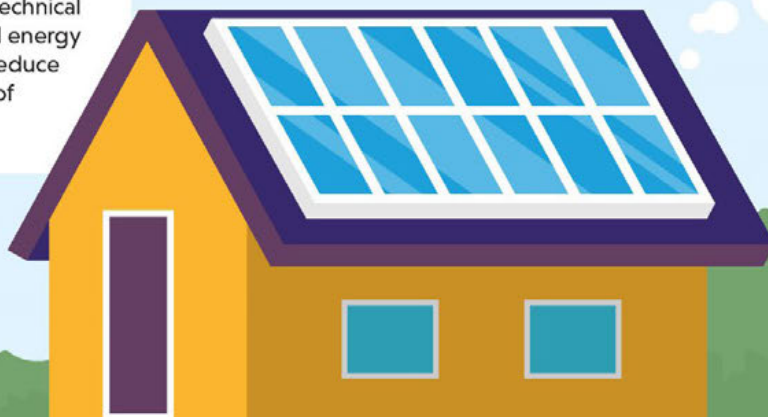


Rooftop system allowed to send energy to grid for bill credit. Grid support technology allows Hawaiian Electric to remotely monitor generation, provide technical assistance and control energy to grid if needed to reduce outages or overload of system.

Customer Grid-Supply (CGS)



Rooftop solar system allowed to send energy to grid for bill credit. Customer pays retail rate for electricity received from grid.



Rooftop Renewable Energy

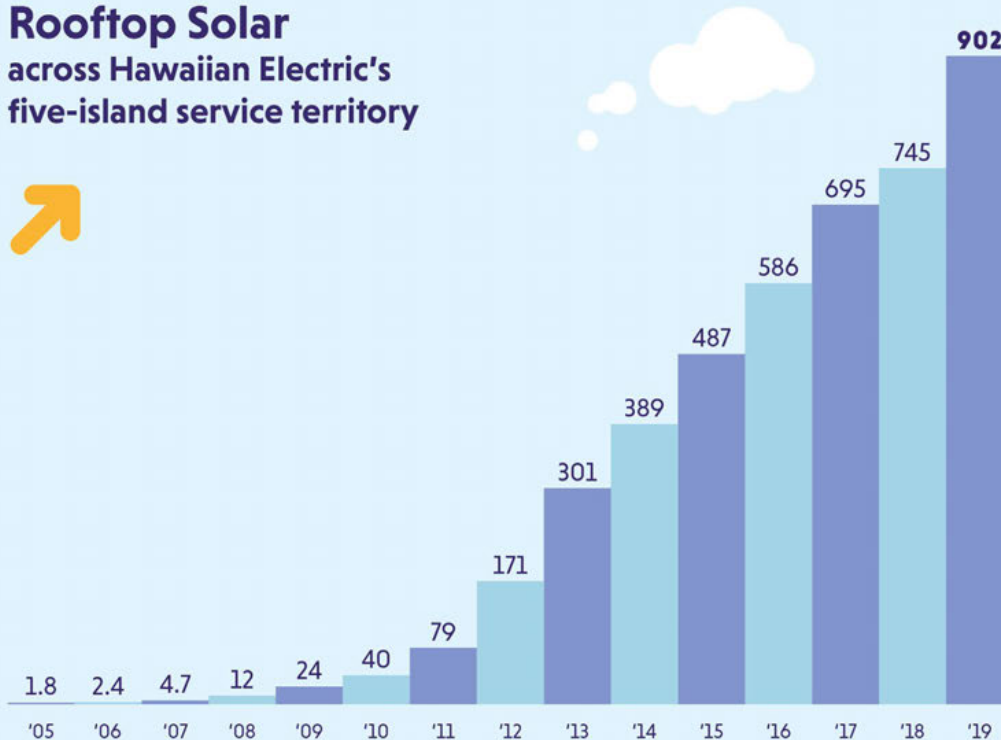
For residential and small business customers who want to reduce their bills by installing solar systems that meet specific program requirements.

Leading in Rooftop Solar

Thanks to customers, Hawai'i leads the nation in rooftop solar per capita. It's on 20% of houses statewide; 33% on O'ahu. Rooftop solar plays an enormous part in achieving a 28% Renewable Portfolio Standard in 2019.

	Rooftop Solar Systems			Capacity in Megawatts		
	Number	% Residential	% Commercial	Capacity	% Residential	% Commercial
O'ahu	55,353	96%	4%	674	45%	55%
Hawai'i	13,410	94%	6%	103	66%	34%
Maui	13,020	92%	8%	125	57%	43%
Total	81,783			902		

Rooftop Solar across Hawaiian Electric's five-island service territory



Community-Based Renewable Energy

Community-Based Renewable Energy, or community solar, provides a way for participating subscribers without privately-owned rooftop solar to benefit from electricity generated by a renewable energy facility located in their community.

The Next Phase: 'Solar without a Roof'

Customers who don't own a roof can still save money on their monthly electric bills by joining community solar. Community solar is a hybrid: owned or leased by customers who don't or can't have solar, often because they are renters or live in apartment buildings, but sized and sited like a grid-scale solar facility.

Important Roles



Subscriber

A residential or commercial electric customer who participates, by lease or purchase, in a community solar project and gets monthly bill credits to offset their electricity use.



Subscriber Organization

Company, organization or group of people who own, develop or operate a community solar project.



Administration

Hawaiian Electric administers community solar on O'ahu, Moloka'i, Maui, Lāna'i, and Hawai'i Island, supervised by the Public Utilities Commission.



Electrification of Transportation

Why Driving an Electric Vehicle (EV) is Good for our Community and All Customers

- Promotes a clean energy future for Hawai'i as clean, renewable energy is increasingly added to the grid
- Reduces need for imported oil
- Reduces fossil fuel emissions and noise pollution

Customer Benefits of Adding More EV

- Lower Cost per mile**
Save with less maintenance and fueling with electricity
- Federal Tax Incentive**
Qualify for a credit up to \$7,500
- Free Parking**
At state/municipal garages and metered stalls
- High Occupancy Vehicles/ Zipper Lane Access**
Use while driving solo
- Clean Air**
Produce fewer emissions, charge with renewables
- Customer Cost Savings**
Helps align grid needs, mainly during the day

Incentives for Customers



Nissan LEAF Rebate
Show your utility bill and save on a new Nissan LEAF



EV Charging Station Rebate
Offset costs for the commercial installation of charge stations with the state rebate administered by Hawai'i Energy.



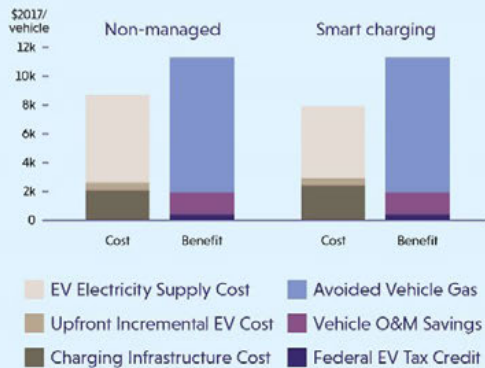
How EVs will Affect Your Electric Bill

- Customers charging EVs at home may stay on their current residential rate or may qualify for a time-of-use rate which provides an opportunity to save by using energy during certain times of day when solar power is most abundant.
- Commercial customers may qualify for a time-of-use rate for one or more charging stations on their own electric service.
- Over time, all customer will save money as more EVs charge on the grid, and have the opportunity to save more as drivers participate in Smart Charging programs that incentivize EV charging to align with grid needs.

EV Charging Locations



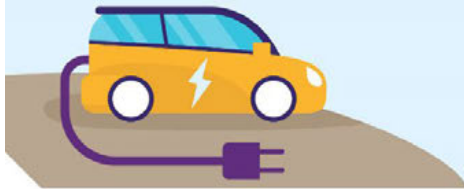
Savings



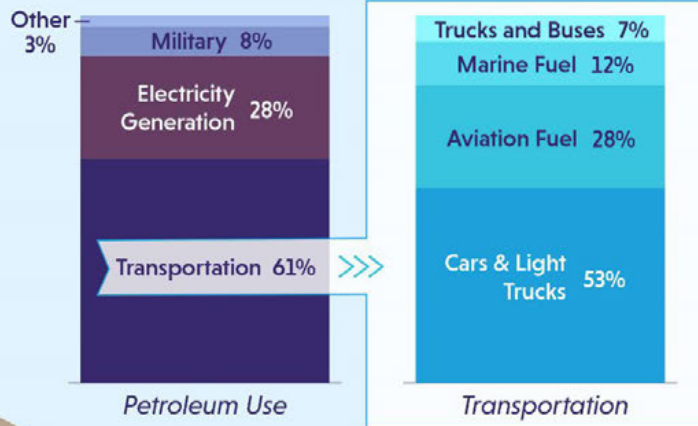
Electrification of Transportation

Electrification of Transportation (EoT) plays a key role in allowing us to integrate more renewable energy generation.

Here in Hawai'i, we are uniquely positioned to be a leader in the clean transportation revolution. Hawaiian Electric's **Electrification of Transportation Strategic Roadmap** outlines key initiatives to pave the way and achieve a clean energy future.

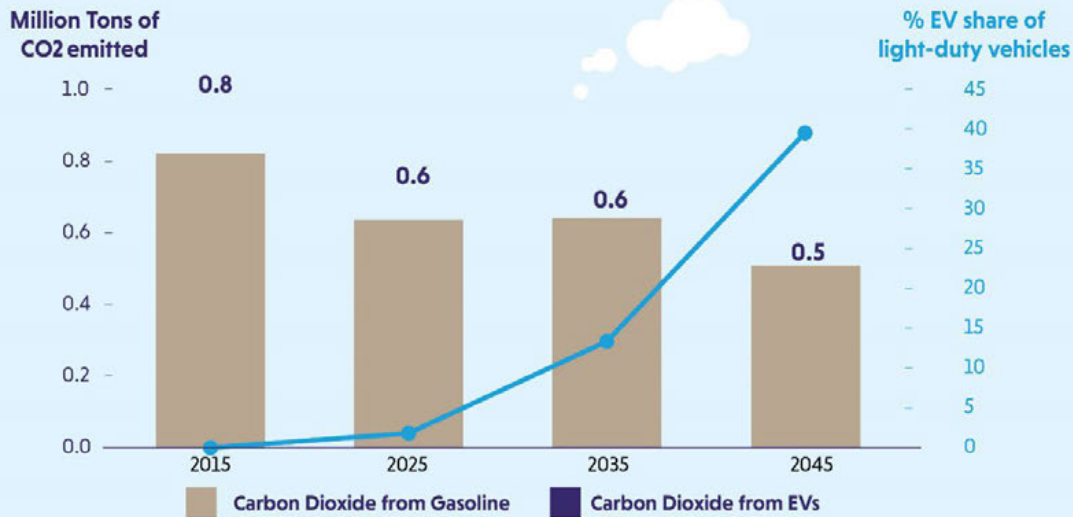


Hawai'i fossil fuel consumption by sector 2015



Reducing CO2 Emissions with Electric Vehicles

Forecasts show roughly 40% of all light-duty vehicles will be electric by 2045 on Hawai'i. This reduces CO2 emissions as the state reaches the 100% Renewable Portfolio Standard goal.



What This Means

- The state's emission of CO2 from gasoline will be reduced as EV adoption increases and there are less gasoline cars on the road.
- As more EVs are on the road and as the state transitions to meet the 100% RPS goal by 2045, CO2 contribution from EVs will decrease over time.
- Benefits not only include decreasing CO2 emissions, but also fossil fuel and noise reduction.

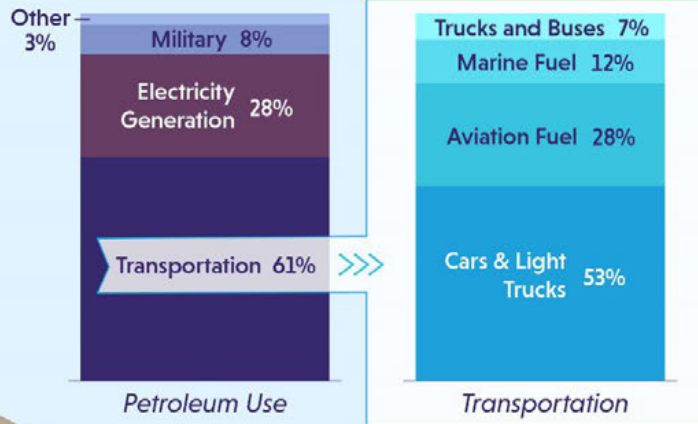
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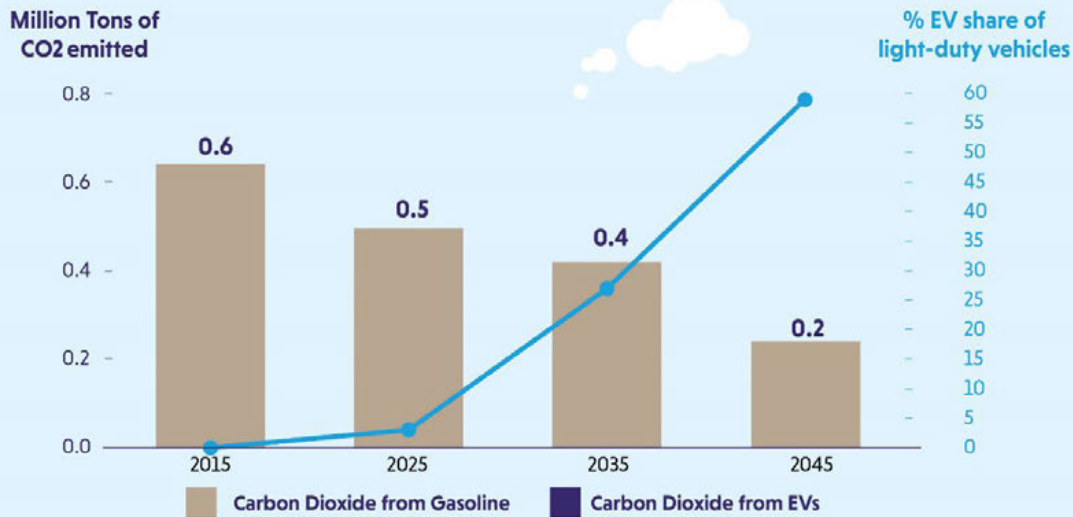


Hawai'i fossil fuel consumption by sector 2015



Reducing CO2 Emissions with Electric Vehicles

Forecasts show nearly 60% of all light-duty vehicles will be electric by 2045 on Maui. This reduces CO2 emissions as the state reaches the 100% Renewable Portfolio Standard goal.



What This Means

- The state's emission of CO2 from gasoline will be reduced as EV adoption increases and there are less gasoline cars on the road.
- As more EVs are on the road and as the state transitions to meet the 100% RPS goal by 2045, CO2 contribution from EVs will decrease over time.
- Benefits not only include decreasing CO2 emissions, but also fossil fuel and noise reduction.

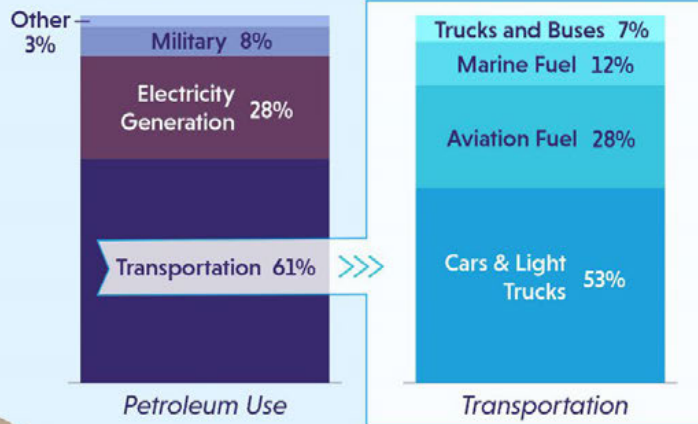
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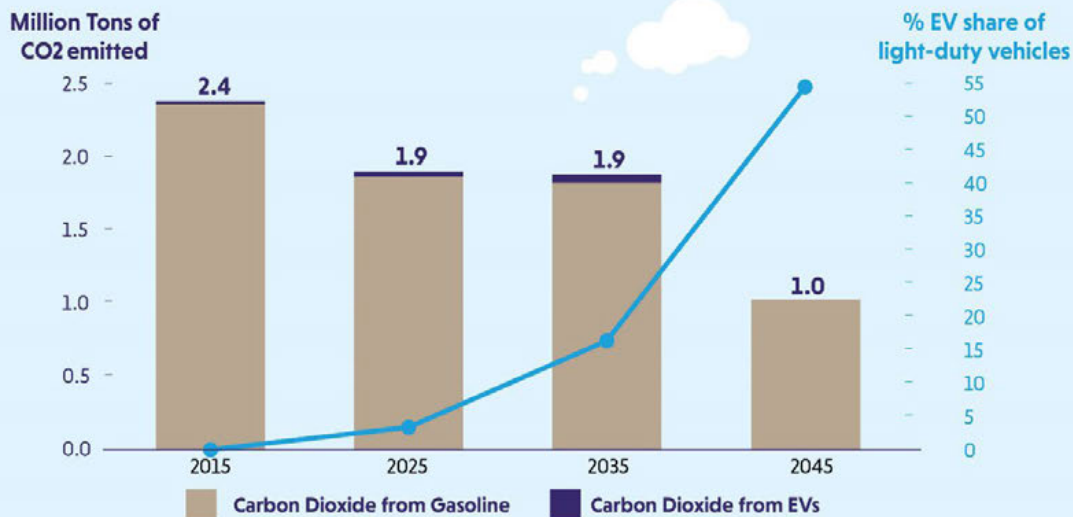


Hawai'i fossil fuel consumption by sector 2015



Reducing CO2 Emissions with Electric Vehicles

Forecasts show 55% of all light-duty vehicles will be electric by 2045 on O'ahu. This reduces CO2 emissions as the state reaches the 100% Renewable Portfolio Standard goal.



What This Means

- The state's emission of CO2 from gasoline will be reduced as EV adoption increases and there are less gasoline cars on the road.
- As more EVs are on the road and as the state transitions to meet the 100% RPS goal by 2045, CO2 contribution from EVs will decrease over time.
- Benefits not only include decreasing CO2 emissions, but also fossil fuel and noise reduction.

Resilience

“Resilience is the ability of a system or its components to adapt to changing conditions and withstand and rapidly recover from disruptions.” – Public Utilities Commission Staff

Making our Grid More Resilient

Besides strengthening our existing infrastructure and being better prepared for disasters, we must also consider the future as the grid evolves and new technology emerges. As Hawai'i moves toward 100% clean energy, we must ensure that the decisions we make will make the grid even more resilient than it is today.



Kīlauea Volcano Eruption

Key Planning Elements

- » Minimize impacts of severe events
- » Sustain mission critical functions under severe conditions
- » Rapidly recover from a severe event
- » Learn from severe events and continuously adapt

⚠️ Threat Scenarios



Hurricane



Tsunami/Earthquake



Physical/Cyber Attack



Volcano

💡 Solution Options

Here are some examples of how we can make our grid even more resilient in the future:

- » Increased emergency resources
- » Microgrids
- » Structure hardening
- » Targeted undergrounding
- » Renewable generation diversity
- » Distributed resources
- » Customer programs

www.hawaiianelectric.com/about-us/our-vision-and-commitment/resilience

Looking for a New Challenge?

A career at Hawaiian Electric is a chance to make a positive impact in Hawai'i while building a career in a fast-moving industry.

Emerging Markets

Cultivate new market opportunities in areas from electric vehicles to cutting edge renewable technologies.



New Concepts

The circular economy (an economic system aimed at continual use of resources), grid modernization, artificial intelligence (intelligence demonstrated by machines), machine learning (communication between computers and humans), and blockchain (encrypted data) are being implemented at Hawaiian Electric to meet the energy needs of our customers.



Innovative Solutions

Help generate unique solutions and use innovation to adapt to changing climate conditions and maintain reliable service for our islands.



JOIN THE TEAM



Career Information

 hawaiianelectric.com/careers

 [linkedin.com/company/hawaiianelectric](https://www.linkedin.com/company/hawaiianelectric)

 [facebook.com/HawaiianElectric](https://www.facebook.com/HawaiianElectric)

 twitter.com/hwnelectric

 [instagram.com/hawaiianelectric](https://www.instagram.com/hawaiianelectric)



Together, We Build a Better Hawai'i

Since 1891, we have been entrusted to power these islands and empower its citizens – a responsibility that has been both our mission and our honor.

Community Engagement

Our connection to customers and commitment to build a better future for Hawai'i is what drives our community service initiatives. Each year, we aim to strengthen our ties with the community through increased outreach activities and partnerships.



Educational programs

Hawaiian Electric partners with government and community organizations to reach children of all ages on topics related to energy, renewable energy, technology, engineering, math, science, emergency preparedness, electrical safety, the environment and more.



Generous Benefits

We invest in our employees by providing opportunities for rewarding careers, apprenticeship training and job advancements. We offer a competitive compensation and benefits package that includes a robust wellness program.



JOIN THE TEAM



Career Information



We Want to Hear From You

We welcome your input! Here are the many ways to stay connected with us.



Email:

IGP@hawaiianelectric.com



Website:

www.hawaiianelectric.com/igp



HawaiianElectric



hwnelectric



hawaiianelectric

Listening + Integrating + Collaborating to Reach 100% Renewables by 2045

Integrated Grid Planning

Rank the following in order of importance, where 5 is the most important to you.

Least
important

Most
important

	1	2	3	4	5
Lowering energy costs					
Helping to increase the use of renewable energy					
Adopting new technologies to provide customers with more information and control of their energy usage					
Energy reliability					
Reducing greenhouse gases					

Integrated Grid Planning

How interested are you in doing the following?	Already have/do	Actively pursuing 1-2 years	Waiting 3-5 years	Interested need more info	Not interested
Installing rooftop solar					
Installing an advanced meter					
Installing a battery storage system					
Buying an electric vehicle					
Using transit or carpooling regularly (most trips)					
Installing a grid interactive water heater					

Integrated Grid Planning Survey Questions and Input Form

Your input will help us improve future customer communications

How did you hear about this meeting?

- Social media Newspaper Radio Flyer/banner IGP Website Word of Mouth
 Other _____

In the future, what type of Integrated Grid Planning information would you be most interested in receiving? (Select up to 3)

- General updates Utility scale renewable projects Incentive programs Rooftop and community solar renewables
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 Resilience Employment opportunities
 Other _____

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

- Social media Newspaper Radio Email IGP Website Mail
 Other _____

Share any additional thoughts. We are listening!

Keep up the good work! Very informational presentation!

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

What is your age?

54

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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 Newspaper
 Radio
 Flyer/banner
 IGP Website
 Word of Mouth
 Other email

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 Other _____

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 Newspaper
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 Other _____

Share any additional thoughts. We are listening!

Demographic Questions (Optional)

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 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

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Share any additional thoughts. We are listening!

I'd like to see programs to support community power generation. One thing we have in abundance on the big island is open land. Is there a program that would help (for example) Ocean View to set up solar + wind generation for local community use?

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age? 62

Do you make the purchasing decisions for your home or business?

- Yes + No We all work together.

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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Other Email

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 Other _____

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- Social media Newspaper Radio Email IGP Website Mail

Other _____

Share any additional thoughts. We are listening!

EDUCATION PROGRAM
FINANCIAL ASSISTANCE

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

24

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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 Other _____

Share any additional thoughts. We are listening!

Very interested in some community solar in HOVE. Also interested in the virtual power plant idea

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age? 57

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Want a response to your comment?

Name _____

Email _____

Integrated Grid Planning

Survey Questions and Input Form

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 Other See below

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

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 Other _____

Why does Hawaiian Electric negotiate bad deals (Hukouma at 21¢/kwh) when solar is cheaper?
Share any additional thoughts. We are listening!

How much work is going into helping governmental, commercial & hotel operations become more energy efficient? Are they all on LED? Are they room darkening when there is no activity?

Are they architecturally efficient to reduce cooling/air conditioning?

Gas stations have ridiculous amounts of lighting at night? Sports fields at night? Why? Can't we reduce the amount of light produced & stay safe?

Also, please provide information about the electric bill increase if charging an electric vehicle.
Also landfill capture to produce hydrogen - please.

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

41

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

The amount for this is in the information sheet.

Integrated Grid Planning Survey Questions and Input Form

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Share any additional thoughts. We are listening!

→ Public education on link between climate chaos and energy use. Just as response to virus involves some simple steps - wash hands etc, public needs education on simple steps, e.g. turn off lights when out of room.

- Are you conservative in your assumptions about climate change? e.g. sea level rise of 12-15 feet?
- Does Hu Honua make any sense? Burning trees when we need for more seems foolish. or 50'
- Opening prayer at meetings should be non-denominational, not just Christian
- you need a happiness index - geothermal may make sense from a utility perspective

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age?

74

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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Share any additional thoughts. We are listening!

THESE MEETINGS ARE IMPORTANT
 TO OUR RURAL NEIGHBOR ISLAND
 COMMUNITIES. APPRECIATE THAT
 COMMUNITY MEMBERS ARE INCLUDED.
 THROUGH TEAM COVERAGE. LOTS OF
 INFORMATION. FOOD + PROFESSIONAL
 FACILITATION CERTAINLY A PLUS!

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

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Share any additional thoughts. We are listening!

Let's push to make the 100%
Renewable by 2035!

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

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Phone _____

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Share any additional thoughts. We are listening!

THIS PROGRAM SEEMED TO HAVE A VERY LIMITED REACH.
 WAS AMAZED THAT FOLKS AT THE RE-USE CENTERS
 (KEA'AU, PANA'OA, HILO & HILO HABITAT) DID NOT
 KNOW ABOUT THIS MEETING. THESE EMPLOYEES
 HAVE WIDE RANGE CONTACT WITH PEOPLE, BOTH
 BUILDING & REMODELERS, BOTH IN SALES & INTAKE OF
 MATERIALS.

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age? 63

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name T _____ d _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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Share any additional thoughts. We are listening!

Make data county-specific online; at meetings

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

22

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Want a response to your comment?

Name _____
Email _____
Phone _____

Integrated Grid Planning Survey Questions and Input Form

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 Mail
 Other _____

Share any additional thoughts. We are listening!

it's all new concept - the panelist gave a balanced perspective on IGP!

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

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 Other _____

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

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Share any additional thoughts. We are listening!

Why is Hawaiian Electric still stating on their website that "To date, there has been no conclusive evidence established by the scientific community confirming a causal link between EMF exposure and adverse health effects," after other residents' and my own testimonies and written submissions of 2017 with links (including the BioInitiative Report of 2012 and numerous other documents) proving your statement is clearly untrue? (Nobody can fool or brainwash me in this respect. Like others I know, I'm electro-sensitive and feel effects of EMFs.)

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i Lāna'i
 O'ahu Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes No

What is your ownership of your home or business location?

- Own Rent

Name _____

Email _____

Phone _____

Integrated Grid Planning Survey Questions and Input Form

Your input will help us improve future customer communications

How did you hear about this meeting?

- Social media
 Newspaper
 Radio
 Flyer/banner
 IGP Website
 Word of Mouth
 Other Baldwin Science teacher

In the future, what type of Integrated Grid Planning information would you be most interested in receiving?
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 Other _____

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

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 Mail
 Other _____

Share any additional thoughts. We are listening!

Project developers should turn back profits to the community.

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age? 42

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

- Own
 Rent

Want a response to your comment?

Name _____

Email _____

Phone _____

Integrated Grid Planning

Survey Questions and Input Form

Your input will help us improve future customer communications

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 Advanced meters
 Grid modernization
 Resilience
 Employment opportunities
 Other Be transparent (include) community input

What would be your preferred method to receive future information on Integrated Grid Planning? (Select up to 2)

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 IGP Website
 Mail
 Other _____

Share any additional thoughts. We are listening!

Begin with the End in Mind. Where will the renewable systems be disposed? Our landfills are near capacity. We cannot accommodate turbines in our landfills. We need to invest in systems that will be biodegradable.

Demographic Questions (Optional)

Where is your home or business located?

- Moloka'i
 Lāna'i
 O'ahu
 Maui
 Hawai'i (Big Island)

What is your age?

Do you make the purchasing decisions for your home or business?

- Yes
 No

What is your ownership of your home or business location?

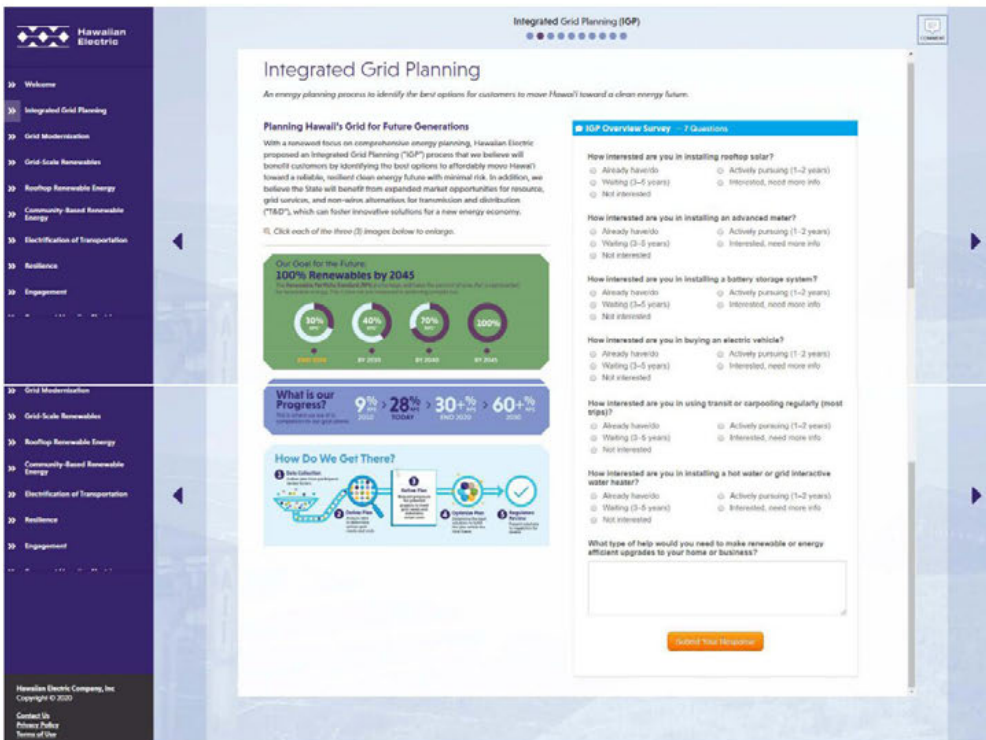
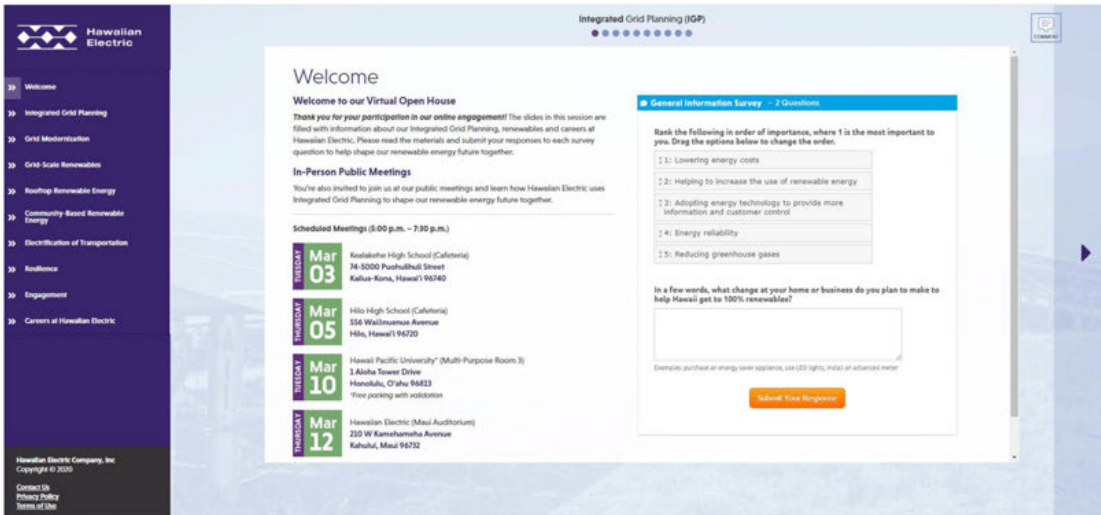
- Own
 Rent

Want a response to your comment?

Name

Email

Phone



Integrated Grid Planning (IGP)

Grid Modernization

Grid modernization is transforming our energy grid to be a dynamic, two-way stream of power, shifting back and forth between customers and Hawaiian Electric.

What's in it for the Customer?
There are several benefits of grid modernization for Hawaiian Electric customers.

Click each of the two (2) images below to enlarge.

Protecting Your Privacy
We PROTECT your information. We MONITOR your usage.

Grid Modernization | Advanced Meters
Advanced meters are an important part of our Grid Modernization Strategy. Along with the other Grid Modernization technologies, advanced meters enable customers to:

- View your daily energy usage from your phone or computer
- Manage your energy use to reduce your bill
- Help to improve restoration time during power outages
- Help Hawaii reach a 100% clean energy future

[Learn More](#)
Advanced Meters

How does Grid Modernization Technology Work?
Customers' resources are an important part of the grid. Reliability is critical as more and more customers provide resources to the grid. Learn about the new technology as we move toward changing yesterday's grid to tomorrow's grid.

Click the image below to enlarge.

[Learn More](#)
Grid Modernization Technologies

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Integrated Grid Planning (IGP)

Grid-Scale Renewables

Existing and planned generating facilities in our service area and the maximum potential power in megawatts (MW) they can produce.

Hawaiian Electric Projects
High-level snapshots of various grid-scale renewable projects around the islands are shown below. To see the current progress of each of our grid-scale renewable projects, visit our Clean Energy Portfolio.

[Learn More](#)

Clean Energy Portfolio
Click each of the three (3) images below to enlarge.

Project Selection Process
We have a process for selecting, evaluating, and contracting new renewable projects. Several parts of the process include opportunities for public engagement and input.

Click the image below to enlarge.

Opportunities for Public Engagement

IGP Stakeholder

- Write comments to PUC

Stakeholder, for comment

- Required public meeting by selected developer
- Ability to submit written comments which will also be provided to PUC

IGP Approval Process

- Write comments to PUC
- Required approval process requiring public comments

Hawaiian Electric Company, Inc.

Hawaiian Electric

Integrated Grid Planning (IGP)

Rooftop Renewable Energy

For residential and small business customers who want to reduce their bills by installing solar systems that meet specific program requirements.

Rooftop Solar Options
 These programs are the available options for new solar customers to install PV panels on their rooftops.

Click the image below to enlarge.

Customer Self-Supply (CSS)
 Rooftop solar system designed with the intent to supply energy to the grid and thus receive no bill credit. Customer pays retail rate for electricity received from grid.

Smart Export
 Rooftop solar system and battery storage with option to export energy to grid 4 pm to 9 am. Grid support technology is required.

Customer Grid-Supply (CGS)
 Rooftop solar system allowed to send energy to grid for bill credit. Customer pays retail rate for electricity received from grid.

Customer Grid-Supply Plus (CGS Plus)
 Rooftop system allowed to send energy to grid for bill credit. Grid support technology allows Hawaiian Electric to remotely monitor generation, provide technical assistance and control energy to grid to reduce surges or overload of system.

Installation Opportunities
 Many customers have rooftop solar system on homes and businesses. And there are still opportunities to install rooftop solar on your residence or business to save money and help Hawai'i reach a clean energy future.

Click the image below to enlarge.

Category	Number of PV Systems		PV Capacity, MW	
	Number	%	Capacity	%
Residential	25,450	95%	474	85%
Commercial	1,100	4%	203	15%
Total	26,550	99%	677	100%

Solar Total (in megawatts) across Hawaiian Electric five-island service territory

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Hawaiian Electric

Integrated Grid Planning (IGP)

Community-Based Renewable Energy

Community-Based Renewable Energy (CBRE), or community-solar, provides a way for participating subscribers without privately-owned rooftop solar to benefit from electricity generated by a renewable energy facility located in their community.

The Next Phase: 'Solar without a Roof'
 Community solar is a hybrid: owned or leased by customers who don't or can't have solar, often because they are renters or live in apartment buildings, but sized and sited like a grid-scale solar facility.

Click the image below to enlarge.

Important Roles

- Subscriber**
 A residential or commercial electric customer who participates, by lease or purchase, in a community solar project and gets monthly bill credits to offset their electricity use.
- Subscriber Organization**
 Company, organization or group of people who own, develop or operate a community solar project.
- Administration**
 Hawaiian Electric administers community solar on O'ahu, Molokai, Maui, Lanai and Hawaii Island, supervised by the Public Utilities Commission.

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Integrated Grid Planning (IGP)

Electrification of Transportation

Electrification of Transportation (EoT) plays a key role in allowing us to integrate more renewable energy generation.

EoT Strategic Roadmap
 Click the image below to enlarge.

For Community and Customers
 Click each of the two (2) images below to enlarge.

Why Driving an Electric Vehicle (EV) is Good for our Community and All Customers

Customer Benefits of Adding More EV

- Lower Carbon Footprint
- Reduced Air Pollution
- Reduced Noise Pollution
- Reduced Dependence on Oil
- Reduced Dependence on Foreign Oil
- Reduced Dependence on Fossil Fuels
- Reduced Dependence on Non-Renewable Resources
- Reduced Dependence on Non-Renewable Energy
- Reduced Dependence on Non-Renewable Energy
- Reduced Dependence on Non-Renewable Energy

Incentives for Customers

How EV's will Affect Your Electric Bill

EV Charging Locations

Savings

Reducing CO2 Emissions with Electric Vehicles

Electric cars emit 40% of the CO2 emissions of a gas car. This means that for every mile driven, an electric car emits 40% less CO2 than a gas car. This means that for every mile driven, an electric car emits 40% less CO2 than a gas car.

What This Means

Emissions on O'ahu
 Click the image below to enlarge.

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What This Means

Learn More
 EoT Strategic Roadmap

Integrated Grid Planning (IGP)

Resilience

Making our grid more resilient with key planning elements.

Definition and Understanding
 "Resilience is the ability of a system or its components to adapt to changing conditions and withstand and rapidly recover from disruptions."
 —Public Utilities Commission Staff

Click the image below to enlarge.

Making our Grid More Resilient

Besides strengthening our existing infrastructure and being better prepared for disasters, we must also consider the future as the grid evolves and new technology emerges. As Hawaii moves toward 100% clean energy, we must ensure that the decisions we make will make the grid even more resilient than it is today.

Key Planning Elements

- Minimize impacts of severe events
- Sustain mission critical functions under severe conditions
- Rapidly recover from a severe event
- Learn from severe events and continuously adapt

Learn More

Our Vision & Commitment

Resilience on Hawai'i
 Click the image below to enlarge.

Threat Scenarios

- Hurricanes
- Seismic/Earthquake
- Physical Cyber Attack
- Wildfires

Solution Options

Here are some examples of how we can make our grid even more resilient in the future:

- Increased emergency resources
- Microgrids
- Structure hardening
- Targeted undergrounding
- Renewable generation diversity
- Distributed resources
- Customer programs

Resilience on other islands
 Click the image below to enlarge.

Threat Scenarios

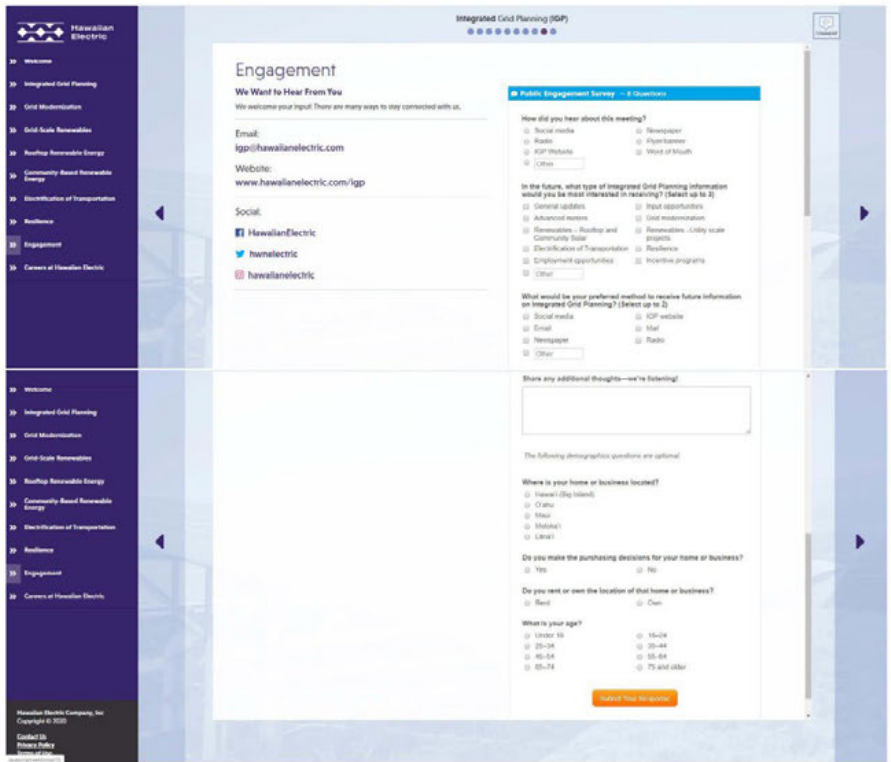
- Hurricanes
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Solution Options

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- Renewable generation diversity
- Distributed resources
- Customer programs

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Mar 2, 2020 - Mar 31, 2020

All Users
0.29% Pageviews

Report Tab



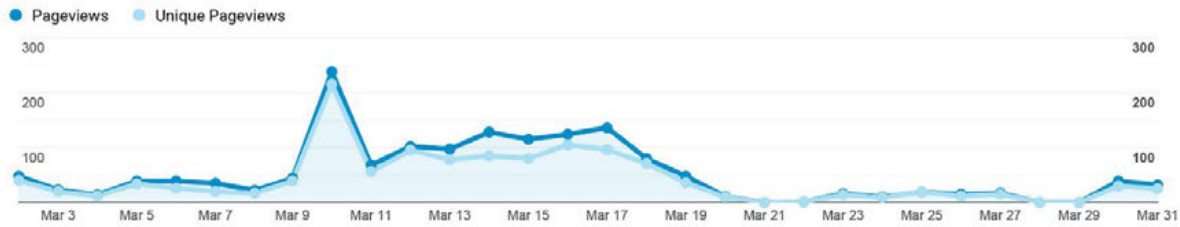
Source	Pageviews	Unique Pageviews
	1,560 % of Total: 0.29% (535,960)	1,260 % of Total: 0.29% (430,363)
1. (direct)	1,081 (69.29%)	835 (66.27%)
2. hawaiianelectric.com	115 (7.37%)	96 (7.62%)
3. m.facebook.com	67 (4.29%)	65 (5.16%)
4. ads-bidder-api.twitter.com	65 (4.17%)	53 (4.21%)
5. google	56 (3.59%)	50 (3.97%)
6. facebook.com	45 (2.88%)	45 (3.57%)
7. bing	15 (0.96%)	14 (1.11%)
8. hawaiielectriclight.com	15 (0.96%)	10 (0.79%)
9. clreemail	13 (0.83%)	12 (0.95%)
10. infohana.net	13 (0.83%)	13 (1.03%)
11. igp.hawaiianelectric.com	12 (0.77%)	9 (0.71%)
12. media.hawaiianelectric.com	11 (0.71%)	11 (0.87%)
13. eservice.hawaiianelectric.com	10 (0.64%)	9 (0.71%)
14. instagram.com	9 (0.58%)	9 (0.71%)
15. ad-review-tool.twitter.biz	4 (0.26%)	3 (0.24%)
16. ads.google.com	4 (0.26%)	3 (0.24%)
17. l.facebook.com	4 (0.26%)	4 (0.32%)
18. zoho.hdrstratcomm.com	3 (0.19%)	3 (0.24%)
19. hestaging.ingeniuxondemand.com	2 (0.13%)	1 (0.08%)
20. kuleanasurvey.hawaiianelectric.com	2 (0.13%)	2 (0.16%)
21. mauielectric.com	2	2

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Mar 2, 2020 - Mar 31, 2020

All Users
0.29% Pageviews

Report Tab



Browser	Pageviews	Unique Pageviews
	1,560 % of Total: 0.29% (535,960)	1,260 % of Total: 0.29% (430,363)
1. Android Webview	476 (30.51%)	270 (21.43%)
2. Chrome	379 (24.29%)	317 (25.16%)
3. Safari (in-app)	261 (16.73%)	253 (20.08%)
4. Edge	162 (10.38%)	153 (12.14%)
5. Internet Explorer	133 (8.53%)	126 (10.00%)
6. Safari	126 (8.08%)	119 (9.44%)
7. Firefox	11 (0.71%)	11 (0.87%)
8. Samsung Internet	8 (0.51%)	7 (0.56%)
9. (not set)	2 (0.13%)	2 (0.16%)
10. Bluebeam Revu Browser - cef version: 57.0.0.0	1 (0.06%)	1 (0.08%)

Rows 1 - 10 of 11

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Mar 2, 2020 - Mar 31, 2020

All Users
0.29% Pageviews

Report Tab



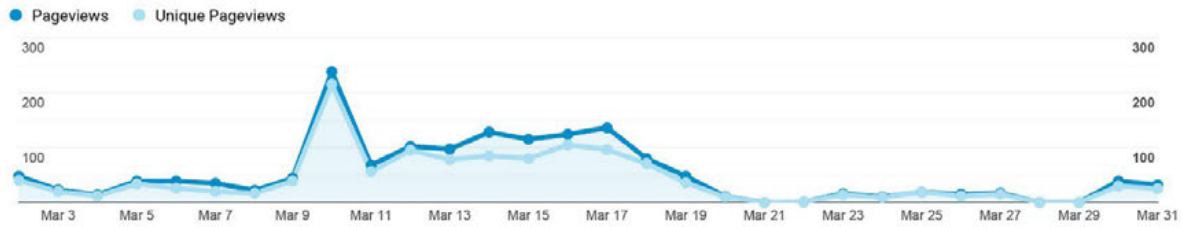
Date	Pageviews	Unique Pageviews
	1,560 % of Total: 0.29% (535,960)	1,260 % of Total: 0.29% (430,363)
1. 20200302	48 (3.08%)	40 (3.17%)
2. 20200303	23 (1.47%)	20 (1.59%)
3. 20200304	14 (0.90%)	12 (0.95%)
4. 20200305	39 (2.50%)	34 (2.70%)
5. 20200306	39 (2.50%)	26 (2.06%)
6. 20200307	35 (2.24%)	20 (1.59%)
7. 20200308	22 (1.41%)	17 (1.35%)
8. 20200309	44 (2.82%)	39 (3.10%)
9. 20200310	238 (15.26%)	215 (17.06%)
10. 20200311	68 (4.36%)	56 (4.44%)
11. 20200312	102 (6.54%)	95 (7.54%)
12. 20200313	97 (6.22%)	78 (6.19%)
13. 20200314	128 (8.21%)	85 (6.75%)
14. 20200315	115 (7.37%)	80 (6.35%)
15. 20200316	124 (7.95%)	105 (8.33%)
16. 20200317	136 (8.72%)	96 (7.62%)
17. 20200318	80 (5.13%)	71 (5.63%)
18. 20200319	48 (3.08%)	36 (2.86%)
19. 20200320	11 (0.71%)	10 (0.79%)
20. 20200322	1 (0.06%)	1 (0.08%)
21. 20200323	16	14

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All Users
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Mar 2, 2020 - Mar 31, 2020

Report Tab



Device Category	Pageviews	Unique Pageviews
	1,560 % of Total: 0.29% (535,960)	1,260 % of Total: 0.29% (430,363)
1. mobile	822 (52.69%)	612 (48.57%)
2. desktop	659 (42.24%)	587 (46.59%)
3. tablet	79 (5.06%)	61 (4.84%)

Rows 1 - 3 of 3

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Broad Public Engagement Summary

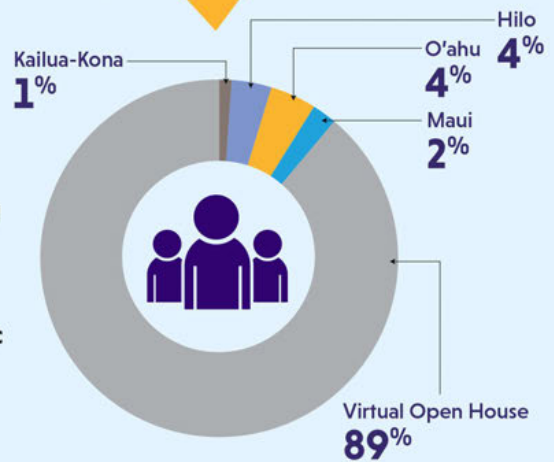
Engagement Goal:

Connect with the public by providing a general overview of the Integrated Grid Plan and gather their input on various topics.

1,421

total connections within the following groups

IGP is about being part of the conversation to shape our renewable energy future together



17 Participants	Kealakehe High School Kailua-Kona, Hawai'i 03.03.2020	52 Participants	Hilo High School Hilo, Hawai'i 03.05.2020
61 Participants	Hawaii Pacific University Honolulu, O'ahu 03.10.2020	31 Participants	Hawaiian Electric Kahului, Maui 03.12.2020



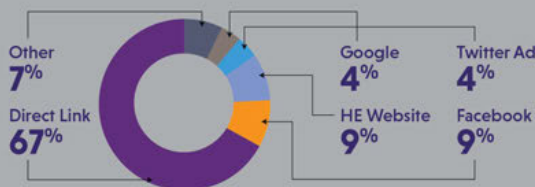
Virtual Open House = 1,260 unique visitors

Mar 02 – Mar 30*

*date extended due to COVID-19



How did people access the Virtual Open House?



How did people hear about the meeting?*

*Not all participants responded to this question



Stations

The public meetings featured several stations staffed by Hawaiian Electric representatives who provided information and answered questions on various aspects of IGP and other customer energy options, including:



Integrated Grid Planning



Grid Modernization



Grid-scale Renewables



Rooftop Renewable Energy



Community-Based Renewable Energy



Electrification of Transportation



Resilience



Careers at Hawaiian Electric

What we learned from participants

The following data represents survey and comment input from participants through our in-person and online engagement.

What is most important?



Reducing greenhouse gases



Lowering energy costs

Least important?



Helping to increase use of renewable energy



Energy reliability



New technologies to provide more information and control over energy usage

What are you doing or can you do to help?



Own and drive an electric vehicle



Switch to solar



Use energy-efficient appliances



Most common survey responses regarding interest level of the following topics:

Rooftop solar installation: Most have interest and/or already have solar installed, or waiting for installation.

Advanced meter installation: Most have interest but need more information.

Battery storage installation: Most have interest but need more information.

Buying an electric vehicle: Many have interest and/or already own an EV and many indicated they are waiting to purchase.

Regularly using transit or carpooling: Most indicated no interest.

Hot water or grid-interactive water heater installation: Many indicated interest but need more information.

Panel Discussions

The public meetings included a panel discussion with local representatives from various organizations sharing different perspectives on getting to 100% renewables.



Key discussion topics:

- Role of transportation in energy goals
- Resilience and domestic security
- Renewable and energy-efficient programs
- Connections with smaller communities
- Community solar program
- Energy cost calculations

127 comments/questions received at in-person meetings

Kona and Hilo Panelists

- Community | Carol Ignacio
- County of Hawai'i | Riley Saito, Deputy Director, Research & Development
- Geometrician Associates | Ron Terry, Principal
- Hawaiian Electric | Colton Ching, Senior Vice President, Planning & Technology
- Hawaiian Electric | Kevin Waltjen, Director, Hawai'i Island
- Hawaiian Electric | Lisa Dangelmaier, Director, System Operations, Hawai'i & Maui



Honolulu Panelists

- Community | Cynthia Rezentes, Nanakuli Neighborhood Board Chair
- City & County of Honolulu | Josh Stanbro, Chief Resilience Officer & Executive Director, Office of Climate Change, Sustainability & Resiliency
- Hawai'i Farm Bureau | Brian Miyamoto, Executive Director
- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning & Technology
- O'ahu Economic Development Board | Pono Shim, President & CEO
- Ulupono Initiative | Murray Clay, President



Maui Panelists

- Alliance for Maui Community Associations | Dick Mayer, Coordinator
- County of Maui | Michele McLean, Director, Department of Planning
- Hawaiian Electric | Colton Ching, Sr. Vice President, Planning & Technology
- Hawaiian Electric | Rebecca Dayhuff Matsushima, Director, Renewable Acquisition
- Waiwai Ola Waterkeepers Hawaiian Islands | Rhiannon Chandler-'lao, Executive Director



Email: IGP@hawaiianelectric.com
 Website: www.hawaiianelectric.com/igp



HawaiianElectric



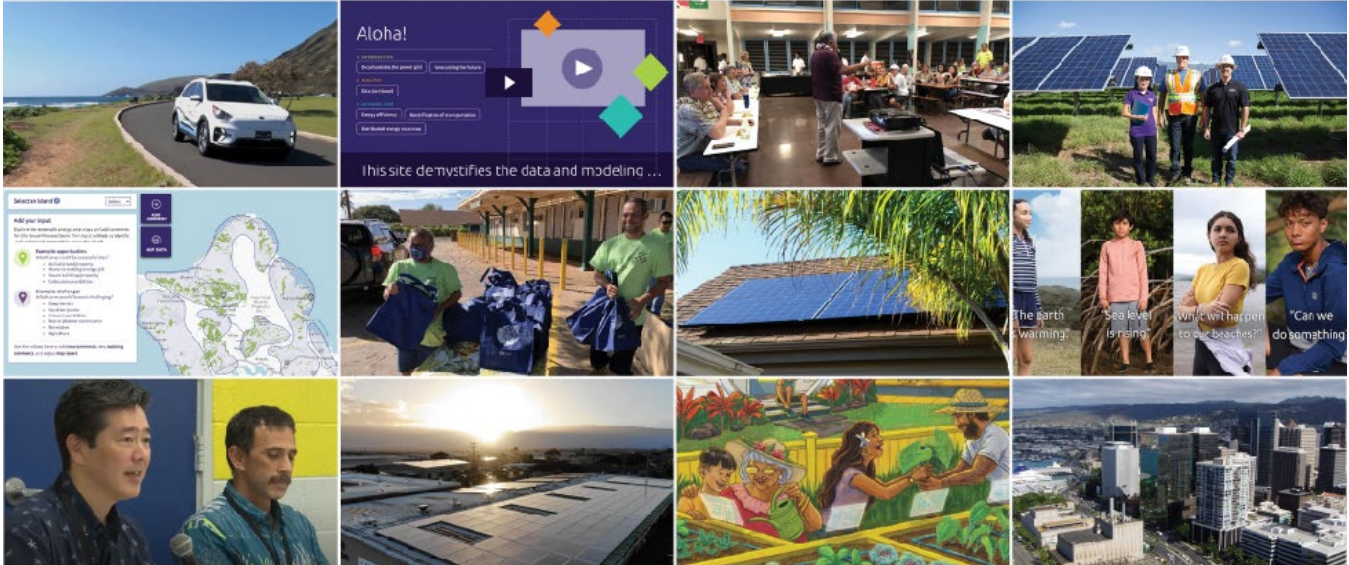
hwnelectric



hawaiianelectric

1.5 Plugged In

A blog called *Plugged In*, with monthly posts about Integrated Grid Planning milestones, features on customers and Hawaiian Electric team members, and “deeper dives” on technical subjects. A total of 12 blog posts have been posted and are available to read on Hawai‘i Powered.



Posting Date	Link	Views (as of 3/1/2023)	Reads (as of 3/1/2023)
March 11, 2022	Announcing Hawaii Powered	124	47
March 11, 2022	Shared Solar 101	93	34
April 18, 2022	Aloha from Hawaiian Electric!	63	25
April 19, 2022	What You Need to Know: 2021-2022 Sustainability Report	43	13
May 31, 2022	Non-wires alternatives	31	10
June 1, 2022	Energy Efficiency: The power to change is in our hands	59	15
July 5, 2022	Molokai residents receive kits to help save energy at home	41	12
July 6, 2022	Distributed Energy Resources: A diverse grid is a strong grid	70	21
August 1, 2022	Building Resilience in North Kohala: A collaborative approach to strengthen our communities	57	24
August 2, 2022	Electrification of Transportation: Driving toward a renewable future	84	26
September 6, 2022	Inputs and Assumptions: What does the data really mean?	61	23
November 28, 2022	Renewable Energy Zone (REZ) Maps: You know your community best	45	14

1.6 Newsletters

Monthly Hawai'i Powered e-newsletters sharing Integrated Grid Planning updates and blog post links with all project subscribers. A total of 8 e-newsletters have been released and are available to read on Hawai'i Powered.

- March 17, 2022
- April 21, 2022
- June 2, 2022
- July 12, 2022
- August 4, 2022
- September 12, 2022
- November 29, 2022
- February 28, 2023

Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Aloha friends!

We know life has been unpredictable lately, and we hope this message finds you well. Mahalo for your involvement since our integrated grid planning process began in 2019. In this newsletter, we're sharing updates on our work to reach net zero carbon emissions and power the grid with 100% local, clean energy by 2045. We call this vision "Hawai'i Powered," as it's about finding solutions for a clean energy future right here on the islands.

Clean energy for Hawai'i, by Hawai'i:

- Helps achieve state energy independence
- Expands customer energy choices and stabilizes costs
- Supports statewide efforts to reduce carbon emissions

What's the latest?

- **Visit our new public participation site at hawaiipowered.com!**
We're excited to announce a new online hub for community members to learn about and get involved in planning for a clean energy future. We invite you to explore the site's blog, community survey, information about renewable resources and answers to frequently asked questions. We'll continue to update the site in the coming months, so stay tuned for more interactive tools and opportunities to share your thoughts. Visit the site.
- **Aligning grid planning with Hawaiian Electric's Climate Action Plan**
Last fall, Hawaiian Electric announced a bold Climate Change Action Plan centered on reducing carbon emissions by 70% by 2030 compared to 2005 levels and reaching net zero carbon emissions by 2045. We are working to align our clean energy planning with these broader carbon goals. [Learn more](#)

Plugged In – Hawai'i Powered News & Updates

One feature of our new public participation site is "Plugged In," a blog that provides a deeper dive on topics related to clean energy, spotlights community stories and brings new voices to the forefront of the energy conversation. Check our latest posts, below.

Announcing Hawai'i Powered



Hawaiian Electric employees at a solar panel site in Waianae.

- Learn about the meaning behind "Hawai'i Powered," its connection to integrated grid planning and what community members can expect to find on our new public participation site.

[Read about Hawai'i Powered](#)

Shared Solar 101



Shared solar project on a business in Kahului, Maui. This 28-kilowatt project came online in 2021.

- Shared solar—also known as community-based renewable energy (CBRE). This program makes it possible for more customers to benefit from clean energy generation in their neighborhoods. But what exactly is shared solar? How do community members participate? And what is Hawaiian Electric doing to encourage more of it?
[Get answers to frequently asked questions about shared solar](#)

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by emailing the team.

Connect with our team

- [Take our short survey](#). Help us better understand you and your energy needs.
- [Request a presentation for your organization](#). Invite us to give a short presentation and answer questions at your next community meeting or event.
- Email the Hawai'i Powered team: IGP@hawaiianelectric.com
- Share this newsletter with your friends and family!

Mahalo for helping us move toward a more equitable, clean energy future!



Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Happy Spring!

This is a monthly newsletter from the Hawai'i Powered team, where we update you on our work to move toward a clean-energy future and the ways you can stay involved. Thank you for engaging with us!

What's the latest?

- **Visit our new online participation site!**

We invite you to explore our online hub for the latest information on our grid planning. This page includes a new blog, community surveys and answers to frequently asked questions. We'll continue to update this page in the coming months, so stay tuned for more interactive tools and opportunities to share your thoughts. Visit the site.

- **Check out new Inputs and Assumptions documents in the Hawai'i Powered library.**

We developed scenarios to learn how energy needs will change based on the number of electric vehicles, energy efficiency measures, rooftop solar projects, available land and future technology costs. Read the report online and stay tuned for more resources that will help make this technical topic easier to understand. Explore new Inputs and Assumptions documents.

Plugged In – Hawai'i Powered News & Updates

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Meet Colton Ching



Colton Ching, Senior Vice President of Planning and Technology

- Meet Colton Ching, who leads Hawaiian Electric's efforts to power the grid with 100% renewables by 2045. Colton's upbringing on Maui and involvement in his communities informs his approach to a Hawai'i Powered future. Learn more about Colton and his work at Hawaiian Electric.

What You Need to Know: 2021–2022 Sustainability Report



Revitalizing Communities with Streams and Sunlight
by Kate Wadsworth

Check out more artwork in *Hawaii of Tomorrow*, which envisions resourceful, sustainable islands that adapt to the challenges of the coming decades, especially climate change.

- In April 2022, Hawaiian Electric published their annual Sustainability Report. This report breaks down our progress, challenges and plans for moving toward a sustainable future. Don't have time to read the whole thing? No problem! We've provided the highlights for you in our latest blog post. Get the highlights of the 2021-2022 Sustainability Report. Read the full 2021-2022 Sustainability Report.

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by emailing the team.

Connect with our team

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Thank you for continuing to move us toward a more equitable, clean energy future. Mahalo!



Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Happy Pride Month! We hope you have a wonderful month of June!

This is a monthly newsletter from the Hawai'i Powered team, where we update you on our work to move toward a clean energy future and the ways you can stay involved. Thank you for engaging with us!

What's the latest?

- Visit our online participation site for island-specific updates! Want to know what's happening on your island? We've added island-specific updates to our participation site so you can keep a pulse on developments in your local community. [Visit updates by island](#) - While you're there, explore our online hub for the latest information on grid planning. This page includes a blog, community surveys and answers to frequently asked questions. We'll continue to update this page in the coming months, so stay tuned for more interactive tools and opportunities to share your thoughts. [Visit the site](#)

Plugged In – Hawai'i Powered News & Updates

The Hawai'i Powered blog, *Plugged In*, provides viewers with a deeper dive on topics related to clean energy, explains technical concepts, spotlights community stories and brings new voices to the forefront of the energy conversation. Check our latest posts, below.

What are non-wires alternatives?



Solar panels on a resident rooftop

Typically, moving electricity involves a complicated network of poles, wires and substations. New energy technologies are providing additional options. Learn about the benefits of non-wires alternatives (NWA) and what that means for you as a customer.

- [Learn more about Non-Wires Alternatives](#)
- [Read the Expressions of Interest for Non-Wires Alternative Grid-Scale](#)

Energy efficiency: The power to change is in our hands



Four young adults think about the future of our environment

Energy efficiency is about reducing the overall amount of electricity we consume, especially during the evening peak from 5 to 9 p.m. Reducing our energy use - especially during times of high demand - helps stabilize customer bills, reduce the risk of outages and lower greenhouse gas emissions.

- [Learn how you can become more energy efficient](#)
- [Visit our Power to Change site](#)

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by [emailing the team](#)

Connect with our team

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- [Share this newsletter with your friends and family!](#)

Thank you for continuing to move us toward a more equitable, clean energy future. Mahalo!



Hawaiian Electric



Hawaiian Electric

Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Aloha! We hope you're having a wonderful summer!

This is a monthly newsletter from the Hawai'i Powered team, where we update you on our work to move toward a clean energy future and the ways you can stay involved. Thank you for engaging with us!

What's the latest?

Next Step to Renewable Energy Projects Discussions: To replace fossil-fuel generation, we have submitted a draft request for proposals (RFP) for potentially a broad array of renewable energy projects. Join us as we share, and address community input received on the draft RFP. Participants are encouraged to ask questions and provide feedback during the meeting. These events will be recorded.

- The Oahu meeting will be held from 5:30 to 7 p.m. on Tuesday, July 12
- The Maui meeting will be held from 5:30 to 7 p.m. on Thursday, July 14
- [View previously recorded meetings here](#)

Visit our online participation site for island-specific updates! Explore our online hub for the latest information on grid planning. This page includes a blog, community surveys and answers to frequently asked questions. We'll continue to update this page in the coming months, so stay tuned for more interactive tools and opportunities to share your thoughts. [Visit the online participation site](#)

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Energy Saving Kits on Molokai



A volunteer handing out energy-saving kits to Molokai residents

These were just some of the several hundred Molokai residents who came to drive-through events hosted by Hawaiian Electric, in partnership with Hawai'i Energy and the County of Maui Department of Water Supply.

[Learn more about our event on Molokai](#)

Distributed Energy Resources: A diverse grid is a strong grid



Aerial photo of downtown Honolulu

Distributed energy resources, also referred to as DER, is about diversifying energy generation to include smaller generators located throughout the energy grid, such as private rooftop solar systems on customers' homes and businesses.

[Learn about the impacts of DER and what it means for you as a customer.](#)

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by [emailing the team](#)

Connect with our team

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- [Share this newsletter with your friends and family!](#)

Thank you for continuing to move us toward a more equitable, clean energy future. Mahalo!



Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Aloha again! We hope you're having a great summer!

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Building Resilience in North Kohala: A collaborative approach to strengthen our communities



Community forum in North Kohala

Communities have a vital role as we work together to shape our energy future and build a strong Hawai'i. One example is the collaboration between Hawaiian Electric and the North Kohala community to build resilience and improve reliability in the area.

[Learn more about the work being done in North Kohala.](#)

Electrification of Transportation: Driving toward a renewable future



Electric car driving along Sandy Beach on Oahu

Getting more folks out of their gas-burning cars and into electric vehicles will go a long way toward helping Hawaii meet its decarbonization goals.

[Learn more about electric transportation and what it means for you as a customer.](#)

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by [emailing the team](#).

Connect with our team

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- [Share this newsletter with your friends and family!](#)

Thank you for continuing to help us build a more equitable, clean energy future.

Mahalo!



Atohal

This is a newsletter from the Hawai'i Powered team with an update on our work to move Hawai'i to clean energy future. Subscribe for engaging updates!

Announcing the new Inputs and Assumptions Data Dashboard!

Forecasting the future of energy takes a lot of complicated data, which is why we're breaking down what it means for customers. We hope this tool helps explain how we leverage data to plan for how much clean energy we'll need to generate to meet future customer demand.



[Visit the Inputs and Assumptions Data Dashboard](#)

Read more about Inputs and Assumptions on Plugged In!

The Hawai'i Powered blog, *Plugged In*, provides a deeper dive on topics related to clean energy, explains technical concepts, explains community values and brings new voices to the forefront of the energy conversation.

Inputs and Assumptions: What does the data really mean?



Despite the highly technical nature of inputs and assumptions, it's crucial to share data and explain how we're planning to achieve a Hawai'i Powered future.

[Learn more about customer demand](#)

Check out other blog posts related to Inputs and Assumptions!

Energy Efficiency: The power to change is in our hands



[Learn how you can become more energy efficient.](#)

Electrification of Transportation: Driving toward a renewable future



[Learn more about electric transportation and what it means for you as a customer](#)

Distributed Energy Resources: A diverse grid is a strong grid



[Learn about the benefits of DER and what it means for you as a customer](#)

We welcome your feedback on blog posts!

Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by [submitting feedback](#)

Connect with our team

- [Join our chat group](#) - Help us better understand you and your energy needs
- [Submit a comment on your presentation](#) - Invite us to give a short presentation and a virtual tour at your next meeting or event
- [Email the Hawai'i Powered team](#) - info@hawaiipowered.com
- [Share this newsletter with your friends and family!](#)

Thank you for continuing to move us toward a more equitable, clean energy future.

Atohal!



Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i

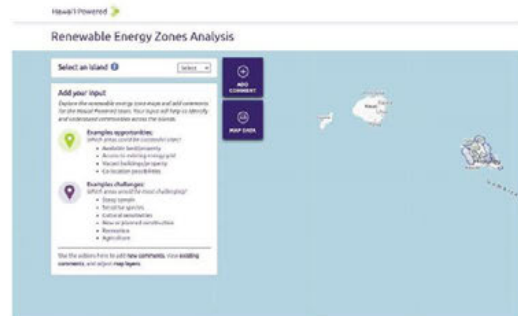


Aloha!

This is a newsletter from the Hawaii Powered team with an update on our work to move toward a clean energy future. Mahalo for engaging with us!

You know your community best, and we're looking for your insights!

To power the grid with 100% renewables by 2045, Hawaiian Electric and the National Renewable Energy Laboratory conducted a study to identify potential areas that could best host renewable energy projects. These areas are known as Renewable Energy Zones (REZ) and vary by geography, ecology, community needs and access to the energy grid. We need your partnership to deepen our understanding of opportunities and challenges within these zones.

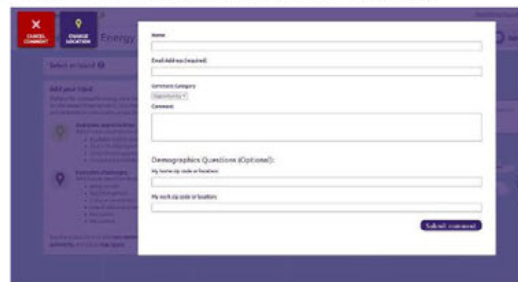


[Visit the site and share your input](#)

Read more about Renewable Energy Zones on *Plugged In!*

The Hawaii Powered blog, *Plugged In!*, provides a deeper dive on topics related to clean energy, explains technical concepts, spotlights community stories and brings new voices to the forefront of the energy conversation.

Renewable Energy Zone (REZ) Maps: You know your community best



[Learn how REZ was developed, what kind of community input we're seeking and answers to frequently asked questions.](#)

We welcome your feedback on blog posts! Is there a topic you'd like to hear more about? Have a perspective you'd like to share? Let us know by [emailing our team](#).

Connect with our team

- [Take our short survey](#). Help us better understand you and your energy needs.
- [Request a presentation for your organization](#). Invite us to give a short presentation and answer questions at your next community meeting or event.
- [Email the Hawaii Powered team: IGP@hawaiianelectric.com](mailto:IGP@hawaiianelectric.com)
- [Share this newsletter with your friends and family!](#)

Thank you for continuing to move us toward a more equitable, clean energy future.

Mahalo!



Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i



Aloha,

This is a newsletter from the Hawai'i Powered team with an update on our work to move toward a clean energy future. Mahalo!

Over the past several months, we asked you and your community to identify opportunities and challenges for grid-scale renewable energy projects on O'ahu, Maui, and Hawai'i Island. Thanks to your engagement, [we received over 500 comments!](#) [View them now.](#)

Hawaiian Electric and the National Renewable Energy Laboratory (NREL) conducted a study to identify potential areas that could best host renewable energy projects. These areas are known as Renewable Energy Zones (REZ) and vary by geography, ecology, community needs and access to the energy grid. We will use the technical data from the study, as well as your input, to reach our goal of powering the grid with 100% renewables by 2045.

Hawai'i Powered

Renewable Energy Zones Analysis

[View REZ comments](#)

More ways to stay involved

- [Read our blog, Plugged In](#), for a deep dive on Hawai'i Powered related efforts
- [Take a short survey](#) on Hawai'i Powered
- [Request a presentation](#) about Hawai'i Powered for your organization
- [Email the Hawai'i Powered team: JGP@hawaiianelectric.com](mailto:JGP@hawaiianelectric.com)
- [Share this newsletter with your friends and family!](#)

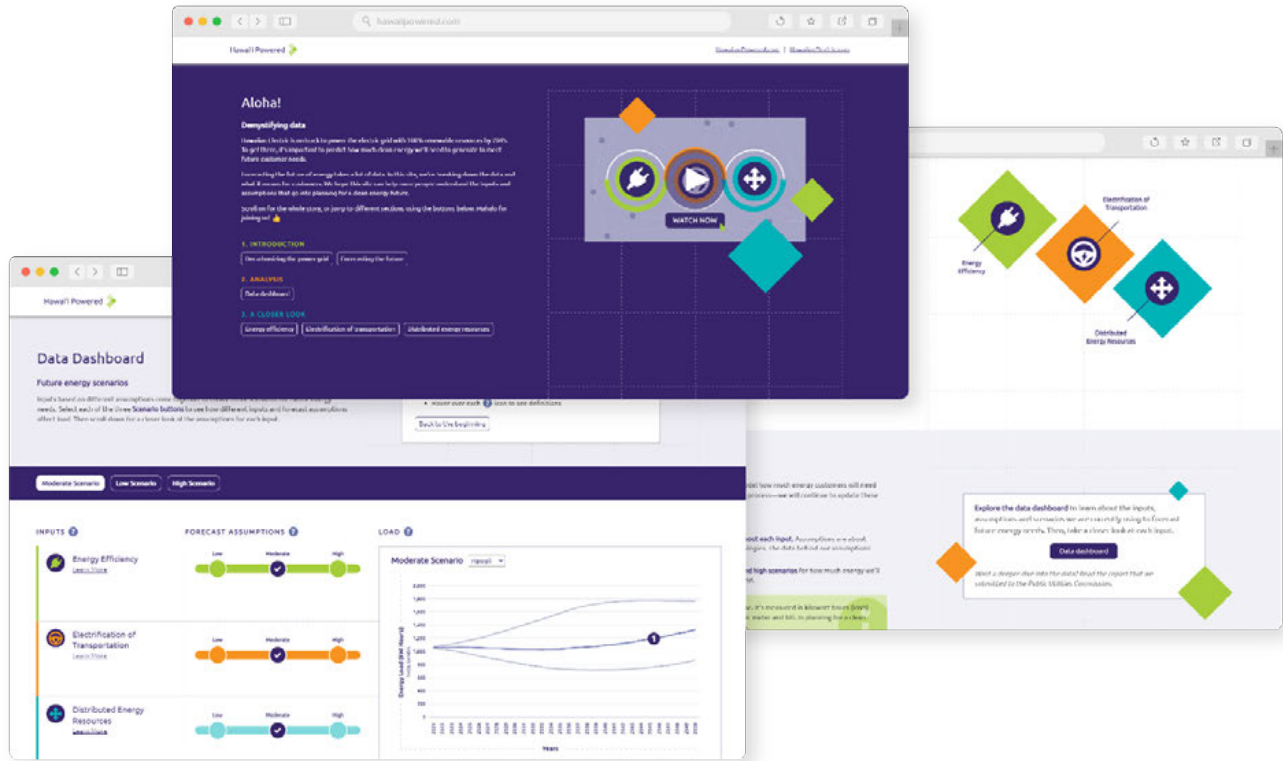
Thank you for continuing to move us toward a more equitable, clean energy future.

Mahalo!



1.7 Inputs & Assumptions

The inputs and assumptions data dashboard (hawaiipowered.com/iadashboard), provides interactive learning modules and graphs tied to the data sets we used to model future energy scenarios.



1.8 Activity Book

Hawai'i Powered activity book with energy exercises, power-up puzzles, creative coloring, and more for learners of all ages. We distributed this activity book at community events on Hawai'i Island, O'ahu, and Maui. Parents and teachers could also download the activity book at Hawai'i Powered.



Aloha! ACTIVITY BOOK

 Kid-friendly pages
for learners of all ages

Energy exercises,
power-up puzzles,
creative coloring
and more!



From the local energy experts at:



**Hawaiian
Electric**



Word Search



Locate all 15 of the words below in this grid.

Words are hidden horizontally, vertically or diagonally.

WORD LIST

HAWAII POWERED

Our vision for using 100% local, clean energy and finding solutions for a clean energy future right here in Hawai'i

COMMUNITY

A group of people, as well as a feeling of togetherness

RENEWABLE

Energy produced from sources that are naturally replenished and do not run out, like solar and wind

SUSTAINABILITY

Meeting current needs without compromising the needs and resources available for future generations

RESILIENCY

Ability and capacity to recover quickly from events and challenges like natural disasters

DECARBONIZATION

Reducing, offsetting or eliminating all sources of carbon emissions contributing to climate change

GRID PLANNING

The process of building a resilient and reliable energy grid from local, renewable energy sources

GRID SCALE

Large generation facilities and transmission infrastructure like wind turbines and solar facilities, as well as electric substations, poles and wires

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P P G U I C H R T L G W B I O M A S S U
H A W A I I P O W E R E D V X D W I M I
L M H C C V P H W Q O G R I D S C A L E
Z F X D E C A R B O N I Z A T I O N Q I
W T G N Q O M Z E L J N D R G V I T S E
I K B W K O I D O A H M X O S K J Y D F
N S R R O X D Z Z F W G W Q U K M L C F
D D W Y B I O F U E L B Q T S C O J O I
P G R I D P L A N N I N G H T M V Y M C
Y I M T X Z P D G A Z K P K A V U R M I
H L P C P M D Y L T B X L H I Y W E U E
K P J Z G E O T H E R M A L N R M N N N
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R Z N E H G L B F Q W R T N B V J W T Y
U L E R A T P Y I G A S I E I T H A Y D
J U H N S N Y H W L H G Y I L H T B U H
M F X U R G T N O K U S V M I Z U L X E
Y T M E B K K S Z B Q E X U T E X E E G
L Q N Y K L J O R N W O W G Y W G N I L
R E S I L I E N C Y J F Z P Q S A C E U
    
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EFFICIENCY

Reducing the overall amount of electricity consumed through actions and the use of energy-efficient appliances like LED bulbs

SOLAR

Energy from the sun that's converted into heat or electricity through solar thermal systems or solar panels

WIND

The motion of the wind captured and converted to electricity by turbine generators

BIOMASS

Biomass (plants, algae, restaurant grease, forestry or farming waste) can be burned to create steam for heat or to power a turbine and produce electricity

BIOFUEL

A majority of biofuel is locally produced using natural vegetable oils and fats and is intended to be used as a replacement for petroleum diesel fuel

GEOTHERMAL

Energy that comes from volcanic heat stored beneath the earth's surface like underground reservoirs of water heated by volcanic activity that can be tapped for steam to generate electricity

HYDRO ENERGY

Flowing water can be diverted out of a running stream, river or irrigation ditch and piped into a turbine which generates energy

Megawatt Calculator



Data underlies many utility decisions. Complete all 5 example calculations below.

1. A new renewable energy project generates 8 megawatts of energy. If 1 megawatt can power 1,000 homes, how many homes can this project power?

CALCULATE: $8 \times 1,000 = ?$

ANSWER:

2. There are 5 power lines that are able to carry 7 megawatts at a time. Will the 5 lines be able to carry 60 megawatts total?

CALCULATE: $60 \div 5 = ?$

ANSWER:

HINT: Is the number greater or less than 7?

3. A new solar project will generate 33 megawatts. If a power line can carry 5.5 megawatts at a time, how many power lines are needed to transmit the full 33 megawatts?

CALCULATE: $33 \div 5.5 = ?$

ANSWER:

What's a "megawatt"?

A megawatt is a unit of power equal to a million watts! Compare that to a refrigerator, which uses between 300 and 800 watts of electricity.

4. Using the table below, answer the following questions:

4a. What's the total number of megawatts the projects will generate?

CALCULATE: $40 + 33 + 35 + 39 + 30 + 38 = ?$

ANSWER:

4b. Select a pair of projects that will generate a combined total of 68 megawatts.

ANSWER:

PROJECT	TOTAL MEGAWATTS
Solar A	40
Solar B	33
Wind A	35
Wind B	39
Biomass	30
Hydro power	38

5. The school and hospital need 18 megawatts to function at full capacity. They currently receive 6 megawatts from a solar project and 8 megawatts from wind project, how many more megawatts are needed?

CALCULATE: $18 - (6 + 8) = ?$

ANSWER:

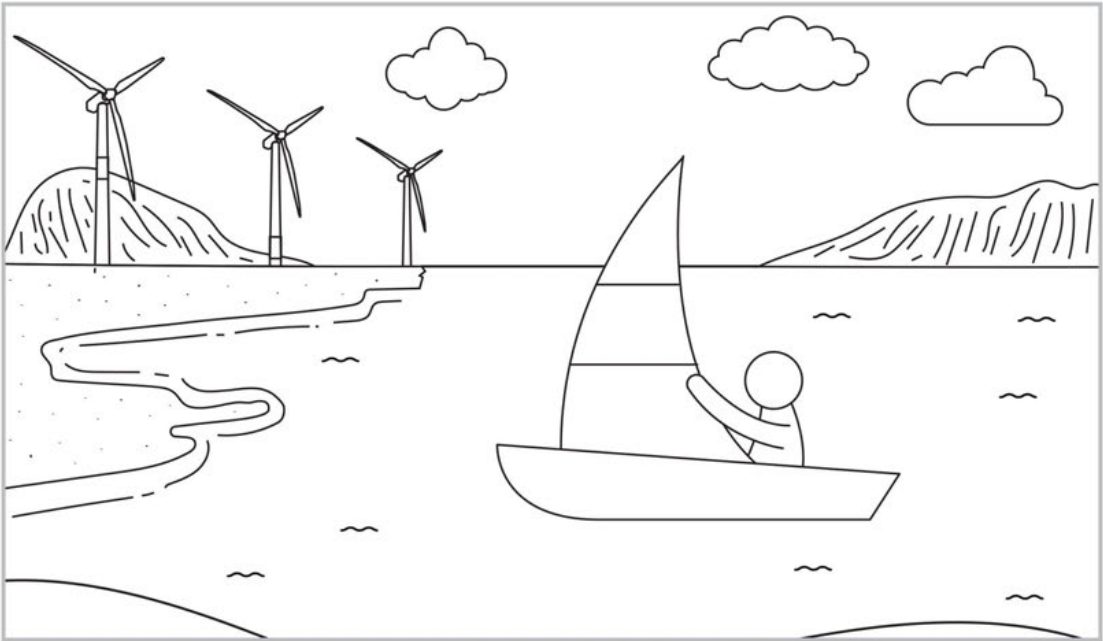
ENERGY FUN FACT

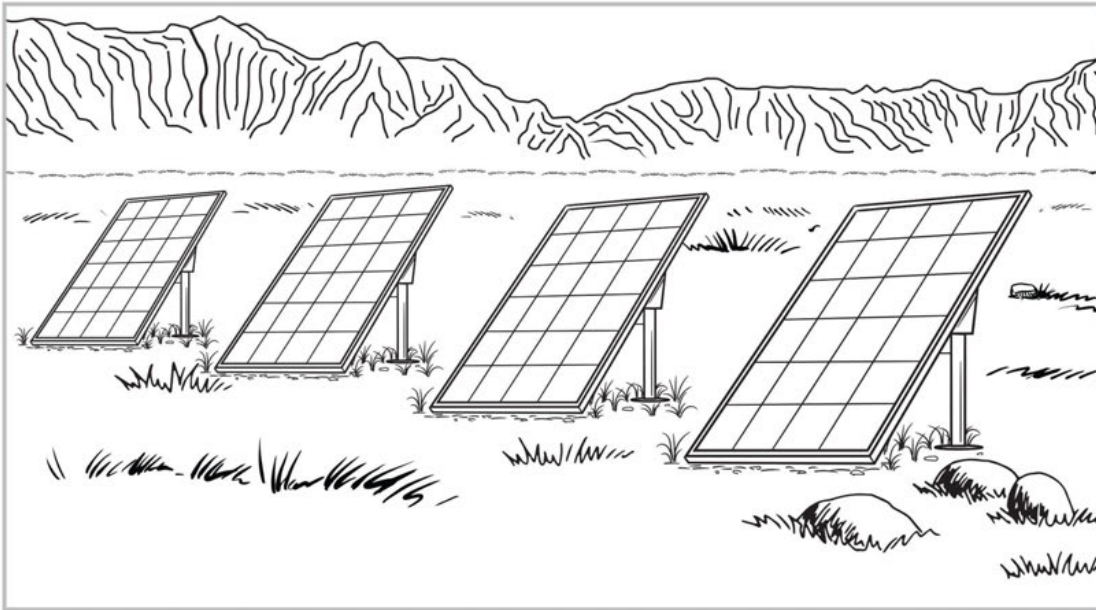


Light Emitting Diode (LED) bulbs use about 6 to 8 watts, but produce the same amount of light as a 60-watt incandescent light bulb!

Answers: 1. 8,000 2. No 3. 6 4a. 215 4b. Solar B, Wind A (33+35) or Biomass, Hydro power (30+38) 5. 4

Color & Play





Unscramble all 7 words below

UNS NSDA
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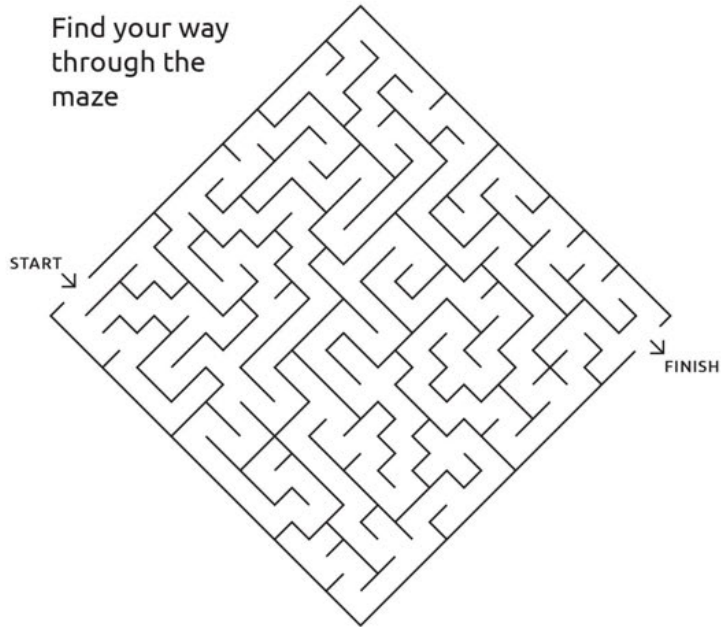
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EBNWEERAL

TSNBUIASTILI

RDAZEIIANBOTCNO

Find your way through the maze



Answers: Sun Sand Ocean Island Renewable Sustainability Decarbonization

Hawai'i Powered

Clean energy for Hawai'i, by Hawai'i

"Hawai'i Powered" is our vision for using 100% local, clean energy. It celebrates finding solutions for a clean energy future right here in Hawai'i.

GO ONLINE

Visit our public participation website for more information



Scan this code with a smartphone camera



- » **Sign up for email updates** about our latest progress and opportunities to get involved.
- » **Take a short online survey** to help us better understand you and your energy needs.
- » **Request a presentation** from Hawaiian Electric staff to learn more and answer questions at your next community meeting or event.
- » **Read "Plugged In" blog posts** for energy insights and stories.

Explore our Inputs & Assumptions Data Dashboard!

This interactive online tool presents...

- » Future energy scenarios and forecasts
- » Data downloads for each island
- » Insights on energy efficiency, electrification of transportation and distributed energy resources
- » Customer impacts and resources
- » Public input and involvement opportunities

Stay up to date on all things Hawai'i Powered

HawaiiPowered.com

1.9 ETIPP

Summary of O’ahu microgrid planning which was an outcome of Hawaiian Electric’s involvement in DOE’s Energy Transitions Initiative Partnership Project (ETIPP) to improve energy resilience and combat climate change.

SUMMARY REPORT

Resilient and Renewable Energy Community Workshops

O'ahu, Hawai'i



**Hawaiian
Electric**

October/November 2022

EXECUTIVE SUMMARY

Hawaiian Electric is seeking community input regarding long-term efforts to increase resilience and decarbonize the electrical grid for the island of O‘ahu. The recent destruction caused by hurricanes in Florida and Puerto Rico underscores the need to improve energy resilience as climate change fuels more severe weather events. Hawaiian Electric is working with the U.S. Department of Energy, National Renewable Energy Laboratory, and Hawai‘i Natural Energy Institute to develop a map that identifies opportunities for development of microgrids across O‘ahu. Microgrids allow grid-connected facilities to operate independent of the grid during a power outage using electricity from local energy resources.

In parallel with efforts to improve resilience, Hawaiian Electric is also working toward decarbonization of the energy system, consistent with their Climate Change Action Plan and the State of Hawai‘i’s goal of 100 percent renewable energy and net-zero carbon emissions economywide by 2045. As an initial step in the long-term planning process, Hawaiian Electric engaged National Renewable Energy Laboratory to conduct a data-based analysis of potential areas on O‘ahu that may be suitable for future grid-scale renewable energy projects. With community input, this analysis will be used to inform developers of potential site suitability as well as to guide planning efforts for the transmission infrastructure needed to support future renewable resource development.

Hawaiian Electric hosted six hybrid community workshops across O‘ahu to share information and solicit community input regarding the microgrid mapping and renewable energy zone analysis. Specifically, the workshops were designed to collect community insight on specific facilities that should be prioritized for microgrid development, as well as factors that should be considered in siting renewable energy resources. The community workshops were held in each of the six moku (districts) across O‘ahu, as listed below. Notices regarding the workshops were sent to elected officials, neighborhood boards, and energy-related groups and organizations. In addition, a news release was sent to various media outlets and promotional news stories ran in the Star Advertiser and Pacific Business News (see Attachment A). Each workshop included an open house (in-person only) followed by a hybrid community workshop (in-person and via Zoom). The workshops were also livestreamed and recorded by ‘Ōlelo Community Media.

- Ko‘olaupoko Moku (Waimea – Ka‘a‘awa): Monday, October 24 at Kahuku Elementary School
- Wai‘anae Moku (Nānākuli – Keawa‘ula): Wednesday, October 26 at Agnes Kalaniho‘okahā Community Learning Center
- Kona Moku (Moanalua – East Honolulu): Tuesday, November 1 at Kapi‘olani Community College
- Waialua Moku (Ka‘ena – Kapaeloa): Thursday, November 3 at Waialua Elementary School
- Ko‘olaupoko Moku (Waimānalo – Kualoa): Tuesday, November 15 at Windward Community College
- ‘Ewa Moku (Honouliuli – Hālawa): Thursday, November 17 at Leeward Community College

Community members were able to provide feedback at each of the workshops in various formats, including verbal comments (both in-person and via Zoom), online through the Zoom chat function, as

well as through Menti. Additional options for submitting input following the workshops were also provided, including via an interactive website (www.hawaiipowered.com) and email (igp@hawaiianelectric.com).

Overall, community members voiced an interest in increased resilience and energy equity. Key messages related to the following topics:

- Development of microgrids and renewable energy projects must factor in energy equity;
- Siting renewable generation only in locations where resource and land are available will not support energy resilience;
- Grid-scale renewable generation should be hosted in a variety of communities, not just those in rural areas;
- Cost to develop microgrids and renewable energy must be factored into the decision-making process; and
- The concept of hybrid microgrids requires careful explanation to facilitate understanding.

This report includes a synopsis of the technical information shared by Hawaiian Electric at each of the workshops followed by a detailed summary of the community input received.

TECHNICAL PRESENTATION

Introduction

Hawaiian Electric hosted Renewable and Resilient Energy Community Workshops across the island of O‘ahu, one in each of the six moku (districts). Following is a summary of the introductory remarks and technical presentation provided at each workshop; a copy of the presentation slides is contained in Attachment B. Community feedback received at each meeting is summarized in subsequent sections of this report.

Overview

Opening remarks were provided by Kurt Tsue, Director of Community Affairs at Hawaiian Electric. He explained that the purpose of the workshops is to address two separate but related topics relating to increasing resilience and decarbonization of the electric grid: (1) hybrid microgrids and (2) renewable energy zones. The workshops are structured to provide presentation of technical information for these



two topics, each followed by an opportunity for community members to ask questions and provide input. He stated that the workshop format is intended to increase accessibility and community participation by allowing for attendance either in-person or online through Zoom, as well as via a live broadcast and recording provided by ‘Ōlelo Community Media. He noted that all of the information shared at the open house is also part of the workshop presentation; the benefit of the open house is the opportunity

for community members to talk story with subject matter experts. He also emphasized that these are long-range planning efforts and there will be ongoing opportunities to provide input in the future.

He introduced the speakers and others available for questions throughout the workshop, including Ken Aramaki (Director of Transmission, Distribution and Interconnection Planning at Hawaiian Electric), Marc Asano (Director of Integrated Grid Planning at Hawaiian Electric), Katy Waechter (Geospatial Science Researcher at the National Renewable Energy Laboratory), and Colton Ching (Senior Vice President of Planning and Technology at Hawaiian Electric). In addition, he introduced Alani Apio (Kamau LLC) as the workshop facilitator. He also recognized the Center for Resilient Neighborhoods (CERENE) as a partner organization that is engaging with communities at the grassroots level to increase resilience through development of resilience hubs, which dovetails with the concept of microgrids.

Kurt explained that Hawaiian Electric has an obligation to provide reliable electrical service, as well as stabilize energy costs by transitioning off fossil fuels. He acknowledged that this is a very challenging time in terms of electricity costs and stated that Hawaiian Electric is open to continuing conversations on this topic if desired. He explained that the purpose of the Renewable and Resilient Energy Workshops is to address the transition to renewable energy as well as the need for increased resilience in light of

climate change. Recent events in Puerto Rico and Florida underscore the importance of addressing these issues as soon as possible, especially given Hawai'i's vulnerability as an island state in the middle of the Pacific Ocean. The first portion of the workshop relates to microgrids; there are different types of microgrids, but the workshop is focused on hybrid microgrids to support disaster and emergency preparedness. Hybrid microgrids improve energy resilience by ensuring backup power to critical facilities (such as medical facilities, community gathering places, food storage facilities) during a grid outage. Implementation of a hybrid microgrid involves islanding (sectioning off) facilities which are typically energized through the island-wide electric grid, allowing for continued power during a grid outage from local energy resources. Hawaiian Electric is seeking input from the community regarding whether microgrids should be considered in their community, and if so, what facilities should be included. The second portion of the workshop relates to efforts to decarbonize O'ahu's energy system by incorporating grid-scale renewable energy generation. He emphasized that a lot of changes will need to be made to fully transition to renewable energy and current efforts are focused on how best to bring renewable energy projects online to achieve decarbonization goals in a manner that meets the community's needs. Hawaiian Electric is seeking community input regarding the factors that should be considered in siting these types of large-scale renewable energy projects.

Kurt acknowledged that these are difficult concepts to navigate but are extremely important to address in planning Hawai'i's energy future. He stated that Hawaiian Electric has traditionally focused on providing technical engineering solutions that ensure a safe and reliable electrical grid but has come to understand the importance of balancing these technical requirements with community priorities and needs. In particular, he acknowledged the importance of understanding how communities may be affected by efforts to improve resilience and decarbonize the energy system, and the need to incorporate community input proactively rather than after the fact. He specifically acknowledged recent efforts by the West O'ahu/Kalaeloa Clean Energy 'Ohana, which involved aligning community interests and filing specific recommendations with the Public Utilities Commission (PUC) to allow for better community involvement in the renewable energy planning and development process. Building on these efforts, he explained that Hawaiian Electric is committed to further improving existing processes to facilitate community engagement. As part of this commitment, Hawaiian Electric is trying to level the playing field by sharing the same information that is used by utility engineers and developers in a format that is more accessible to the community; this information is being shared as part of this workshop with more detail provided at www.hawaiipowered.com. The goal is to make it easier for the community to participate in renewable energy and resilience planning efforts. Input received from the community will be documented in a report that will be submitted to the PUC on behalf of the community and incorporated into the planning process. In addition, the information will be visible to others involved in the planning process including developers and state agencies such as the Hawai'i State Energy Office. Kurt emphasized that this is a long-term effort and there will be continuing opportunities for community input and participation moving forward.

Hybrid Microgrid Mapping Project

Ken Aramaki, Director of Transmission, Distribution and Interconnection Planning at Hawaiian Electric, presented information regarding the hybrid microgrid mapping project, which is a current initiative to improve resilience of Hawaiian Electric's island-wide electrical grid. Grid resilience is critical to maintaining community lifelines, which are those services essential for human health and safety as well as economic security. Community lifelines include things such as energy, communications, health and medical, transportation, food, water and shelter. Community lifelines are generally interdependent; however, energy is central to all community lifelines. As such, Hawaiian Electric is trying to identify opportunities to improve resilience of the electrical grid so that energy availability may be more reliable to maintain community lifelines during emergency situations.

Basic knowledge of the electrical grid structure is helpful for understanding the concept of microgrids. Hawaiian Electric's electrical grid was originally built to provide a one-way flow of energy to customers, originating with bulk generation at various power generation plants. The high voltage energy from these generators is transported through a transmission network with the voltage incrementally stepped down through a series of substations, then is ultimately delivered as low voltage electricity to individual customers. The system has been modified in recent years to accommodate the addition of new energy resources from independent power producers, including solar photovoltaic, wind farms, and energy storage systems; although not originally designed for these additions, the grid has been modified to allow for interconnection at various voltage levels and at different points throughout the system. In addition, customers have also added distributed energy resources (such as rooftop solar, batteries, and diesel generators) to their individual properties through various programs, in many cases to offset electricity costs.

Recent technological advancements have allowed for distributed energy resources to function as a microgrid, which allows customers to continue receiving electricity in the event of a broader grid outage. For example, it is possible for customers with rooftop solar photovoltaic panels and batteries to configure the system behind their electrical meter in a manner that allows for power to be maintained at their individual home or business in the event of an emergency. Other examples include commercial customers that use diesel generation to provide power independent of the grid. These types of microgrids generally serve a single customer and are referred to as customer microgrids. Hawaiian Electric recently created a microgrid services tariff that allows for both customer microgrids as well as larger microgrids involving multiple customers (referred to as hybrid microgrids). A hybrid microgrid consists of a cluster of customers located proximate to one another, each of which is individually served by the utility on a normal day-to-day basis. To develop a hybrid microgrid, the utility infrastructure (e.g., poles and lines) connecting these customers is hardened and electrically sectioned off from the broader electrical grid. During a grid outage, the customers within the hybrid microgrid may be powered using the aggregate of those customers' localized generation resources, delivered across the microgrid via utility infrastructure.

Upon launching the microgrid services tariff, Hawaiian Electric realized that customers may not be able to easily identify opportunities where microgrids are feasible as they are technically complex systems and require an understanding of the electrical grid. Around that same time, Hawaiian Electric applied and was selected to participate in a new program funded by the Department of Energy (DOE), referred to as the Energy Transitions Initiative Partnership Program (ETIPP). The program provides technical assistance to remote and island communities seeking to transform their energy systems and increase energy resilience through strategic energy planning. Through this program, Hawaiian Electric is working with National Renewable Energy Laboratory (NREL), Sandia National Laboratories, and Hawai'i Natural Energy Institute (HNEI) to identify specific locations on O'ahu that may be well suited for a hybrid microgrid based on technical, reliability, and resilience-related characteristics. The results of this analysis will be presented on community-based maps that can be used by customers to understand if a hybrid microgrid is a viable solution for their community and specific locations where microgrids could be used to improve the electrical infrastructure resilience.

Katy Waechter, Geospatial Science Researcher III at NREL, presented additional detail regarding the hybrid microgrid mapping process. She explained that the goal of the mapping effort is to identify potential microgrid locations at the parcel level. Three categories of criteria were initially identified to evaluate site suitability, as described below. She stressed that although potential microgrid sites may be determined based on a single criterion, the goal of the analysis is to identify areas where the criteria overlap as these are locations where microgrids would be expected to have the greatest impact.

- **Criticality** incorporates critical loads, facilities, and services within a given community, particularly those that directly impact human health and safety during an emergency. Specifically, this category includes emergency facilities and services (such as emergency shelters, fire stations, and emergency option centers), medical facilities and services (such as hospitals, surgical centers, and nursing homes), and critical infrastructure (such as water sources, transmission towers, bridges, ports, and airports).
- **Vulnerability** addresses those parts of the grid currently and projected to endure the longest or most frequent outages based on factors including natural hazard risk (such as tsunami evacuation zones, flood hazard zones, and sea-level rise inundation areas), remoteness and accessibility (based on the relative density of transportation and electrical transmission infrastructure in any given area), and grid reliability (based on Hawaiian Electric data regarding grid outages over a 10-year period [2011-2021]).
- **Societal Impact** focuses on locations that would significantly impact communities if they lost power. This category includes residential care facilities, community homes, schools, daycare facilities, and libraries. To ensure equity and accessibility to microgrid opportunities, this category also focuses on populations that may be disproportionately affected by outages including customers receiving assistance (such as the Asset-Limited, Income-Constrained, Employed [ALICE] program), disadvantaged communities (in accordance with DOE's definition which follows the Biden Administration's Justice40 Initiative and incorporates 36 different metrics of burden), as well as Hawaiian homelands, IRS Opportunity Zones and other similar metrics.

The mapping exercise, which covers the entire island of O‘ahu, includes dozens of spatial datasets for these three categories of criteria as well as information specific to Hawaiian Electric’s distribution network. In addition, the mapping incorporates a model used to determine where electricity demand is balanced with grid-connected customer energy resources (e.g., rooftop solar panels, batteries, etc.), as these may be locations where microgrids could be most easily developed with minimal upgrades. The maps resulting from this initial effort were shared in the presentation and are available online at www.hawaiipowered.com/etipp; however, the maps are considered incomplete as they do not yet reflect community-based knowledge. As such, Hawaiian Electric is seeking community input regarding additional criteria that should be included in the analysis as well as any specific facilities that should be considered for a hybrid microgrid. Of particular interest are facilities that may not be included in public datasets but are



important to the community, such as those locations where people gather during and following emergency events. There are multiple options for providing input including in-person and virtual tools offered during the Renewable and Resilient Energy Workshops as well as online at www.hawaiipowered.com/etipp; details for contributing input are provided below. All input received will be considered and incorporated into the analysis as appropriate. The resulting site-specific maps, which will ideally show where the various criteria and community resources meet, will be shared with the community as a resource for evaluating potential locations for hybrid microgrids.

Renewable Energy Zones

The workshop also included a presentation regarding long-term planning to meet Hawai‘i’s decarbonization goals; this information was presented by Ken Aramaki and Marc Asano, Director of Integrated Grid Planning at Hawaiian Electric. They started by explaining that decarbonization of the energy system is a critical component of mitigating climate change, the effects of which are being increasingly realized in Hawai‘i and elsewhere around the world. The State of Hawai‘i has established goals of achieving net zero carbon emissions and 100 percent renewable energy by the year 2045 (with interim targets by 2030). Hawaiian Electric’s Climate Change Action Plan includes commitments consistent with these goals to reduce carbon emissions by 70 percent compared to 2005 levels by 2030. Achieving these commitments will require significant changes over the next 20 years, including development of the necessary renewable energy resources as well as the transmission infrastructure needed to deliver those resources. As energy infrastructure typically takes at least 10-15 years to develop, near-term action is needed to work toward these commitments.

Long-term planning to support the transition to a decarbonized electrical system is being addressed as part of Hawaiian Electric's Integrated Grid Planning (IGP) process. The goal of these efforts is to develop and implement a plan for a clean energy grid that meets the established timelines (accounting for the time needed to build the supporting transmission infrastructure to support renewable resource development), stabilizes customer costs, balances competing land uses (including affordable housing and agriculture), minimizes community impacts, and improves overall energy resilience. Given the range of planning considerations and technical complexities, this will require a focused and coordinated effort across the board, including the community.

Currently, Hawaiian Electric has an as-available renewable capacity of approximately 1,143 megawatts on the island of O'ahu. This capacity includes the various existing renewable energy projects (e.g., solar photovoltaic and wind energy) and is considered as-available because the energy availability is dependent on weather conditions and/or time of day (e.g., when the sun is shining or wind is blowing); the majority of this as-available renewable capacity (763 megawatts) is associated with customer-sited resources such as rooftop solar. An additional 384 megawatts of solar energy resources is currently in development; these are generally large, grid-scale projects that were selected as part of Hawaiian Electric's Stage 1 and 2 competitive procurement processes and are in the process of being brought online. In addition to providing additional renewable energy resources, these projects also include a storage component (e.g., batteries) which allows for the energy to be used during periods with the greatest demand. Despite all of these renewable resources, Hawaiian Electric still heavily relies on firm generation sources to maintain grid reliability; the total firm capacity is approximately 1,614 megawatts, of which only about 126 megawatts is from renewable sources. The goal is to phase out the non-renewable firm capacity, which will need to be offset with either renewable firm capacity or larger amounts of as-available capacity.

To adequately displace existing firm non-renewable resources in order to achieve 100 percent renewable energy by 2045, both distributed energy resources as well as grid-scale resources must substantially increase. To better understand the potential for distributed energy resources, Hawaiian Electric worked with NREL to map opportunities for rooftop solar across O'ahu. This mapping exercise indicated that there is significant potential for rooftop solar and Hawaiian Electric recognizes that this component is critical to Hawai'i's clean energy future. Regardless, it is not possible to achieve a fully decarbonized energy system without grid-scale renewable resources.

Grid-scale renewable energy projects are currently developed through a competitive bidding process in which Hawaiian Electric identifies capacity on their system to receive renewable energy resources and issues a Request for Proposal (RFP). Developers work directly with individual landowners to identify locations for energy resource projects, then submit proposals to Hawaiian Electric in response to the RFP. It is important to understand that for projects to be interconnected with the Hawaiian Electric grid, they can only be sited in areas that have transmission infrastructure with adequate capacity; furthermore, projects are typically sited in close proximity to existing transmission infrastructure to minimize the need for extensive transmission lines.

To better understand the potential for future development of grid-scale renewable resources and to plan for the transmission infrastructure needed to support these resources, Hawaiian Electric conducted a Renewable Energy Zones analysis, which is an industry-standard approach to identify areas where there may be opportunity to site potential renewable resources. In this case, the analysis evaluated the



potential for development of solar or land-based and offshore wind energy resources, as these are currently the most affordable and feasible resources for which data are currently available; however, the analysis does not preclude the integration of other types of renewable resources as they become more readily available in the future. To help address known conflicts, areas with certain characteristics or land uses were excluded from the analysis including tsunami inundation and flood hazard zones, productive agricultural lands,¹ urban zones,

conservation lands, and areas with slopes greater than 30 percent, among others. The results of the analysis identify areas of technical potential (i.e., areas that may be suitable for renewable energy generation projects); these areas are geographically delineated into specific zones based on potential interconnection points with the existing electrical grid. The preliminary results of the Renewable Energy Zones analysis were shared in the presentation and are available online at www.hawaiipowered.com/oahu. However, the results are entirely based on technical data and do not reflect community priorities. As such, Hawaiian Electric is seeking community input regarding suitability of areas within the Renewable Energy Zones, both in terms of specific locations that may be desirable for development of renewable energy resources as well as those that are not preferred. There are multiple options for providing input including in-person and virtual tools offered during the Renewable and Resilient Energy Workshops as well as online at www.hawaiipowered.com/oahu; the online map includes the ability to drop a pin and add comments identifying those places that may be suitable as well as areas that are undesirable for development of renewable energy projects. The input gathered through this process will be used to refine the Renewable Energy Zones analysis, which will be used to guide planning efforts for transmission infrastructure needed to support future renewable resource development, as well as to inform developers regarding potential site suitability for specific renewable energy projects through the RFP process.

¹ Identification of productive agricultural lands was based on the University of Hawai'i's Land Study Bureau (LSB) soil classification system, which rates the productivity of soils throughout the state based on characteristics including texture, slope, salinity, erodibility, and rainfall, and designates areas in categories ranging from A to E (with Class A representing the most productive soils and Class E representing the least productive soils). The analysis excludes all areas with LSB Class A soils and 90 percent of areas with Class B and C soils.

Opportunities for Community Input

Kurt outlined the various options for providing input during the workshops, as listed below. He stated that all comments would be documented in a summary report.

- Verbal comments by participants attending in person and online (via the Zoom hand-raising function)
- Written comments on comment forms (for in-person participants) or via the Zoom chat function (for online participants)
- Menti (online service accessed via personal computer or mobile device, which aggregates and allows meeting participants to see all comments)

He also explained that the following tools are and will remain available, allowing the community adequate time to review and provide input following the workshops. Recordings of the workshops by 'Ōlelo Community Media will also be available on Hawaiian Electric's website.

- Website for hybrid microgrid mapping project (www.hawaiipowered.com/etipp)
- Website for Renewable Energy Zones analysis (www.hawaiipowered.com/oahu)
- Workshop Recordings (<https://www.hawaiielectric.com/clean-energy-hawaii/community-meetings>)

In addition to the tools outlined above, comments may also be submitted directly to Hawaiian Electric via email (igp@hawaiielectric.com).

COMMUNITY FEEDBACK

KO'OLAULOA MOKU (WAIMEA – KA'A'AWA)

OCTOBER 24, 2022

Introduction

The first of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the Ko'olauloa moku of O'ahu, which spans from Waimea to Ka'a'awa. The workshop was held on October 24, 2022 at Kahuku Elementary School. There were approximately 13 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

At the request of the community, a follow-up discussion was held on December 1, 2022 at Hau'ula Community Center. The follow-up discussion included approximately 22 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

Based on the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting hybrid microgrids in Ko'olauloa, including other criteria that should be included in the analysis as well as specific facilities that should be considered because they are important to the community. He highlighted the work that the Ko'olauloa community has done relative to emergency planning and preparedness, emphasizing that Hawaiian Electric wants to learn from these efforts. He explained that Alani would be facilitating the discussion and reminded participants of the various ways that they can ask questions and provide input. Alani stressed that the purpose of the workshop is to gather the community's input to ensure the analysis is aligned with the community's priorities. The questions and input provided by workshop participants is summarized below.



- A workshop participant explained that each community within the Ko'olauloa moku is quite different. For example, she stated that she is from Hau'ula which differs from Kahuku in terms of demographics, community feelings and interests, as well as the physical terrain. She noted that there were no residents of Kahuku in attendance, but that their input should also be obtained. Hau'ula is very close to both the ocean and mountains, without much space between, which means that a lot of the community is within the tsunami inundation zone. The community is accustomed to heading mauka out of the inundation zone during emergency events. There is also a lot of concern about shoreline erosion, which is resulting in loss of beaches, vegetation and eventually homes. Hau'ula residents have been focused on emergency preparedness for a long time, as this community experiences a lot of power outages. The cause of the outages is not always known and the community is often uncertain of how long the outages will last. These types of uncertainties, whether

associated with road closures or power outages, takes a toll on the community. Given these concerns, Hui o Hau'ula has been planning a resilience hub for the larger Ko'olauloa community. It is an ongoing effort, but there is a strong desire for the work to be completed. Similar to Hawaiian Electric, they also have a technical assistance grant from ETIPP and have been receiving technical assistance regarding microgrids. She expressed support for microgrids throughout the Ko'olauloa moku and stressed the importance of working together to determine where they should be located. Microgrids would help to maintain energy during emergency situations, which would allow the community to feel more secure. She expressed appreciation for Hawaiian Electric taking time to work through the information with the community and requested more information about the microgrid maps.

- Another workshop participant reiterated that the various communities within Ko'olauloa are slightly different. In general, everyone in Ko'olauloa knows to head mauka during emergency events, although specific gathering locations and individual plans have been refined over time. The community has gotten better about preparing with the proper equipment (batteries, coolers, etc.), but access to power is critical. The other key issue in Ko'olauloa is road access; currently the most vulnerable location is near the school in Ka'a'awa. The ocean comes right up to the road in this area, and will be over the road within the next one to two years. He also noted another location with a similar issue at Kukuna Road near Kualoa. He stated that he does not know how the State of Hawai'i Department of Transportation (DOT) is planning to address this issue, but noted that Hawaiian Electric's lines run along the road. He emphasized that all of the partners need to be thinking about how to address these issues now. Residents are aware and are alarmed, but nobody is addressing the issues. He expressed the desire for Hawaiian Electric, DOT, and other partners to come together and work with the community to solve problems, and acknowledged Hawaiian Electric's efforts. Alani noted that Hawaiian Electric can help to share these messages with other agencies and organizations. Kurt explained that while Hawaiian Electric is focused on energy, there is a lot of other work occurring in parallel. Hawaiian Electric is directly coordinating with other agencies and organizations, including the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency, Centers for Resilient Neighborhoods (CERENE), and Hawai'i Emergency Management Agency (HiEMA); the goal is to elevate concerns, connect the dots, and bring partners together.
- It was stated that critical infrastructure in this area includes the fire station, Kahuku hospital, internet service, and stores. As such, the critical infrastructure is limited but it is important that each community in Ko'olauloa has a microgrid. In terms of siting the microgrids, they should be in central locations where the community typically gathers in the event of an emergency such as a tsunami.
- It was emphasized that although there is limited infrastructure in Ko'olauloa, those few facilities are very important to the community. In addition to the hospital in Kahuku, there is also an Emergency Medical Services (EMS) station and new fire station in Hau'ula. One concern is that the police and fire personnel have not been part of the local emergency planning efforts. The community has an emergency response team that has been actively planning and training for over ten years. In addition to having an identified tsunami evacuation site, they are also working to develop a resilience hub.

However, they have not been successful in their efforts to coordinate with police and fire personnel; it was speculated that the local police and fire crews have been instructed not to talk with the community emergency response team. The community thinks this coordination is critical, because in the event of an emergency, they will need to be their own boots on the ground. Ko'olauloa is far removed from Honolulu and emergency response agencies will likely be overwhelmed, such that the community anticipates needing to be self-sufficient for 30 days or more. In this type of situation, it will take everyone working together; with coordination, the local emergency response team can help support police and fire crews (and vice versa). Alani noted that Hawaiian Electric can help deliver this message to the relevant agencies.

- A workshop participant reinforced the need for microgrids in Ko'olauloa, specifically as part of community resilience hubs; she stated that these planning efforts should be coordinated. She explained that the resilience hub being planned by Hui o Hau'ula will be located on a hillside at an elevation of approximately 60-90 feet (outside of the tsunami and flood inundation zone). Hui o Hau'ula is working with medical partners and plan to include a medical clinic, dialysis capabilities, and other similar services as part of the resilience hub. She requested that the Hau'ula resilience hub and any other similar facilities planned in Ko'olauloa be specifically considered in Hawaiian Electric's microgrid planning efforts. Other facilities that should be included are the hospital and fire stations. She also noted that without power, there is limited access to fresh water; it is critical that microgrids also help to maintain access to water.
- When asked about specific locations where the community gathers during emergency events, one of the workshop participants explained that people go to places located in mauka areas as lowland areas are not likely to be accessible. Specific locations include the Mormon Church in Hau'ula and the area around the dam in Kahana, which is a big open space where families from Ka'a'awa and Punalu'u gather to barbeque/picnic. He stated that others in the community have their own places and things that they do during emergencies, and it is important that there is help for people during the emergency event as well as afterwards during the transition and recovery effort.
- Kurt explained that microgrids require local energy resources to provide power during emergency events (e.g., solar photovoltaics and battery storage, mobile generators, etc.) and asked about the community's priorities for powering microgrids. In response, one of the workshop participants stated that in the event of an emergency involving a major grid outage (such as in Puerto Rico), the community doesn't necessarily care about the source of the power but rather with restoring electricity as quickly as possible. There may be an increased focus on renewable or more efficient energy source moving forward, but during an emergency, people want any form of power.
- As part of planning for the resilience hub, Hui o Hau'ula is considering solar photovoltaics as well as other renewable energy technologies including wind turbines, geothermal, biomass, and possibly hydrogen. They are currently reviewing various opportunities as part of their ETIPP grant. Based on available information, biomass appears to be a promising concept. The particular strategy being considered produces no emissions and is able to use greenwaste (which is abundant in Ko'olauloa).

In addition to the comments discussed during the workshop, additional comments were received via Menti and in writing. Specifically, in response to the prompting question posed via Menti – “Is the proposed criteria aligned with the community’s resilience priorities (if not, what’s missing?)” – the only comment received stated “yes.” A copy of the Menti response is contained in Attachment D.

Questions and comments that were received in writing on the response cards regarding the microgrid mapping and related resilience issues are listed below. Copies of the written response cards are contained in Attachment E.

- What kind of new poles for our erosive highway?
- Punalu‘u contains a large amount of agricultural land. Can those areas still qualify for a microgrid?
- Cost is a big issue for community. How is a microgrid going to impact electric bills?
- Do you start where the hub will be and work out or do you have another method of making the grid?
- We’ve been asking to have mango tree branches now hanging over our lines cut for months and nothing has been done. It was stressful to think about it during hurricane season.

Comments provided by participants at the follow-up discussion held on December 1, 2022 at Hau‘ula Community Center are listed below:

- Impressed with Babcock Florida, they have a resilient community that was not affected during Hurricane Ian. <https://babcockranch.com/>. Built to highest standards in FL. No houses were damaged, and they had a huge microgrid in place.
- Oakland, CA are pushing their EVs to also charge back the grid (learned through Zoom mtg)
- BYU has done a good job with their solar layout
- We need more than just solar, we need backup.
- RE: Power frequent power outages - The community feels ignored. The community doesn’t have much faith. Community has given up. We have an outage at least 1x/wk.

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the renewable energy zones analysis (as summarized previously in this report), Alani reiterated that Hawaiian Electric is looking for input regarding siting of renewable energy resource development. He acknowledged the previous issues related to siting of wind turbines in Kahuku and emphasized that Hawaiian Electric is trying to improve the renewable energy planning process to avoid similar issues in the future. The questions and input provided by workshop participants is summarized below.

- In response to the previous comment that Hui o Hau‘ula is considering wind turbines as part of their resilience hub, Alani noted that wind turbines are controversial and asked if this is something that is being discussed with the community. One of the workshop participants stated that he doesn’t think there is anything wrong with turbines, but they must be properly sited. In the case of Kahuku, the

turbines were placed too close to the community. Based on research of other wind energy projects, it is understood that wind turbines in Germany are located at least one mile from the nearest residence or farm. We should be learning from others to incorporate the best technology and information regarding health impacts. The people who sited the turbines so close to the school are incompetent, just like those involved in the rail project. He stated that he would like to see wind turbines at the State Capital, Department of Health, and City Hall; they should have to live with the wind turbines as that is what the Kahuku community has to live with 24/7. He noted that he was one of the first people to be arrested when the wind turbines were brought to Kahuku; although he lives in Kahana, this is part of all of our communities. If people aren't willing to put the wind turbines next to a high school in Hawai'i Kai, they shouldn't put them in Kahuku.

Kurt acknowledged these concerns and the need for improvements in the renewable energy development process; previous efforts did not adequately include the community and there have been many lessons learned. He explained that these workshops are part of an effort to improve the renewable energy development process, particularly engaging the community earlier in the process. Hawaiian Electric is seeking input from the community to help inform future Requests For Proposals (RFPs), which is the process by which the grid-scale renewable energy projects are identified and selected for development. He stated that Hawaiian Electric has learned a lot from talking to the community, including Hui o Hau'ula and Kukea Kahuku, and recognizes the need for improvements. He explained that significant improvements have resulted from recent efforts by the West O'ahu community based on their concerns with renewable energy development. In response to an RFP for a shared solar program, community leaders came together and aligned their interests, then submitted a letter to the Public Utilities Commission (PUC) requesting changes to the RFP process. The PUC granted most of the community's requests, which will be incorporated into all RFPs moving forward. Kurt emphasized that this is the type of work that Hawaiian Electric hopes to facilitate with other communities around the island.

- A workshop participant stated that there has always been a lot of wind in the back of the valleys. He emphasized that there is wind in the valleys on both sides of the island but acknowledged that it will be difficult to get transmission lines across the mountains. However, he stated that he thinks wind turbines could be sited in the middle between the mountains, as there are no residents in this area and the turbines could serve the populations on either side. He acknowledged that investors might not like this arrangement, but he thinks this is the best long-term solution for wind and even solar energy projects. He also noted that all houses should be required to have solar photovoltaic systems, with lease programs or other arrangements that are user-friendly and affordable enough to allow for system upgrades.
- A question was asked about the timing of the peak power demand on O'ahu. Colton explained that the greatest demand for electricity on a daily basis is typically around 7:00pm. Although fairly consistent throughout the year, usage typically peaks in September or October (as this is when it starts getting dark earlier, but is still fairly warm so air conditioning units are still being used). The peak power demand on O'ahu (around 7:00pm in the September to October timeframe) is

approximately 1,200 megawatts, which far exceeds that of the neighbor islands but is much lower than other states.

- A workshop participant emphasized that there will continue to be development which will occupy a lot of the open areas shown on the map. As such, renewable energy projects should be sited as far back as possible from these areas, in the middle area between the mountains, away from schools and other development.
- A workshop participant stated that she recently attended a presentation hosted by the Board of Water Supply about the Canary Islands, an archipelago similar to Hawai'i. She stated that there is an impressive amount of work being done to research and collect data on a wide variety of issues related to water supply as well as renewable energy. She encouraged others to learn more about this work as the Canary Islands are ahead of many other locations and are willing to share information.
- A workshop participant noted that she previously lived on Pacific Heights and that this area was very windy. She stated that she isn't sure how to best capture that wind but emphasized that it funnels through the valleys. She agreed with the approach of talking with communities to figure out how to best approach renewable energy solutions and stressed the need to amplify the voice of communities that feel invisible. She stated that she hopes community members will join these conversations, as it is important to capture their input. She also discussed the value of community centers, such as the community center in Hau'ula which serves everyone in Ko'olauloa. She explained that community centers engage people, day and night; it is a comfortable place where people feel safe and can spend time with their friends. She stated that she hopes Hawaiian Electric will continue trying to engage with the community as it is an important step and she believes that people want to give input.

Alani noted that although it may not be Hawaiian Electric's kuleana to build a community center, it is important to consider the human element that makes community centers so valuable. If people don't have places to come together and talk about issues, such as these discussions about microgrids and renewable energy, then they won't know what is going on or the appropriate steps to take. The workshop participant explained that the community center in Hau'ula has been there for a long time. It was mothballed but has since been turned into a great facility; unfortunately, it is located in the flood inundation and tsunami evacuation zone. As soon as the resilience hub is built, everything from the community center will be relocated to this location as it will be in a mauka location. She noted that the Federal Emergency Management Agency (FEMA) helps to replace buildings that are located in the flood inundation and tsunami evacuation zone, so Hui o Hau'ula is trying to get their help. She stated that similar efforts are needed to relocate these types of facilities around the island. She also noted the importance of getting input from the community so that the culture can be incorporated and make people feel at home. People who are engaged and spend time together, build social capital, which is the most important thing in the time of emergencies.

In addition to the questions and comments discussed during the workshop, additional questions and comments were received in writing, as listed below. Copies of the written response cards are contained in Attachment E.

- No windmills should be as close to homes, schools and farms as the monster turbines in Kahuku are.
- Kurt was a very informed and informing speaker. Excellent, thank you. Learned a lot. Will be more informed in future to have more meaningful input. Appreciate early community involvement.
- Are horizontal wind turbines less expensive than vertical? How well do they tolerate salt air? No solar farms on agricultural land! No vertical wind turbines!
- No vertical wind turbines! Horizontal turbines are okay.
- Good to know what's going on and all of the changes that affect our electric utilities and how it trickles down to us.

Comments provided by participants at the follow-up discussion held on December 1, 2022 at Hau'ula Community Center are listed below:

- Supportive of horizontal turbines
- Completely against wind turbines

Shellee Kimura, Chief Executive Officer of Hawaiian Electric, provided closing remarks. She expressed her appreciation for community members joining the workshop and engaging with Hawaiian Electric. She emphasized the importance of the community's perspective and encouraged others to participate in the future. She noted that Hawaiian Electric understands that these are complicated topics and it is difficult for many people to engage; however, community knowledge and experience is critical to developing real solutions for Hawai'i. Recognizing that the work being discussed may not be built for ten or more years, she stressed that the process is starting now; input obtained through these types of discussions result in decisions that get baked into the plans, which ultimately result in infrastructure being built in people's communities. Therefore, it is important that the community is part of the conversation as the plans are developed. The goal is to create a system that serves the community in alignment with community values. She explained that we all have important work to do to achieve 100 percent renewable energy while ensuring affordability and equitability, both in terms of economics as well as geography. She acknowledged that transforming the entire energy ecosystem is challenging, underscoring the importance of working with the community. Because energy intersects with so many aspects of peoples' lives, changes to the energy ecosystem can both positively and negatively affect the community. The goal is to work with the community to design the system in a way that results in the most positive impacts as possible. She reiterated the importance of the community's input and thanked the participants for their time and interest in the process.

Kurt also acknowledged CERENE and explained that they are engaging with the community at the grassroots level to develop resilience hubs, such as the work being done by Hui o Hau'ula. Miku Lenentine explained that CERENE is based out of Kapi'olani Community College and works with both the

University of Hawai'i Department of Urban and Regional Planning and the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency. She stated that CERENE is working with neighborhood groups and community centers to identify potential locations for resilience hubs across the island. She emphasized the comments shared by one of the community participants about the importance of community centers and the human element of resilience during emergencies. She stated that CERENE would be holding a meeting in Ko'olauloa on November 16, 2022 at which time they would share more details and have follow-up discussions regarding resilience hubs.

COMMUNITY FEEDBACK

WAI'ANAE MOKU (NĀNĀKULI – KEAWA'ULA)
OCTOBER 26, 2022

Introduction

The second of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the Wai'anae moku of O'ahu, which spans from Nānākuli to Keawa'ula. The workshop was held on October 26, 2022 at Agnes Kalaniho'okahā Community Learning Center. There were approximately 19 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

Based on the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting hybrid microgrids in the Wai'anae moku, including other criteria that should be included in the analysis as well as specific facilities that should be considered because they are important to the community.

He explained that Alani would be facilitating the discussion and reminded participants of the various ways that they can ask questions and provide input. Alani acknowledged the past history of environmental justice and inequity issues experienced along the Wai'anae coast and stressed the importance of community input to the energy planning process. The questions and input provided by workshop participants is summarized below.

- One of the workshop participants expressed frustration that Hawaiian Electric is addressing the three communities that are currently hosting the majority of the renewable energy projects on O'ahu. She stated that as a member of a community that has been heavily affected, she would rather point to other communities than to identify locations in her community. She emphasized the need to address the injustices associated with all of the existing facilities hosted on the Wai'anae coast and stated that she doesn't want to offer up places for more facilities that the community doesn't want. She stated that the community understands the need for renewable energy but thinks that the rest of the island should share the burden of hosting these facilities.

Alani clarified that workshop are being held to solicit input from each of the six moku around the entire island of O'ahu; he emphasized that the feedback received from each workshop would be documented and made available for all stakeholders to review. He also noted that the intent of the microgrids is to provide a benefit to the community by maintaining power at critical facilities during emergency conditions. For example, he suggested that the Wai'anae Coast Comprehensive Health Center is an important facility that may benefit from a microgrid (but noted that specific facilities should be identified by the local community). The participant acknowledged the potential benefit of microgrids to the community, but emphasized that the rest of the island needs to share the burden – if not in terms of renewable energy projects then in other ways that can improve resilience (such as access roads). If other communities don't have adequate space or the land is too expensive to site renewable energy facilities, they can instead help with funding to improve resilience in areas that are hosting those facilities. She emphasized that social justice crosses a multitude of community lifelines and the discussion shouldn't be limited to only energy systems; other issues that should be addressed include transportation systems, food sustainability, and support for the few remaining

farms. In summary, she stated that she appreciates the information being requested but instead of identifying where projects should go, she would like to focus on support for Wai'anae.

- Another workshop participant expressed concern about the resilience of existing infrastructure in the event of a major hurricane. She stated that all infrastructure, including Hawaiian Electric's transmission system along Farrington Highway, needs to be bolstered. Several poles in Nānākuli have been replaced, but there are other locations along the Wai'anae coast where the system needs to be strengthened. There is no value in establishing microgrids if there isn't a way to transmit power to them. As such, there needs to be a focus on improving the infrastructure to ensure that power can be delivered to microgrids, wherever they might be. She noted that there were previously discussions about undergrounding the transmission lines along Farrington Highway and acknowledged the concerns with cost, degree of disruption, as well as sea level rise. She stressed the need for action to be taken before another disaster strikes, noting that too often progress is not made due to cost or lack of consensus. Action is needed now to provide adequate infrastructure to support microgrids. In terms of specific facilities, she agreed with the need for a microgrid that serves Wai'anae Coast Comprehensive Health Center as well as the dialysis center in Wai'anae.

Colton acknowledged the comments regarding the need for further hardening of the infrastructure. He noted that Hawaiian Electric recently filed an application with the Public Utilities Commission (PUC) for this very purpose. He emphasized that there is no single solution that will address all issues. Although microgrids are the focus of the current discussion, they are only one of piece of the larger puzzle that Hawaiian Electric is trying to solve. Kurt added that this is the exact type of feedback that Hawaiian Electric is seeking. He reiterated that microgrid analysis is just one part of the overall solution, and agreed that other efforts such as hardening existing infrastructure also needs to happen in parallel. He explained that hybrid microgrids are a new concept and this is one of the first times that Hawaiian Electric is discussing this topic with the community. He emphasized that the effort is still in the early stages and the information is incomplete as community input is still needed.

- Alani highlighted one of the comments received via Menti, which states "the concept is fantastic and relevant to the current situation of our energy crisis, but one criteria that I wonder is if cultural sites were included in consideration that may lay in scientifically ideal locations for renewable energy." Kurt responded that the analysis to date has not included this type of information, but that it will be critical to the process moving forward. Specifically, Hawaiian Electric is looking for site-specific information from the community that neither Hawaiian Electric nor potential developers may be aware of. Alani noted that any project that requires PUC approval will need to undergo some level of review by the State Historic Preservation Division (SHPD). However, he provided an example illustrating that SHPD is not always aware of all cultural resource issues that may be important to the community, and thus it is critical to obtain the community's cultural knowledge.
- Kurt also acknowledged another comment received via Menti regarding cost: "Who will pay to develop or construct a microgrid." He explained that the microgrid mapping is part of a larger effort associated with a PUC docket for a microgrid service tariff. As part of this effort, all of the microgrid

mapping information including community feedback will be used to develop a Request for Proposal (RFP) for developers to submit bids for construction of microgrids on O'ahu. Ken clarified that the genesis of the microgrid mapping effort was to support a program in which customers (or a group of customers) could self-fund the development of a microgrid. The data that is generated through the mapping process can also be used to identify opportunities for Hawaiian Electric to improve reliability. For example, Hawaiian Electric could pursue a microgrid as an alternative to building a new transmission line to meet reliability metrics. As such, there are different funding mechanisms that can be used for development of microgrids.

- Alani asked if there are specific locations, particularly in mauka areas, where the community gathers during emergency events. A workshop participant noted that an important mauka area especially for the Nānākuli and Mā'ili community is the Lualualei Naval Magazine as it is relatively accessible and is one of the higher spots in the region.
- A workshop participant asked if there is a specific size for microgrids. For example, if a microgrid were developed for the Wai'anae Coast Comprehensive Health Center, would surrounding areas also be included in the microgrid? Ken responded that under the hybrid microgrid program, the maximum size would be approximately 3 megawatts (which roughly equates to the capacity of a distribution feeder line); microgrids can also be smaller in size. He explained that the size of a microgrid is dependent on the circuit capacity and architecture, as well as the various criteria considered in the mapping analysis. Alani asked Ken to provide an example of an area that could be served by a 3-megawatt microgrid. Ken responded that the circuit that feeds the area between the elementary school in Wai'anae up to Ka'ena Point is generally about the maximum size of a hybrid microgrid. Another example is illustrated on the map contained in the technical presentation showing two potential hybrid microgrids in Hau'ula, both of which include various homes and businesses. Alani suggested that Hawaiian Electric could compile maps showing potential microgrid locations in the Wai'anae moku.
- A workshop participant stated that it is possible to identify locations that serve as community gathering areas, but it is also important to have trained community volunteers to receive people that would be coming to these locations. She noted that she lives right down the street from Kaupuni Park; a lot of community members come to this location but it is not always managed in an orderly manner (e.g., vehicle parking, tent placement, etc.). If sites are identified on a map as gathering locations, there needs to be some sort of organization or command so that they can temporarily welcome as many people as possible. Alani noted that Hawaiian Electric directly coordinates with disaster management agencies and other similar groups, and emphasized that this should be part of the discussion moving forward.

Kurt explained that because microgrids can be isolated from the grid, they require a backup power source. Therefore, he asked the community to think about what types of technologies should be considered in powering microgrids in the Wai'anae moku. He explained that the community can provide feedback on this question moving forward.

In addition to the comments that were raised during the workshop, additional questions and comments were received via Menti. These comments are summarized below; copies of the responses are contained in Attachment D.

The following questions and comments were received via Menti in response to the question: *Is the proposed criteria aligned with the community's resilience priorities (if not, what's missing)?*

- You have done a good job but it needs to remain open for unforeseen scenarios. Also, the Veterans centers need to be included.
- In looking at how and where do we keep the Wai'anae Moku powered during outages be of man or natural disasters, our distribution points/places - which are still being identified, and could be "Resilience Hubs."
- Which is the most ideal / powerful renewable source of energy you guys are looking at currently that still "works" for the community? Or just the source you have researched the most that works for Hawai'i?
- The concept is fantastic and relevant to the current situation of our energy crisis, but one criteria that I wonder is if cultural sites were included in consideration that may lay in scientifically ideal locations for renewable energy.
- Identified mauka "safe havens" locations in each ahupua'a
- What's smallest grid possible? Does it make sense functionally, operationally and financially to try to create small compact ones - to address transmission vulnerability?
- How much of a financial impact would it be to create microgrids in Wai'anae? Can we afford it? Who pays for it?
- Areas directly around our schools that are emergency and/or hurricane, tsunami shelters
- 'Ae, HECO must consider both oral history not documented by cultural organizations as well as documented written history cultural sites. Many 'ohana have stories and significant places not made public or stories passed down that makes sites kapu.
- Influence the military facilities to become sites
- Military sites (2)

The following questions and comments were received via Menti in response to the question: *What other community facilities are missing or should be included in the analysis?*

- Kaupuni Park in Waianae Valley Homestead
- Community Learning Center in Mā'ili
- Military sites indeed

The following questions and comments were received via Menti in response to the question: *How should these microgrids be powered?*

- Firm power sources vs intermittent. Things that don't add environmental disposal hazards.
- Firm power not intermittent. Environmentally safe resources.

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the Renewable Energy Zones analysis (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting of renewable energy resource development. He acknowledged there are improvements that need to be made to the planning process and this is part of an effort to better include community in that process. The questions and input provided by workshop participants is summarized below.

- A workshop participant referenced the 138kV substations shown on the Renewable Energy Zones maps and noted that these are locations where electrical voltage is increased to allow for transmission across further distances. He asked whether the electricity used for the microgrids could be transmitted at lower voltages, such that it would not need to be increased to the 138kV level. In this case, microgrids could be used to provide electricity for the local community (i.e. more distributed rather than centralized). Colton confirmed that this is the approach being considered for microgrids. Given the anticipated size (up to approximately 3 megawatts), the microgrids would be localized and interconnected at the distribution level (via lower voltage lines). In contrast, the Renewable Energy Zones analysis is looking at opportunities for large-scale renewable energy generation projects that would serve the island-wide grid. As such, the map is intended to show areas with technical resource potential that may be suitable for development. The analysis will help Hawaiian Electric to identify how much renewable energy generation could be developed in any given region to help meet the renewable energy goals for the island. To allow for safe and efficient use of the electricity, these larger-scale projects would need to interconnect at the 138kV level.
- The participant also noted that the analysis is focused on wind and solar photovoltaic technology and asked if geothermal is also being considered. Ken responded that although geothermal power may be possible, there currently is no data available specific to geothermal potential. He explained that the Renewable Energy Zones analysis will help to determine how much energy Hawaiian Electric should plan for in different regions around O'ahu so they can develop the necessary transmission



infrastructure to interconnect future projects. Colton added that there may be potential for geothermal energy, but there is no data regarding specific locations or quantities for the island of O'ahu. Currently, the only data available relates to wind and solar potential; if and when data regarding geothermal (or other types of renewable energy resources) become available, these can be included in the analysis. Katy noted that the National Renewable Energy Laboratory (NREL) is currently working to incorporate geothermal into their renewable energy potential tool and hopes this will be available for widespread use by 2024. She noted that there are some datasets for other renewable energy technologies such as hydrokinetic marine. The workshop participant asked if there is data available for hydrogen technology; Katy responded that NREL is also working on this information.

- A workshop participant referenced the Renewable Energy Zones map and emphasized that it does not show any resource potential for areas such as Honolulu and Pearl Harbor. She asked about the potential for rooftop solar in these areas, including high-rise buildings. Although rooftop solar involves planning in smaller increments, she stated that there is significant potential especially given recent discussions about allowing for solar panels to exceed maximum building height limits. By excluding this information, she stated that a significant amount of resource potential is being ignored. She emphasized that the community's desire to maximize potential on existing structures rather than focusing on raw land was previously raised by the West O'ahu/Kalaehoa Clean Energy 'Ohana, and she is disappointed that this input is not reflected in the Renewable Energy Zones analysis. Colton acknowledged the previous input provided by the West O'ahu/Kalaehoa Clean Energy 'Ohana; he explained that this is being addressed as part of a separate effort and apologized that it is not reflected on the Renewable Energy Zones maps. He committed to sharing this information the next time Hawaiian Electric meets with the community. He explained that the Renewable Energy Zones analysis excludes certain areas (for example, high quality agricultural lands, urban areas, conservation lands, etc.) as a way to limit the potential for conflicting land uses; this is the reason why there is no potential shown for certain parts of the island. Katy also noted that the analysis is based on a 90-meter scale. Another workshop participant emphasized that even if the analysis indicates there is no potential for large-scale projects, it should still indicate that there is potential for rooftop solar; this is critical to help address equity across geographic regions and to encourage rooftop solar and other small-scale projects.
- A workshop participant shared information regarding the Energize Wai'anae program, which is part of Solarize 808. This program will be rolled out in the Wai'anae moku starting next month.
- Another workshop participant explained that they are part of the Renew, Rebuild Hawai'i committee. On November 17, the committee is hosting a webinar regarding geothermal energy, including representatives from Puna Geothermal, the University of Hawai'i, and other similar entities. He stated that this may be a good opportunity to get information and other resources (and can be shared with those who are not able to attend). He noted they recently hosted a webinar regarding ocean thermal conversion technology (OTEC), which is another alternative form of firm power.

- A workshop participant noted that the presentation showed that O'ahu currently has 1,614 megawatts of firm capacity and 126 megawatts of renewable firm capacity. She indicated that these resources together total approximately 1,700 megawatts and asked if this is the target capacity once other renewable energy resources are brought online. Marc indicated that as other renewable energy projects are integrated into the system, especially projects that include battery storage, Hawaiian Electric will start retiring existing fossil fuel generation units which will decrease the total firm capacity. For example, the recent retirement of the AES coal plant reduced firm capacity by about 180 megawatts. The workshop participant asked what will happen in 20+ years when the system is operating entirely on renewable energy resources, but existing solar panels reach the end of their useful life. Colton explained that when a large fossil fuel generator such as the AES coal plant is taken offline, it does not necessarily need to be replaced with exactly the same amount of generation or energy storage. However, it is critical that the replacement energy is available on a consistent basis to ensure reliability; various ways of addressing this issue include using a mix of different technologies, as well as staggering the onboarding (and associated lifespans) of the various generation sources.
- A workshop participant referenced the increase in electrical prices when the AES coal plant was taken offline and asked how the transition to 100 percent renewable energy will affect prices. Colton explained that although the coal plant produced extremely high levels of greenhouse gas emissions, it also generated relatively cheap electricity. Therefore, increased price is one of the tradeoffs of no longer buying power from the coal plant as part of the effort to comply with state laws and policies. He explained that there have also been unforeseen events (including supply chain issues, economic downturn, and the Russian invasion of Ukraine) that have driven oil prices significantly higher than when the decision was made to retire the AES coal plant. However, he stressed that the goal is to select the right mix of renewable energy technologies to be brought online at a deliberate and efficient pace. Although it may not be possible to bring prices below their previous levels, they will be stabilized such that ratepayers can be protected from external events such as a destabilized oil market.
- A workshop participant asked about measures to protect the electrical grid from terrorist or cyberattacks and whether spare parts are maintained to facilitate system recovery. Colton explained that Hawaiian Electric has an entire team that is dedicated to protecting against terrorist and cyberattacks. He emphasized that this effort is tightly coordinated with multiple agencies at the federal and state level. He explained that although Hawaiian Electric is a small utility, the risk exposure is high because Hawaiian Electric is the only entity that provides power for the entire U.S. Indo-Pacific Command (PACOM); all other commands on the mainland are served by multiple utilities. He confirmed that Hawaiian Electric also maintains various spare parts for its system, including those needed to respond to attacks as well as hurricanes and other types of natural hazards.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti and in writing. These comments are summarized below; copies of the responses are contained in Attachments D and E (respectively).

The following questions and comments were received via Menti in response to the question: *What are the most important factors to consider for the siting of renewable energy on O'ahu?*

- Diversifying the kinds of renewable energy and not just place such a huge focus on solar
- Finding technology that takes up less land space and has a smaller footprint
- Fair, not necessarily just equal, and pono distribution across ALL communities
- Designing tech and systems for high rises and town areas
- Concentration and permeation of projects within a defined geographic area (identify threshold to manage number of projects, whether large or small)
- Physical security, cyber security, and accessibility for repairs such as large transformers.

The following questions and comments were received via the written comment cards:

- Are the areas of highest potential to host large renewable development be given highest priority usage of that resource? Or will it be sent to the higher usage sites? Example: Will Wai'anae and North Shore side who have high land potential be given higher priority usage over Waikīkī (who is a high energy user)?
- Do you see your prime prospective locations for large renewable development and microgrids competing with sustainable agriculture plots and prime farming locations? Will you be willing to relinquish prime energy development locations and allow diversified sustainable agriculture to take the spot?
- I appreciate that the meetings are hybrid, that makes it more accessible.

COMMUNITY FEEDBACK

KONA MOKU (MOANALUA – EAST HONOLULU)

NOVEMBER 1, 2022

Introduction

The third of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the Kona moku of O‘ahu, which spans from Moanalua to East Honolulu. The workshop was held on November 1, 2022 at Kapi‘olani Community College. There were approximately 36 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

Based on the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting hybrid microgrids, including other criteria that should be included in the analysis as well as specific facilities that should be considered because they are important to the community. He explained that Alani would be facilitating the discussion and reminded participants of the various ways that they can ask questions and provide input. Alani stressed the important of community-based knowledge and stated that the purpose of the workshop is to gather feedback to ensure the analysis is aligned with the community’s priorities. The questions and input provided by workshop participants is summarized below.

- A workshop participant stated that he recently completed a survey from the University of Hawai‘i Department of Urban and Regional Planning; a key question was about where residents would like to get energy for their specific community. Similarly, he emphasized that the Center for Resilient Neighborhoods has a similar place-based focus on issues such as energy, water, and other resources. The survey included questions similar to those being posed by Hawaiian Electric and led him to think about health-related facilities. He explained that he lives in an area dependent on Kalaniana‘ole and Kamehameha highways for access; if those roads are inaccessible, there would be limited options for health care services. As such, he thinks it would be valuable for a microgrid to include the Straub urgent care facility (located in the Hawai‘i Kai shopping center). He emphasized that local facilities such as urgent care centers may have to handle any medical issues until roads can be safely opened.
- Another workshop participant referenced a City and County of Honolulu initiative to convert their entire fleet to electric vehicles. She stated that based on this initiative, theoretically all emergency response vehicles will be electric vehicles. She asked if the analysis has considered baseyards or other locations where the City and County of Honolulu’s vehicle fleets are charged and stated that these are locations that will require energy. Ken responded that vehicle charging stations were not included in the analysis and stated that this is valuable input.
- A workshop participant asked for further definition of microgrids and how these would benefit the community. Alani offered an example based on his neighborhood, located in Kailua near Castle Hospital. He stated that the hospital is a critical facility as it will provide key medical services during an emergency; other critical facilities in this area include Kailua High School (which can serve as an emergency shelter), Olomana Fire Station, and a Hawaiian Electric substation. All of these facilities are located proximate to one another and are interconnected with the Hawaiian Electric grid. Installation of a microgrid would involve reconfiguration and hardening of the electrical system to allow these

facilities to be islanded (or sectioned off) during an emergency. If the island-wide grid were to lose power, local energy resources (e.g., backup generators located at Castle Hospital) could be used to power the various facilities within the microgrid.

Kurt asked representatives from the Center for Resilient Neighborhoods (CERENE) to also summarize the work being done in the Kona moku. Bob Franco explained that CERENE received an Action 15 grant from the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency,



and is partnering with the University of Hawai'i Department of Urban and Regional Planning to identify resilience hubs in each moku across O'ahu. CERENE thinks of a resilience hub as a structure as well as services that can be provided at that structure. In addition to the types of services that Alani referred to in his example (i.e., medical services, emergency shelter, fire station), other critical services relate to food, water, and communications. CERENE is conducting

community engagement workshops in each moku and preparing similar maps using data from the University of Hawai'i Department of Urban and Regional Planning. He noted that this work is being done with support from Hawaiian Electric, who provided funding for their resilience core leaders, and CERENE is trying to get this to be part of student's learning experience at Kapi'olani Community College. He highlighted the synergies between Hawaiian Electric and CERENE's efforts, emphasizing that the microgrids could provide the energy lifeline for the resilience hubs. He stated that the power for the microgrid might not be located at the resilience hub as it could come from another nearby source, utilizing solar or other generation resources. He emphasized that CERENE has also spent a lot of time focusing on vulnerable populations, including kūpuna. He noted they also recently had a workshop with Pacific Islander pastors to discuss their response to the COVID epidemic.

- A workshop participant asked for clarification regarding whether microgrids are only for emergencies or whether they are also used for day-to-day conditions. Ken responded that the primary objective of a hybrid microgrid is to provide back-up power in the event of an emergency, which is why the focus is on siting them around critical facilities and/or in areas that are prone to outages. The workshop participant stated that it seems important to have microgrids available in rural areas at all times, not just in emergencies. Alani clarified that once installed, a microgrid is available for use at any time. Bob Franco emphasized that it is important to also remember that a long-term purpose is also to decarbonize the energy system.
- An online participant stated that she recently joined the resilience hub workshop at Waikīkī Community Center. She explained that during the resilience hub workshop, they discussed gathering areas that can be used by the community during an emergency; she stated that these gathering areas

should be considered for microgrids. She noted that her group identified Kapi'olani Community College as an ideal gathering area.

Another workshop participant subsequently stated that he works at the Chancellor's Office and wanted to clarify that Kapi'olani Community College is not a designated evacuation center; the nearest evacuation center is Kaimukī Middle School. He also stated that Kapi'olani Community College is working with Kaimukī Middle School to develop a solar energy backup system across the street. He noted that there are several emergency responders and other entities in the immediate area (including the Red Cross, Department of Defense, Hawai'i Emergency Management Agency, Diamond Head State Park, and Department of Accounting and General Services [DAGS]) that can be involved in the discussion of energy needs; he stated that it is important to consider where the emergency responders are located and what type of energy they need.

- An online participant submitted a question via the chat function, asking if there are any plans in place for mobile microgrids to assist emergency response teams or organizations and emergency shelters during natural disasters during times of crisis. Ken responded that there are plans in development that would generally allow this type of response. For example, in the Ko'olaupoko region, Hawaiian Electric worked with the community to conceptually identify areas that could be isolated from the grid in an emergency and could host a mobile generator to provide power to certain critical facilities. He explained that this ability exists, but it takes a lot of planning and engineering to implement. Colton clarified that the generator is the mobile component; the facilities that are part of the microgrid are fixed in place and the electrical components must be modified and hardened to support the microgrid.
- Another online participant asked about the type of power that can be used for a microgrid. Ken responded that hybrid microgrids are designed to aggregate whatever energy generation resources are available for the various customers within the microgrid. As many customers already have rooftop solar and battery storage, this could provide a significant portion of the energy generation for a hybrid microgrid; however, this may be augmented by other types of energy generation resources.
- A workshop participant asked if vacant land is being considered for microgrids. She also asked if microgrids must be configured in a certain way, such as through triangulation. Ken responded that microgrids are generally developed for customers that receive electricity from the utility. Furthermore, a hybrid microgrid would generally include facilities that are served by the same electrical distribution line. To develop a microgrid, isolation points are added to the system to allow for those facilities within the microgrid to be isolated from the grid during an emergency.

The participant asked whether an area with open land could be used to develop facilities to create a hybrid microgrid. Kurt referenced the work that CERENE is doing to identify resilience hubs; these may have their own source of power or may be connected to a microgrid with other critical facilities. Structures that are hardened and can accommodate people as a gathering place can also be considered; however, facilities such as hospitals should be prioritized for their primary purpose.

- Another workshop participant stated he lives in the Makiki neighborhood and during emergency events, most people shelter in place. He stated that he lives in Kalana Hale on Beretania Street; the

surrounding area includes many buildings with a lot of kūpuna (over 60 or 70 years old) as well as a food distribution center. He explained that there is a Foodland that has been vacant for 12-18 months; he is not sure about the commercial viability but stated that it may be appropriate as a community gathering location (without overwhelming other facilities such as medical centers). He also asked about public utility-private partnerships with commercial kitchens or similar sites (such as Kapi'olani Community College). These are facilities where chefs can organize, with logistical support from other organizations that may have excess food, to help feed people; he emphasized that power is critical for these types of services.

Alani asked Hawaiian Electric staff to clarify the process for identifying locations for microgrids. Colton explained that existing information in databases and reports has been used to identify institutional facilities that provide various public functions, such as schools, state buildings, and emergency shelters. He emphasized the need for community-based knowledge such as underutilized facilities that may be modified to provide emergency services; he noted the importance of providing specificity to help inform the microgrid development process. In terms of the process moving forward, Colton explained that Hawaiian Electric has started identifying locations for potential microgrids; for example, a microgrid was developed in Hana several years ago and another microgrid is currently being proposed for the North Kohala district of Hawai'i Island. The intent is to expand the effort from these singular opportunities addressing infrastructural needs to more broadly address community priorities. The process to identify community priorities for microgrids is just starting; it will take several years to sort through, prioritize, and refine the opportunities based on the available data and community feedback. He also stressed that the need to figure out how individual microgrids will be funded. However, he stated that he believes that microgrids will become an inherent part of Hawai'i's energy system in the future as the opportunities are better understood.

- An online participant stated that she is an associate professor at University of Hawai'i Department of Urban and Regional Planning, and is working with CERENE and the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency on resilience hub planning projects. She explained that they conducted a community survey in April and gathered community input regarding frequently used community facilities that could be used as resilience hubs. She stated that it is an ongoing effort but they would be happy to share the findings to date. She explained that their effort includes a similar suitability analysis but because the resilience hubs would be community facilities, there is more focus on factors such as hazard vulnerability, transportation accessibility, social vulnerability, and community support; however, there is overlap and opportunities for collaboration.

She also asked for clarification regarding the microgrid analysis in terms of whether Hawaiian Electric is seeking to identify facilities where microgrid equipment could be sited or facilities that a microgrid could serve; she noted that these could be one in the same or they could be different, depending on the scale. For example, is Hawaiian Electric trying to find sites to put solar panels to serve a microgrid, or the facilities that could be served by those panels? Alani confirmed that the goal is to identify the specific facilities that could be served by a microgrid based on the community's specific priorities and needs. Katy added that it is easier to move around the technology (for example, the customer-sited

energy resources such as solar panels or batteries) than it is to move around essential facilities (for example, a community gathering place).

A workshop participant stated that a relatively new issue that should be considered is ransomware or hijacking facilities and asked how Hawaiian Electric would harden the grid to address those situations. She also asked whether a microgrid would decentralize the grid operationally. Colton explained that hardening serves to make the system more resilient; microgrids are only one component of this effort. Ultimately, for a microgrid to function after a major storm or disaster, all components of that microgrid (including the energy resource generation, as well as all of the wires that connect the energy resource generation to the critical facilities) must be able to withstand the disaster. As such, the electrical wires and lines forming the microgrid need to be hardened. He emphasized that it is also important to harden other lines comprising the rest of the grid to help improve overall reliability, as it isn't possible to build a microgrid for every customer. Regarding cyberattacks, Colton explained that this is an ever-growing challenge that many industries face, not just the energy sector. However, he stated that Hawaiian Electric is particularly at risk because electricity is such an important part of our society; in addition, Hawaiian Electric is the sole utility serving the entire U.S. Indo-Pacific Command (PACOM). As such, he emphasized that Hawaiian Electric spends an enormous amount of their resources and works directly with multiple federal and state agencies to ensure the energy system is resilient and resistance to cyber threats.

With respect to the question about whether microgrids will result in a more distributed electrical system, Colton indicated that it is yet to be determined what the future electric system will look like; however, it is fairly certain that it will be more decentralized and microgrids are needed to make this possible. It is unclear whether the system will be completely decentralized as there are certain aspects of a resilient grid that requires larger, centralized resources.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti and in writing. These comments are summarized below; copies of the responses are contained in Attachments D and E (respectively).

The following questions and comments were received via Menti in response to the question: *What other community facilities are missing or should be included in the analysis?*

- Multi-family homes and large walk-ups with multiple owners that can technically have renewable energy sited and storage but there are implementation barriers to installation.
- Community gardens (2)
- Hawaiian cultural sites
- Homeless shelters and food pantries
- Can you help us understand why microgrids are good for communities? How can this new solution speak to energy justice?
- Large landowners

RESILIENT AND RENEWABLE ENERGY COMMUNITY WORKSHOPS
COMMUNITY FEEDBACK: KONA MOKU (MOANALUA – EAST HONOLULU)

- Confused why schools were not included when there are so many unused/open parking lots and rooftops that could (should) be generating clean energy which are spread across all communities and are already public resources (not always year-round)
- Open space/parks such as Ala Moana Beach Park or Kapi'olani Park
- Major grocery/retail stores for medicine and emergency supplies
- Narrow valley neighborhoods with only a few roads (and sub-trans/distribution lines) that lead to entire load centers
- Sites with EV chargers
- Will you be able to explain microgrids again?
- Vulnerable utility lines
- Community centers, both public and private (i.e., within subdivisions)
- Multigenerational homes with elderly
- Domestic violence/women's shelters
- KCC + Leahi + Kaimuki Fire Station + Diamond Head Theatre + Diamond Head movie studio could be resilience hub
- Critical shopping malls and nearby gas stations
- Don't forget about the community parks and pools
- Red Cross Headquarters is also nearby
- Grocery stores and large warehouses
- Language barriers
- Community Centers, Queen Theatre, National Guard Facility
- Security, including cameras to deter looting, which would probably happen in Waikīkī
- Entire school campuses - including student housing
- Convention center, after converted to an emergency shelter, and nearby shops
- Pumps for water treatment facilities and flood control; telecommunication towers
- Is this a way to bring nuclear or other dangerous power systems here?
- What is the span of a microgrid? How large or small of an area can a microgrid support?
- Major food distribution warehouses and non-restaurant kitchens
- Water pumping stations, sewage treatment, and hydroelectric facilities

RESILIENT AND RENEWABLE ENERGY COMMUNITY WORKSHOPS
COMMUNITY FEEDBACK: KONA MOKU (MOANALUA – EAST HONOLULU)

- Mobile microgrids to support emergency response teams, disaster resilience/response shelters, medical device charging stations, and personal electronic needs
- Facility management centers
- Homeowners associations
- Energy efficiency within the selected grids
- Indigenous sites, areas of cultural importance, churches
- What happening to the energy wheeling law?
- What about allowing for off-grid ecovillage communities that would be less reliant on County services?
- Traffic control center, emergency management center, telecommunication hubs
- What about creating planning department guidelines to allow for ecovillage communities so people can live off-grid, or at least less reliant on county services?
- FED/DOD must pitch in too
- Schools, community centers, community health centers, non-profits, areas where community members already gather

The following questions and comments were received via the written comment cards:

- Could a personal microgrid be built so they are moveable (away from lava) or protected (from hurricanes)?
- How will these projects be funded? Will the cost be put on customers?
- How is accountability and transparency built into this process, aside from gathering community input?
- What are additional outreach efforts the team is making to gather community input? Many people from low income or working class backgrounds aren't able to attend due to competing priorities (e.g., work, family, etc.).
- Great discussion! Glad that the community is being involved. Looking forward to more.
- Are there instances or examples that a microgrid can fail post-disaster?
- How do we pay for the microgrid?
- How long does it take to install a microgrid?
- What about broadband expansion?

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the Renewable Energy Zones analysis (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting of large-scale renewable energy resource development to decarbonize the energy system. He emphasized that the results are preliminary but are being shared as part of an effort to better include community in the energy planning process. Alani referenced concerns that have been raised with respect to equity and social justice and stated that this is an opportunity for community members to voice their opinion regarding specific factors and site suitability. The questions and input provided by workshop participants is summarized below.

- A workshop participant asked if there is any consideration as part of the competitive bidding process to require cost benefits or other community benefits for the communities hosting the projects. She emphasized that so many communities are having bear the burden with no real recognition or reward. Kurt responded that this is an excellent point and stated that there is important work to be done as part of future procurement processes. He explained that the next Request for Proposal (RFP) will be the Stage 3 RFP for Hawai'i Island, followed by the Stage 3 RFP for Maui and O'ahu; these are currently in the final Public Utilities Commission (PUC) review process. He stated that for the first time, these RFPs include requirements for community benefits; these requirements are largely the result of input received from communities such as West O'ahu, which have had to bear the burden of much of the infrastructure to date. He explained that this is a relatively new process and isn't likely to be perfect, but the goal is to ensure that the benefits are going directly to the host communities, with the investment addressing needs identified by the community. He also emphasized that there is still work to be done at the community level and there is ongoing discussion about other elements that can be incorporated to make the process as equitable as possible moving forward.
- A workshop participant stated that there is a lot of open space between Kapi'olani Community College and 22nd Avenue; much of this area is associated with the Department of Defense and could be a good place to site solar energy facilities. He noted that the neighborhood board tends to be concerned about siting anything on Diamond Head, so it would be important to have discussions with that group. He also stated that another location to consider relative to ensuring food availability is the area around the airport, as a way to keep food moving either to supermarkets or other key sites.
- A workshop participant noted that the Renewable Energy Zones analysis is focused on solar and wind, which are currently the main technologies. She asked how Hawaiian Electric's Integrated Grid Planning (IGP) process would incorporate new technologies (such as geothermal, offshore wind, hydrogen as those technologies become more viable in the future. Colton confirmed that the Renewable Energy Zones maps are based on solar and wind potential, because those are the resources for which data is currently available. However, as part of the IGP planning process, the goal is to develop an energy portfolio for the future; other technologies (such as geothermal, biomass, hydrogen) are candidate resources being evaluated as part of that effort. Colton stressed that they are doing their best to factor in advancements and cost of future technologies into the selection portfolio. As the process

moves forward toward development, those technologies will be considered. He noted that the IGP plan is intended to inform decision-making for the future, but what is actually developed in the future will likely differ from the plan as there are many non-technical aspects (such as land use policy) that will also factor into the final implementation plans. The workshop participant stated that there are some technologies that are ready for implementation that haven't necessarily been considered, such as micro-hydropower with dams and pumped storage hydro facilities.

- A question from Menti was discussed: "Will nuclear power or other dangerous technologies be considered as part of this process?" Colton stated that nuclear power is constitutionally banned in the State of Hawai'i. As such, planning for the future energy system is not currently considering nuclear power as an option.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti. These comments are summarized below; copies of the responses are contained in Attachment D.

The following questions and comments were received in response to the question: *What are the most important factors to consider for the siting of renewable energy on O'ahu?*

- Current land cover
- Work in tandem with newer Customer Distributed Customer Energy Resource programs, including aggregators, and Smart DER BYOD
- Will the sites that have highest potential for large renewable development be given high priority access to those resources? (In other words, will they be used for their land but it all goes to high users like Waikīkī/Urban Honolulu?)
- Cost
- Effectiveness of the location
- Community burden
- Cold beer!
- Native Hawaiian lands, no desecration
- Taking into account areas of historical/cultural/indigenous importance and preventing further mistrust
- Areas that lack their own generation
- Proximity to energy use
- The cost especially HOA groups with multi building complexes. How can those communities go solar and be self-sufficient with a reasonable cost to owners?
- Geographic energy balance
- What about allowing for off-grid ecovillage communities that are less reliant on County services?

- Impact on native species and whether the sites will cause a negative impact on indigenous flora/fauna
- Ecological factors
- Vacant lands but close to existing electric infrastructure
- While Honolulu doesn't have space for large development, they are the largest users of energy on the island and waste it haphazardly for aesthetics. Will we charge them more to use the renewable energy farmed in Wai'anae / North Shore?
- Multiple uses (e.g., agrivoltaics)
- Community residents in that ahupua'a have had a chance to express their preferences for siting or the aspects of a clean energy project. Placed on already developed land? Placed out of view? Allow the community to shape the project, to inform location.
- Will this project compete with probable prospective agriculture plots? Will sustainable food planning have to compete with your company striving for renewable energy? In other words, will you be willing to relinquish prime location for agriculture?
- Intersect of cost, renewable project resilience, and environmental impact
- Financial incentives, "Energy Cash Back" incentives
- Locations with wind, wave, and solar resources but avoid negatively impacting cultural, historic, natural and human resources
- Soil health
- Environmental impact and sustainability
- Existing infrastructure
- Community (includes ecological health) benefits
- Thoughts on vertical farming powered by renewable energy?
- Diverse portfolio
- Large scale utility sites should be kept in areas away from the general public
- Not losing efficiency because of a site that is far from the population that is using the energy; more distance often times can lead less efficiency
- Renewable energy is actually clean
- The trade-offs should be well understood. For example, if we use vacant land for renewable energy, that same land will not be available for affordable housing, or for more agricultural activities, etc.
- As we all just saw, an emergency proclamation could mean that dangerous technologies could be implemented without public input.

COMMUNITY FEEDBACK

WAIALUA MOKU (KA'ENA – KAPAELOA)

NOVEMBER 3, 2022

Introduction

The fourth of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the Waialua moku of O'ahu, which spans from Ka'ena to Kapaeoloa. The workshop was held on November 3, 2022 at Waialua Elementary School. There were approximately 10 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

Based on the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting hybrid microgrids, including other criteria that should be included in the analysis as well as specific facilities that should be considered because they are important to the community. He explained that Alani would be facilitating the discussion and reminded participants of the various ways that they can ask questions and provide input. The questions and input provided by workshop participants is summarized below.

- A workshop participant stated that it is possible for residents be off grid if they have adequate resource generation (for example, solar photovoltaic panels and battery storage). To the extent that residents are connected to the grid and have adequate resource generation, it is possible to create a microgrid; however, this costs a lot of money. He stated that when people initially started installing rooftop solar, Hawaiian Electric used to a formula to determine how much power they would buy but this changed over time. He acknowledged that Hawaiian Electric needs to collect enough money to cover their overhead costs but emphasized that consumers don't want to pay any more than necessary; he asked what Hawaiian Electric's formula will be to balance these needs. Ken explained that microgrids can be developed at different scales. For individual customers (such as a single residence), he stated that Hawaiian Electric has programs in place that provide compensation to customers for exporting electricity to the grid at certain times of the day; this also allows customers to use their battery system for backup power. He noted that there is another program currently in place (called "Battery Bonus") which provides extra compensation to customers that add battery systems. The purpose of the microgrid mapping effort discussed in the technical presentation is to identify potentially suitable areas where multiple customers can create a microgrid using their aggregated generation resources. Based on the current approach, this is a customer-based program such that the microgrid would be set up and paid for by the customer; this could be a single resident, a cluster of residents/businesses working together, or agencies that are trying to increase resilience of their system. The participant noted that if the customer is a fire department or hospital (or similar), the cost would come back to the taxpayers.
- A workshop participant stated that she works for the Board of Water Supply (BWS) and asked if Hawaiian Electric has coordinated with BWS or other agencies such as the Department of Education (DOE). She stated that it will be difficult to find a location on the North Shore that the community is comfortable with, depending on the visual impacts associated with the infrastructure. She stated that

it would be beneficial to collocate the infrastructure with other agency facilities that need to be connected with the Hawaiian Electric grid. For example, depending on the size of the infrastructure, it could possibly be collocated near the BWS reservoirs in Pūpūkea. She emphasized that the agencies are typically very supportive of any efforts to assist with disaster preparedness. As a second point, she also highlighted the fact that much of the available land along the North Shore is within the tsunami evacuation zone. For example, Waialua Elementary School is within the tsunami inundation evacuation zone; the only school that is not within the tsunami evacuation zone is the high school. Therefore, any proposed infrastructure should be sited in mauka areas. Specific facilities that should be considered for a microgrid include the hospitals in Kahuku and Wahiawa. Marc responded that Hawaiian Electric has been working with BWS as well as other state agencies such as Hawai'i Emergency Management Agency through their resilience working group. He also noted that Hawaiian Electric's Integrated Grid Planning process includes a stakeholder council, and BWS is represented there as well. The workshop participant suggested bringing those entities together with the community as this could make the process more efficient.

In response to the inquiry about the visual impacts, Kurt explained that microgrids typically do not involve highly visible infrastructure. The primary components involve hardening the system, such as replacement of existing wooden poles with new steel poles, to make it more able to withstand a disaster event, as well as electric switching units allow that portion of the grid to be isolated. He explained that they also require an interconnection point for some form of energy generation, whether it is renewable energy resources or a mobile generator. Together, these components allow a portion of the grid to be sectionalized and powered using backup energy in the case of an emergency. He noted that Hawaiian Electric would like input regarding the types of backup power the community would like to use for microgrids. He emphasized that there are no projects designed yet, so this is still a conceptual discussion.

- A participant asked if the microgrids would require a lot of agricultural land. He emphasized that much of the available land on the North Shore is agricultural land, including the land above the pumping station and water tank along Kamehameha Highway. He asked if microgrid infrastructure is allowed on agricultural land. Kurt responded that infrastructure would not be sited on the highest quality (Zone 1) agricultural land, but possibly on lower quality (Zone 2) agricultural land.

The participant asked more specifically about the need for energy storage as part of microgrids and if needed, whether this would occur on agricultural lands. Kurt explained that the need for energy storage would be based on the generation source. He reiterated that no specific projects have been designed yet, but if the community would like a microgrid powered by solar photovoltaics, then it would likely need to include battery storage. He emphasized that determining the appropriate place for siting energy generation is another part of the microgrid discussion for which Hawaiian Electric would like to get community input.

Ken clarified that the genesis of the hybrid microgrid mapping effort was to enable customers to identify whether a microgrid makes sense in any given location based on certain factors; however,

the data can also be used to site microgrids. Colton explained that there are a number of reasons that microgrids may be developed. In some cases, microgrids are developed by Hawaiian Electric to improve grid reliability in certain service areas. For example, Hawaiian Electric uses the generators that were built at Schofield Barracks to serve a microgrid for surrounding areas. However, Hawaiian microgrids can serve other purposes to meet the needs of customers – either individually or working together, perhaps in combination with a third party. As such, Hawaiian Electric is trying to facilitate that process by creating maps that provide relevant information; he emphasized that community input is needed to inform the analysis. He noted the previous questions regarding use of agricultural lands and types of energy generation, stating that these questions are ripe for discussion if the community is looking to develop a hybrid microgrid. He emphasized that these are decisions that should be made by those who have an interest in developing a microgrid. To further clarify, he explained that if an individual customer that wants to use rooftop solar and battery storage to run their home or business off-grid, this type of microgrid would be implemented and funded by the customer. In cases where Hawaiian Electric believes a microgrid is needed to improve grid resilience, such as in a remote service area, this could be implemented as a utility project (assuming that it is demonstrated to be cost effective in comparison to other alternatives as required by the Public Utilities Commission [PUC]). Hybrid microgrids, in which utility infrastructure is used to connect multiple customers, would be implemented and funded by that group of customers and/or a developer; he emphasized that Hawaiian Electric is trying to provide these opportunities for customers and has a tariff in place to help, but ultimately these actions would be customer-driven.

- An online participant noted that Hawaiian Electric is referring to “customers” but is also referring to a public function for microgrids in terms of disaster preparedness. She asked whether these microgrids would be publicly funded (for example, using federal or state funds) or whether the community would need to pool their resources to provide the necessary funding. Kurt explained that the term “customer” refers to individual residences as well as any other entity that receives electrical service from Hawaiian Electric. In terms of funding, he explained that in addition to customer microgrids, there could be some form of collaboration for larger scale microgrids such that they aren’t solely paid for by the community. For example, there could be opportunities for funding to come from the rate base or by issuing a Request for Proposal (RFP) for low-cost microgrid construction based on a competitive bidding process. Alani emphasized that the focus of the current discussion are hybrid microgrids that would support disaster preparedness for the community and would be publicly funded.

The participant also explained that there are community groups working across the state as part of the Hawai'i Hazard Awareness and Resilience Program. She explained that the group in Wahiawa spent approximately a year and a half identifying areas of strengths/weakness and developing a plan for their community. She suggested that Hawaiian Electric review those plans as they provide detailed information from the community about specific structures requiring protection and areas where infrastructure should be hardened. Kurt stated that this will be a valuable resource moving forward; he requested help getting access to the reports. He explained that Hawaiian Electric has

been working with Hawai'i Emergency Management Agency and other state and local agencies, but that this level of specificity from the community will help to further inform the planning efforts. Both Kurt and Katy emphasized that the goal is to identify specific facilities that are important to the community but may not be in official datasets.

- A workshop participant expressed support for building microgrids in the community. He recommended that the effort include an analysis of areas that may have existing asphalt (especially asphalt in need of repair), as this would provide an additional community benefit. He emphasized that infrastructure maintenance is a major issue on the North Shore, so solutions that incorporate microgrid opportunities with reinforcing existing infrastructure will be well received by the community. He noted that there could be opportunities if the community has plans to reuse the sugar mill, or at shopping centers, or possibly by looking at historic land uses (for example, agricultural land with disposal pits or old structures that may not be suitable for growing food); he noted that these may be small areas but could provide infill opportunities for energy infrastructure with minimal disruption to agriculture.
- A workshop participant stated that the microgrid concept is confusing, as she tends to think of a self-contained power generating unit. If the desire is to have customers work together to form hybrid microgrids, it would be good to identify and connect customers with grant programs and other funding opportunities. For example, Hawaiian Electric's stakeholder group could help to identify these types of resources for the community. She added that definitions are important and encouraged Hawaiian Electric to develop a list of key terms with the specific meaning as a way to improve communications.
- An online participant submitted a question via the chat function, asking if microgrids are a resource that would support emergency management in the event of an emergency. The participant stated that there aren't emergency shelters in the Waialua moku so any effective facility would have to be up the hill towards Wahiawa; however, shelters and emergency facilities are needed before they can be powered. Kurt confirmed that hybrid microgrids would be for critical facilities; in addition to the type of facilities identified in the technical presentation, he also emphasized that it also should include facilities that the community feels are important to have access to emergency power in the event of an emergency. The intent is for microgrids to make the grid more resilient by addressing specific vulnerabilities, thus contributing to emergency preparedness.

Kurt also explained that the Center for Resilient Neighborhoods (CERENE) is working on efforts related to these community needs. For example, based on a need identified by Hui o Hau'ula, they are currently working to build a resilience hub with the Hau'ula community. Ultimately, CERENE is working toward identifying opportunities for resilience hubs for communities across the island. In looking at the big picture, these two efforts dovetail in that if a community builds a resilience hub, it could be integrated with a microgrid for backup emergency power. He acknowledged that it is a lengthy and complex process but explained that there are a lot of efforts happening in parallel.

- A workshop participant stated that it is not good to ask people what they think and put the cart before the horse. He also stated the microgrid schematic in the technical presentation is pretty conceptual, so he is trying to better understand the design of a microgrid. He also stated that it would be nice if the design could be cookie-cutter and asked about the approximate footprint. He understands that it is early in the process but emphasized that it would be helpful to have more visuals. Alani acknowledged the input and stated that the team would work on providing more concrete information. Marc added that an example of a hybrid microgrid serving multiple critical facilities in the community could include a fire station, hospital, and emergency shelter all located within approximately one-half mile of each other.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti and in writing. These comments are summarized below; copies of the responses are contained in Attachments D and E (respectively).

The following questions and comments were received via Menti in response to the question: *What other community facilities are missing or should be included in the analysis?*

- Didn't see anything
- What will these micro grids look like?
- No more wind on north shore
- Visual impact on the landscape
- How big will they be?
- No offshore wind
- Looks fairly complete
- Social and economic justice

The following questions and comments were received in writing on the response cards and the online chat function in Zoom:

- Like to see complete emergency kit to store with long shelf life (years)
- Like to see education of real disaster (film); i.e., tsunami, hurricane, etc.
- Politicians need to prioritize the dollars to prepare (i.e., evacuation centers and supplies)
- What would make a microgrid...a poor investment?
- Water is #1 – make sure Department of Water can get water out of the ground (i.e., energy for pumps)
- Need stronger visuals that show footprint
- Microgrid is kind of confusing

- Grants etc. to help customers
- Definition of terms
- Information regarding Hawai'i Hazard Awareness and Resilience Program:
<https://www.representativeamyperruso.com/hharp>
- Wahiawā is ready for and needs such support - as we will be a clear evacuation site, and the military has told us many times that they will serve their own purposes first
- The Schofield-Wahiawā resiliency hub raises questions, for me, about that partnership, because we have been told many times that Schofield resources will be used for Schofield first. Can you come to Wahiawā and do a public presentation on that particular grid, please? Waialua definitely needs separate and more geographically accessible resilience support.

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the Renewable Energy Zones analysis (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting of large-scale renewable energy resource development to decarbonize O'ahu's energy system. He emphasized that the results are preliminary but are being shared as part of an effort to better include community in the energy planning process. He acknowledged that the North Shore is carrying a heavy load with respect to renewable energy, noting that future RFP processes will incorporate requirements for community benefits as part of a broader effort to improve energy equity. The questions and input provided by workshop participants is summarized below.

- A workshop participant stated that the North Shore Sustainable Communities Plan is currently being updated; this area (including Kahuku) currently has the greatest amount of renewable energy on the island. She stressed that the community does not support wind turbines, particularly offshore wind turbines. Alani noted this same comment on Menti and noted that community members can also add similar comments to the mapping tool at www.hawaiipowered.com/oahu.
- A workshop participant stated that future RFPs should include legal language to ensure that developers are compliant with the specific requirements so that the community doesn't need to hire their own lawyers. He emphasized that Hawaiian Electric should be in a position to make sure these issues are addressed so it doesn't fall to the community. Kurt stated that moving forward, the RFPs will include stronger language that holds developers more accountable. He explained that there will be a requirement for developers to document their dialogue with the community, the needs identified by the community, and the commitments made to the community; these documents will be made public as part of the RFP process and developers will need to comply with their commitments over the full contract term for the project.
- A workshop participant stated that based on discussions at neighborhood board meetings, her understanding is that rooftop solar programs are no longer available for the North Shore, in part because Hawaiian Electric's system cannot handle any more solar energy in this area. She indicated

that this is something that Hawaiian Electric needs to consider if they want to move forward with plans that include rooftop solar for resiliency. She also stated that other locations such as in East Honolulu should be considered for future wind projects. In addition, she emphasized the value of grant programs to help residents fund rooftop solar projects. Kurt acknowledged the comments and referenced the Solarize 808 program, which is a collaboration between Hawai'i Energy and Hawai'i Green Infrastructure Authority (HGIA). Through this program, community members that want to install rooftop solar can work together and issue an RFP for developers or installers as a way to lower costs. The program is starting in Kahuku and elsewhere in Ko'olauloa but will also be offered to the North Shore and Waianae communities as well. He noted that there is an opportunity to incorporate GEMS funding for people who qualify; in addition, Hawai'i Energy will work with homeowners to lower their consumption in parallel with installing rooftop solar. He also highlighted another program for shared solar (also referred to as community based renewable energy [CBRE]) which provides an opportunity for those without the ability for rooftop solar to still get access to solar energy. He noted that there has been a lot of improvements to the RFP process for shared solar based on community input; for example, if a project were to be constructed in the Waialua moku, the community that lives closest to the project would be given the first chance to subscribe such that they would directly benefit from the project. He explained that the shared solar program is still in the RFP process, but Hawaiian Electric will share more information with the community as the process moves forward.

- A workshop participant stated that microgrids seem fairly complex and require a lot of engineering. He suggested that it may be possible to incorporate some of the legacy infrastructure on the North Shore, specifically referencing the network of former plantation irrigation infrastructure (such as reservoirs, canals, and channels) for hydropower. He noted that Dole is in the process of unloading much of this infrastructure, but that water supply is critical to the agricultural community on the North Shore. If there are federal funds and other partners involved, use of this infrastructure as part of microhydro project (for example, a system that pumps water uphill at night with hydro power when it rains while solar isn't generating) could leverage resources and provide benefits in terms of both energy generation and food sustainability. Marc emphasized that other technologies beyond solar and wind are being considered and explained that the RFPs are structured in a way that allow developers to propose projects using these other technologies.
- An online participant submitted a question via the chat function, stating that they heard offshore wind is being planned off Ka'ena Point and asking if this is just a rumor as they don't see any offshore wind projects shown on Hawaiian Electric's map. Colton responded that several developers previously approached Hawaiian Electric regarding their interest in developing offshore wind. He stated that currently there are no proposals being considered by Hawaiian Electric. He noted that he is aware of at least one developer that has been discussing offshore wind with different neighborhood boards, but his understanding is that this would not involve Ka'ena Point.
- A workshop participant noted that solar developers prefer to site solar project in flat areas, which is typically agricultural land. He also noted that in terms of cost efficiency, projects that are proximate to major overhead lines do not require the cost of constructing new transmission infrastructure. He

offered the idea of suspending solar panels under the 46kV transmission lines, as this would solve for issues related to topography and proximity to existing infrastructure.

- A workshop participant asked if Hawaiian Electric stays apprised of housing and other types of development occurring in certain areas. He stated that there is a plan to add a large number of affordable rental housing units in Waialua; he suggested that it would be good for Hawaiian Electric to coordinate with the developers so they can incorporate elements into their development that allow it to be part of the microgrid and other similar planning efforts (rather than something that just gets added on later). Kurt explained that land use and plans for development typically depend on landowner preference. The purpose of these discussions is to capture the community's voice before landowners come forward and agreements are put in place. He explained that for any type of development, whether it is for renewable energy or housing, the developer and landowner would need to address land use as part of the permitting and regulatory process. He also noted that prior to the RFP process, Hawaiian Electric issues a Request for Interest (RFI) to solicit landowners that are interested in developing renewable energy on their land. In terms of adding electric loads as part of a new housing development, Colton explained that Hawaiian Electric works to integrate these into the planning process as much as possible. He explained that they have an entire team focused on providing electrical service to customers, and they proactively work with landowners and development teams to educate them on Hawaiian Electric's processes and to incorporate requirements for electrical service into their development plans.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti and in writing. These comments are summarized below; copies of the responses are contained in Attachments D and E (respectively).

The following questions and comments were received via Menti in response to the question: *What are the most important factors to consider for the siting of renewable energy on O'ahu?*

- No more wind on north shore
- Visual impact on landscape
- Solar on rooftops
- Sea level rise and concurrent environmental issues (cesspools, tsunami zone, etc.)
- Equity
- Make sure electricity generated in community stays in community
- Social and economic justice
- Cost effectiveness

The following questions and comments were received in writing on the response cards:

- Like HECO to ensure subcontractors and supplies are legally compliant so community does not need to hire lawyers

- Can HECO help the community fight BOEM plan to develop offshore energy; not a popular idea
- Is there a plan to get energy infrastructure in the ground?
- In 10 years if electrical cars equal 90 percent of vehicles with no gas, how much increase in electrical energy must be developed?
- Regarding agricultural land, we need an island-wide plan for energy land use
- Can land under the existing 46kV powerlines be used for solar? Note: If suspended or cables, the topography will not be so significant.
- North Shore has most amount of renewables
- Solar on rooftops
- Put wind in East Honolulu next

COMMUNITY FEEDBACK

KO'OLAUPOKO MOKU (WAIMĀNALO – KUALOA)

NOVEMBER 15, 2022

Introduction

The fifth of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the Ko'olaupoko moku of O'ahu, which spans from Waimānalo to Kualoa. The workshop was held on November 15, 2022 at Windward Community College. There were approximately 16 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

As part of the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Ken described a specific type of microgrid being pursued in the Ko'olaupoko moku based on work done through the Ko'olaupoko Resilience Initiative working group over the last several years. Through that process, certain areas within Ko'olaupoko were identified as critical customer hubs (CCHs). These CCHs include areas with critical facilities that serve multiple community lifelines; by adding switching equipment and other related components, these areas can be isolated from the grid and powered using mobile diesel generators during an emergency event. He explained that the CCHs identified through the Ko'olaupoko Resilience Initiative include multiple locations such as Olomana, Waimānalo, and the Windward Mall area in Kāne'ōhe. These CCHs were proposed as part of a FEMA grant (Building Resilient Infrastructure and Communities [BRIC]), which would provide federal funds for construction of the CCHs; although not selected for the original grant, the same CCHs will be re-proposed as part of another upcoming grant opportunity.

Kurt explained that the energy system in Ko'olaupoko is particularly vulnerable because there is no generation in the region and electricity is delivered via three transmission lines that traverse the Ko'olau Mountains. Although Hawaiian Electric is working to harden this infrastructure, it is still possible that it



may not withstand a severe hurricane. He stated that a lot of input was previously provided by community leaders as part of the Ko'olaupoko Resilience Initiative. He explained that Hawaiian Electric is looking to continue these discussions by getting additional input on other criteria that should be included in the microgrid mapping analysis as well as specific facilities that should be considered for a hybrid microgrid because they are important to the community. He explained that Alani would be facilitating the

discussion and reminded participants of the various ways that they can ask questions and provide input. Alani stressed that the purpose of the workshop is to gather the community's input to ensure the analysis is aligned with the community's priorities. The questions and input provided by workshop participants is summarized below.

- A workshop participant asked how large of an area a microgrid can serve. Ken responded that hybrid microgrids can generally serve an area equal to the area served by one distribution feeder. At the neighborhood level, this would be about one hundred homes (plus or minus); if considering a large facility (such as Windward Mall), a hybrid microgrid could also include some surrounding areas. He noted that microgrids can also cover smaller areas.
- An online participant asked if there is a timeframe for providing input on the hybrid microgrid mapping effort. Ken explained that this initial effort conducted by the National Renewable Energy Laboratory is scheduled to be complete by approximately March 2023; any input received by early January will be incorporated into the first set of hybrid microgrid maps. Kurt emphasized that this initial effort is just the beginning of the process and will provide a snapshot in time. He explained that the planning process will continue into the future and potentially will be followed by a procurement and development process, all of which would include additional opportunities for community input.
- A workshop participant referenced the parking lots at Windward Community College as being covered with solar photovoltaic panels, noting that France just recently committed to covering all of their parking areas with solar panels. He asked if school facilities with solar panels have been included in the microgrid mapping, noting that solutions for energy storage also need to be considered. Ken responded that the mapping effort identifies both the existing customer energy resources (such as existing solar panels on schools) as well as the energy load in any given area, as locations where resources and loads are balanced are good candidates for a hybrid microgrid. However, he explained that additional energy generation can be added to augment existing resources to support a microgrid, if necessary. The participant noted the value of a microgrid to provide backup power to an emergency shelter during a disaster event, but also emphasized the importance of energy storage for facilities with kitchens and refrigeration; these services are critical for community resilience during an emergency (much more so than individual homes). Ken agreed with the need for energy storage to augment solar photovoltaic energy produced during daylight hours. He explained that the analysis is focused on identifying suitable locations for microgrids based on the full range of criteria to help customers better understand potential opportunities for microgrid development. It is not intended to provide a detailed inventory of energy storage capabilities based on the load profile, but rather to provide an indication of the existing resources relative to the load. Alani stated that one of the prevailing questions is what technology will be used to provide power and storage for the microgrids, explaining that these are questions that require community input. Ken explained that the options to provide power and storage can be customized to fit a given area, such as mobile diesel generators (in the case of the Ko'olaupoko CCHs) which may or may not be augmented with solar photovoltaics and battery storage.
- A workshop participant asked if the microgrid size limit of approximately one distribution circuit is based on an analysis requirement of the ETIPP program or a specific technological or financial constraint. Ken explained that the mapping project originated with the microgrid services tariff, which enables customers to develop hybrid microgrids. Hybrid microgrids are intended to serve at or below the substation distribution feeder level; incorporating substations would significantly increase

microgrid complexity. As the distribution feeders generally serve up to 3 megawatts of load, this is the maximum size of potential microgrids (which aligns with the mapping project).

- Kurt referenced a question posted on Menti regarding what new infrastructure is needed in a neighborhood for a microgrid. Ken explained that development of a microgrid requires addition of switching equipment to allow the designated area to be isolated from the grid, as well as generating resources to provide the backup energy. In addition to these components, it is also important to harden overhead infrastructure within the microgrid (for example, replacing old wooden poles with new steel poles, or possibly undergrounding electrical lines) to maximize the resiliency of the system.
- A workshop participant asked about the scale of electronic infrastructure needed for a microgrid. He asked if it requires build-out of new facilities or if it is as simple as adding switching equipment to existing structures. Ken explained that microgrids are generally not simple systems. Customer microgrids are implemented behind the meter of a single customer using their own infrastructure; customer microgrids can include large facilities such as schools, which may include multiple buildings, but all behind a single meter. In contrast, a hybrid microgrid creates an electrical boundary around multiple customers by adding switches at various points on the surrounding electrical lines. Alani emphasized that every microgrid will be unique, based on the existing infrastructure and resources, and will require its own engineering solution. Ken agreed and explained that the microgrid mapping is just the initial step in a much larger process. The mapping is intended to provide an indication of whether a site is suitable for a microgrid; much more detailed engineering will be needed once the decision is made to pursue a project.
- A workshop participant asked whether the nearby residences would be included in the potential CCHs identified for Ko'olaupoko. For example, she referenced the CCH for Windward Mall and asked whether the houses along the CCH boundaries would also be connected. Ken responded that he does not think that this particular CCH would include houses, but that it is technically possible for homes to be included. Colton reiterated that from an engineering perspective, it is possible to design a microgrid around any combination of commercial structures, community facilities, and private residences. However, the CCHs focus on providing backup power specifically to facilities that provide community services (such as the mall, schools, and medical facilities). Alani noted that if there were to be a publicly funded microgrid that happened to include certain residences, this could benefit those property owners; he asked whether there would be any restrictions for publicly funded microgrids to only include critical facilities or if they could also include residences (for example, if it is not technically possible to add a certain critical facility without also including adjacent residences). Colton responded that there is flexibility and that it is possible for residences to be included. He emphasized that microgrids should be designed specifically around objectives based on the funding sources. For example, the BRIC grant uses FEMA funding, so the focus of the microgrid is to provide backup power for emergency services. If the objective is to provide a microgrid to serve a remote community (such as Hana on Maui), it would be designed to service all of the customers in that area.

- An online participant asked how many microgrids Hawaiian Electric is looking to establish in Windward O'ahu. Ken explained that the BRIC grant submitted for the CCHs identified through the Ko'olaupoko Resilience Initiative included three proposed sites. There were additional sites that were identified, but those three were prioritized for the grant application.
- Another online participant referenced diesel generators as a storage option and asked for a visual representation of the energy storage associated with a microgrid designed to incorporate resources from approximately 100 residences. Ken referenced the technical presentation, which includes concept photographs of the mobile diesel generators envisioned for use as part of the Ko'olaupoko CCHs. In this case, the mobile generators would be stored elsewhere; in the event of an emergency, the generators (along with a transformer and other electrical equipment) would be transported on trailers and staged in a parking lot near the CCH.
- A workshop participant emphasized that the CCHs identified to date include Waimānalo, Olomana, and Kāne'ōhe but do not include any locations in northern Ko'olaupoko. He asked that additional locations be considered in Kahalu'u, Waihe'e, and 'Āhuimanu; critical facilities include a utility baseyard, fire station, a boat ramp, helicopter landing zones, as well as Key Project and other community gathering locations. He noted that there is adequate space for parking trailers, noting the need for adequate diesel supply. He also explained that the housing branch of the state is looking at a new water system in the area between Waiāhole and Kualoa. The community is proposing a water system that is not electrically dependent and would flow from the Waiāhole Ditch tunnel (which is at an elevation of about 750 feet). Every day, water flows from Kahana Valley to Waiāhole, where it then gets allocated to either the leeward or windward side of the island. He emphasized that there is constant kinetic energy in the tunnel and could be used to produce hydroelectric power, which would be like having a diesel generator that doesn't run out of diesel. He stated that this energy could be used to support a microgrid for the surrounding community, including facilities with kitchens, refrigeration, and food distribution.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti and in writing. These comments are summarized below; copies of the responses are contained in Attachments D and E (respectively).

The following questions and comments were received via Menti in response to the question: *What other community facilities are missing or should be included in the analysis?*

- Supermarkets
- Farms, community kitchens
- Schools as community gathering places
- Food and supplies
- National Guard facilities

- Community Civic centers such as KEY Project (Waihe'e/Kahalu'u); Waiāhole Elementary School (high ground, centered in farm area)
- Key Project
- Perhaps Castle High School - its cafeteria has provided shelter during several storms, has a kitchen if needed, and can reduce strain on other shelters
- HiEMA storage facilities
- Correctional facilities
- Military facilities
- Hawai'i State Hospital
- In an emergency situation, shelters such as schools, should be included in potential microgrids
- What new infrastructure is needed in a neighborhood for a microgrid
- Due to the inclement weather in Ko'olaupoko, flooding and other negative impacts have to be taken into account
- Wastewater treatment plant
- Windward Community College with kitchen facilities
- Agriculture water reservoirs
- Is there a strategy for linking solar photovoltaic arrays (public and private) as a microgrid energy source?
- Potential hydropower from Waiāhole ditch
- Will microgrids be controlled at the customer level or will the utility company have control? Will they be for emergency use only or can they be used to reduce grid reliance?
- Hydropower

The following questions and comments were received via the written comment cards:

- Recommended resilience hub: 20-acre former Navy landfill in Haiku Valley (naturally protected site; Hawaiian homeland impact area; natural distribution point to the community)
- Why do you use the low emission scenario for sea-level rise vulnerability?
- Remind the presenters that the state's greenhouse gas goal is net negative (not net zero) carbon emissions

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the Renewable Energy Zones analysis (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input

regarding siting of large-scale renewable energy resource development to decarbonize O'ahu's energy system. He emphasized that this is just the early stages of a long-range planning effort but the goal is to make information more accessible so the community can more easily provide input. The questions and input provided by workshop participants is summarized below.

- A workshop participant asked if it possible to supply 100 percent of O'ahu's energy from renewable sources. Marc responded that the analysis to date show that it is possible but emphasized that it is going to take everyone working together as there are a lot of pieces needed to accomplish that goal. He noted that if we rely on solar and wind energy, it will require a lot of land to support those types of projects. He also reiterated that there are also other technologies that may be available for use in the future, depending on the price of those technologies. In addition, biodiesel is also considered a renewable energy source and is used at one of Hawaiian Electric's power plants. As such, there are various ways to achieve 100 percent renewable energy, with each option having a different cost. In any case, it will take coordination and partnership at all levels to achieve this goal.
- A workshop participant acknowledged that the Renewable Energy Zones analysis considered impacts to farmland and other areas that people might be concerned about. He asked whether the analysis has considered the use of urban and other built spaces, such as Windward City Shopping Center or Castle Hospital, and suggested the addition of parking lots covered with solar photovoltaics and other similar projects that ideally would not obstruct viewplanes. Marc explained that Hawaiian Electric has tried to spur this type of activity in several ways, including customer energy programs that enable solar photovoltaics on parking canopies and similar rooftop structures. He also described the shared solar (or community based renewable energy [CBRE] program), through which developers build projects and community members can subscribe to the energy produced by the project. In addition, Hawaiian Electric issues Requests for Interest (RFIs) to solicit landowners that are interested in building parking structure or larger rooftop solar photovoltaic systems. Alani noted that these are solutions that Hawaiian Electric can encourage but they cannot require landowners to construct these types of facilities.
- Alani referenced a comment received via Menti regarding the location of geothermal resources in Ko'olaupoko. Marc stated that there are known geothermal resources on Hawai'i Island and studies in the past tried to identify geothermal resources on the other islands. He explained that researchers at University of Hawai'i are further investigating geothermal potential and are currently considering more exploratory drilling. However, drilling is expensive and funding needs to be put in place. Although there are ways to guess at where there may be geothermal potential, drilling is the only way to confirm whether there is a viable resource.
- A workshop participant asked if Hawaiian Electric has revisited the hosting capacity limits for larger customers that are behind a meter and are looking to develop more renewable resources. Marc confirmed that Hawaiian Electric updates the capacity analysis each time it issues a Request for Proposal (RFP) and information regarding the remaining capacity on the various transmission lines is made available to developers through the RFP process.

Kurt closed the meeting by acknowledging the work being done by the Center for Resilient Neighborhoods (CERENE). He explained that they are working at the grassroots level with communities to identify locations for resilience hubs. These are structures that can be used as community gathering places and provide key services to the community during an emergency event. These efforts dovetail together, as it would be ideal for the resilience hubs to be connected to other critical facilities as part of a microgrid.

In addition to the comments discussed during the workshop, the following questions and comments were received via Menti in response to the question: *What are the most important factors to consider for the siting of renewable energy on O'ahu?* Copies of the responses are contained in Attachment D.

- Amount of land needed
- Creating a safe distance from schools and other community facilities
- Every community should have renewable energy to support themselves. Some communities are taking too much of the load. This should also help Hawai'i be more resilient.
- Lifecycle cost to customers
- Where possible build in already disturbed areas as opposed to undeveloped areas.
- Location of geothermal resources in Ko'olaupoko
- Visual obstruction to landscape
- Survivable/resilient
- Agreed on the visual obstruction to landscape.
- Does the amount of renewable energy a community can generate determine its ability to host a microgrid?
- Explore hydro options
- Proximity to Ko'olau Substation so that the resource can flexibly support the most electrical circuits possible at the lowest cost and complexity
- Good idea, building upon already developed areas
- Ecological impact that it will have throughout the entire ahupua'a. One small change will have a cascade effect on all components (lo'i, mala, loko i'a, etc.).
- Acceptable site for nuclear SMR
- Kāne'ōhe Bay is a unique natural and cultural resource so should not become used to site any generation sources
- How the state can contribute to siting options – e.g., state buildings, state housing projects - the ability for the state and county to use their existing buildings for energy projects. And fast track them?

COMMUNITY FEEDBACK

'EWA MOKU (HONOULIULI - HALAWA)

NOVEMBER 17, 2022

Introduction

The last of six Renewable and Resilient Energy Workshops hosted by Hawaiian Electric was held in the 'Ewa moku of O'ahu, which spans from Honouliuli to Halawa. The workshop was held on November 17, 2022 at Leeward Community College. There were approximately 11 attendees, as well as Hawaiian Electric staff; a list of attendees is included in Attachment C.

Hybrid Microgrids: Community Feedback

Based on the presentation of technical information regarding hybrid microgrids (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting hybrid microgrids, including other criteria that should be included in the analysis as well as specific facilities that should be considered because they are important to the community. He also noted that the microgrid mapping process considers existing sources of resource generation that can be used for backup power (e.g., rooftop solar panels), but noted that Hawaiian Electric would also like community input on the type of technologies that should be explored if additional generation is needed to power the microgrids. He explained that Alani would be facilitating the discussion and reminded participants of the various ways that they can ask questions and provide input. Alani stressed the important of community-based knowledge and stated that the purpose of the workshop is to gather feedback to ensure the analysis is aligned with the community's priorities. The questions and input provided by workshop participants is summarized below.

- A workshop participant stated that he thinks various places to recharge electric cars should be included and that these locations should be widely distributed.
- A workshop participant asked how Hawaiian Electric will prioritize locations based on the community input that is received. Katy responded that the criteria are currently equally weighted in the analysis. However, the team recognizes that not everything is equally important to the community in the event of an emergency, and emphasized that the goal of these discussions is to identify the criteria as well as specific facilities that are most important to the community. She stated that the team is open to suggestions, but they are thinking that the frequency of responses from the community (for example, around concepts such as food distribution centers, schools, etc.) indicates relative importance for that moku, and thus would be used as the basis for assigning weights. Alani emphasized the importance of community input to determine the highest need.
- Alani referenced a question received via Menti: "Can Waiau Power Plant be repurposed into a microgrid?" Marc explained that Waiau Power Plant is one of Hawaiian Electric's main centralized power plants that serves the island of O'ahu and has blackstart capability in the event of a widespread blackout. In other words, if Hawaiian Electric needs to restore power to the island-wide grid, Waiau Power Plant would help with this process. Therefore, this power plant would not be used for microgrid purposes as it is used to help maintain the island-wide grid.

Kurt acknowledged the work being done by the Center for Resilient Neighborhoods (CERENE) at the grassroots level, explaining that they are partnering with communities at the neighborhood level to



identify locations for resilience hubs. He stated that their work has been informed by lessons learned from disaster incidents around the world and focuses on facilities that can serve as a gathering place and provide key services to the community during emergency events (including food distribution, refrigeration, medical services, etc.). He explained that resilience hubs can be designed to have their own power source, but also are good candidates for

microgrids. In addition to partnering with Hawaiian Electric, CERENE is also working with the City and County of Honolulu Office of Climate Change, Sustainability and Resiliency and Hawai'i Emergency Management Agency.

In addition to the comments discussed during the workshop, additional questions and comments were received via Menti in response to the question: *What community facilities are missing or should be included in the analysis?* These comments are summarized below; copies of the responses are contained in Attachment D.

- Shopping centers and grocery stores
- Need to add grocery stores to critical facilities
- UHWO and LCC
- Schools
- HART rail transit stations, ROCs, MSFs
- Central O'ahu Regional Park
- Key military bases
- Filipino community center in Waipahu
- Kroc Center
- Mililani Town Center
- Walmart Kunia Pearl City
- Costco Kapolei and Waipio
- 'Ewa Foodland, Safeway, Longs
- Waipio Costco/Kaiser Waipio/EMS Waipio

- Pearl City High School
- 'Ewa and Kapolei Library
- Campbell, Kapolei, Mililani, Waipahu High School
- Gas stations
- Don Quijote and Seafood City Waipahu
- Coast Guard Air Station
- Mililani High Tech Park
- Pacific Palisades Community Center
- Can Waiiau power plant be repurposed into a micro grid?
- Department of Health on Waimano Home Road
- Sam's Club Pearl City
- Suggest looking at gaps in existing facilities map to fill in spots so microgrids are well distributed
- Target Kapolei Salt Lake

Renewable Energy Zones: Community Feedback

Based on the presentation of technical information regarding the Renewable Energy Zones analysis (as summarized previously in this report), Kurt reiterated that Hawaiian Electric is looking for input regarding siting of large-scale renewable energy resource development to decarbonize O'ahu's energy system. He acknowledged that there are already renewable energy projects sited in the 'Ewa moku and emphasized the need for community input moving forward. The questions and input provided by workshop participants is summarized below.

- A workshop participant asked if there are still discussions about wind power, particularly offshore projects. Marc explained that Hawaiian Electric's process to acquire renewable projects involves issuing a Request for Proposals (RFP) which allows developers to submit proposals for projects; these projects may involve a range of different technologies including offshore wind. There are currently no proposals for offshore wind projects in Hawai'i but Hawaiian Electric is aware of offshore wind developers that are talking with certain communities about potential projects. Hawaiian Electric has not taken any technologies off the table but is working to determine which technologies would be acceptable in different communities. Alani asked Marc to confirm that Hawaiian Electric cannot restrict the proposals that are submitted as the parameters of the RFP process are set by the Public Utilities Commission (PUC); Marc confirmed these points.
- Alani referenced a question submitted via Menti: "How can nearby residents see direct benefits from energy projects." Kurt explained that there has recently been community input relative to this topic and relates to the purpose of these workshops. Specifically, Hawaiian Electric has been working with

the West O'ahu community in response to input shared about the energy burden associated with projects sited in this region. Through this process, various community leaders and organizations aligned their interests and submitted a letter to the PUC with input regarding the Hawaiian Electric RFP process for shared solar (also referred to as community based renewable energy [CBRE]) projects. The shared solar projects allow community members to subscribe and achieve the same benefits as customers with rooftop solar photovoltaic systems. The PUC adopted most of the recommendations submitted by the West O'ahu community, resulting in requirements for both for the shared solar RFP as well as all other RFPs moving forward. In particular, community members that live closest to a shared solar project will be given access to an energy subscription before other residents around the island. Other requirements include incentives related to hiring local staff and workforce development. Furthermore, based on this input and the support of the PUC and other collaborating agencies, the next round of RFPs will require projects to provide a community benefits package, with a minimum dollar amount based on the size of the project. The RFPs include language requiring developers to work directly with the community to identify specific needs and ensure that the community benefits or funding directly support those needs. He stated that there is more information that can be shared, but these are examples of improvements that have been made to the procurement process to provide direct benefits to the community and illustrate the value of community input. Alani emphasized that when projects are selected through the RFP process, there will be specific opportunities for the community to provide input to the developers regarding community needs and allocation of community benefits.

- A workshop participant asked if there is expected to be any mandates for solar photovoltaics on state and county facilities. More specifically, he stated that he spoke with the branch manager at the Moloka'i public library who was wondering about the process for getting solar installed on a building such as a library. In terms of the requirements, Marc stated that this is not something that Hawaiian Electric can mandate and would instead require legislative action. There have previously been bills contemplated that would require solar photovoltaics to be added on state and county buildings. There are also policies such as the University of Hawai'i's net zero goal, based on which Hawaiian Electric has been working with University of Hawai'i to add solar photovoltaic systems at their various campuses around the state. Regarding the question about the Moloka'i public library, Marc explained that customers typically work with a contractor/installer to enroll in one of Hawaiian Electric's programs.
- Alani referenced a question received via Menti: "Can the site selection be part of the microgrid design and community resiliency?" Ken responded that the Renewable Energy Zones analysis is intended to identify opportunities for larger grid-scale projects to provide energy for the island-wide grid. He noted that these projects could include elements that help to improve community resilience, but these would add layers of complexity and cost.
- Alani identified another question received via Menti: "What kind of community benefits are offered or available?" Kurt explained that based on language currently included in the RFP, there are no specific limitations; it will be up to the community to identify their specific needs and the type of

benefits that would address those needs. The intent is to not be prescriptive and rather to encourage developers to engage meaningfully with communities to develop a community benefits package. The developers will be required to provide a minimum dollar amount for the community benefits, which is currently set at \$3,000 per megawatt per year over the full contract term for the project (20+ years). Based on engagement with the community, the developer will be required to document the community input; this information will be made publicly available and used to hold the developers accountable.

- A workshop participant asked how small a microgrid can be to catch Hawaiian Electric's interest. Ken responded that customer microgrids can be as small as a single home, while hybrid microgrids can be as large as 3 megawatts. He explained that Hawaiian Electric is not necessarily seeking microgrids as part of the procurement of larger renewable energy projects, as these are intended to provide energy for the island-wide grid. As such, the larger grid-scale projects do not necessarily need to include microgrid functionality.
- A workshop participant asked about the total consumption or load for the Hawaiian Electric system. He asked about the progress toward reaching the goal of 100 percent renewable energy and asked how much more renewable energy will be needed as the climate gets hotter. Marc explained that Hawaiian Electric's Renewable Portfolio Standard (RPS) for the multiple islands it serves is approximately 38 percent as of 2021. The RPS for O'ahu is just over 30 percent, while Maui and Hawai'i Island are higher (40+ percent and 60 percent, respectively). He noted that the law was recently changed, with a new formula used to calculate the RPS, such that these estimates will be slightly lower at the end of this year. He emphasized that there is still a lot of work needed and that the Renewable Energy Zones analysis is intended to help determine how best to reach 100 percent renewable energy.
- A workshop participant asked how the transition to 100 percent renewable energy will change the cost of energy. Colton explained that the transition started with the most cost-effective resources, which included wind and solar projects; at certain times, the price of these resources has been much lower than the cost of fossil fuel generation while other times it has been more expensive. Nevertheless, the transition to renewable energy provides both environmental benefits as well as price stability. For example, as oil prices are currently much higher than what they were a year ago, the renewable resources purchased five years ago (at a rate that was more expensive than the price of oil) are now cost effective. Moving forward, as more renewable resources are developed, lower cost projects will be exhausted and higher cost projects will need to be developed. Hawaiian Electric is working hard to make sure future renewable energy projects are as cost effective as possible; for example, the Renewable Energy Zones analysis will help inform planning for cost effective infrastructure for interconnection. In addition, it will be important to stay abreast and consider use of new and improved technologies. Moving forward, it is likely that the cost of renewable energy will increase as more is added to the system. However, it is important to recognize that costs will not automatically go up as they will be relative to the price of oil (which can be highly unpredictable). For the renewable energy projects that are being added to the system, Hawaiian Electric is working with

independent power producers and entering into contracts with fixed prices for the 20-25 year contract term; this price stability will be very valuable in the future.

- Alani referenced a question received via Menti: “How can private landowners (shopping centers with big parking lots) be incentivized to get solar, potentially CBRE?” Marc explained that the CBRE program involves issuance of an RFP seeking proposals for procurement; individual landowners work with a developer to prepare and submit a proposal for a project on their land. He explained that an RFP was recently issued and Hawaiian Electric is currently in the process of evaluating those proposals. Colton added that Hawaiian Electric also issues Requests for Interest (RFIs) to identify landowners that may be interested in leasing or selling property for development of renewable energy project. The list of landowners that respond to the RFI is made available to developers and can improve the chance of connecting with a developer.
- Alani highlighted another question received via Menti: “Are there any shared solar projects available today for communities in the ‘Ewa moku?” Kurt responded that there are currently no shared solar projects available in the ‘Ewa moku. However, Hawaiian Electric will actively promote and offer shared solar subscriptions to the community when available in the future. An announcement is expected soon on the selections for the low and moderate income shared solar program, followed by selections for the shared solar RFP issued earlier this year. He clarified that the proposals that are submitted to Hawaiian Electric are based on a partnership between a willing landowner and willing developer, and that Hawaiian Electric does not have any control over the location of the proposed projects.
- Another question submitted via Menti: “How can Hawaiian Electric involve more community members in these kinds of discussions besides these kinds of meetings?” Kurt explained that these workshops are just the beginning of the process and Hawaiian Electric is willing to have additional conversations with community in whatever form is preferred. He also referenced resource tools available at www.hawaiipowered.com/oahu, including a map of O‘ahu where community members can drop pins and add comments regarding suitable and unsuitable locations for potential renewable energy projects. He reiterated that all input will be documented and considered in the planning process.
- A workshop participant asked how the workshops were promoted. Kurt explained that Hawaiian Electric provided notification regarding the current workshops to the neighborhood boards, Hawai‘i Energy Policy Forum, Star Advertiser, Pacific Business News, and social media channels as well as requested that various elected officials share the information through their channels. He emphasized that much of the success in getting community members to attend is via word of mouth, so asked participants to share the information with their respective circles and offered to have follow-up meetings with the community if desired.
- Alani highlighted another question via Menti: “Can we prioritize selecting projects that are being developed by local organizations and businesses rather than those that are based outside of Hawai‘i?” Kurt explained that the RFPs currently do not include language to this effect and all

developers are evaluated equally. However, he stated that he thinks this is an important concept to consider; Hawaiian Electric cannot make this decision but it could be recommended to the PUC by the community.

- Kurt referenced a question received via Menti: “How can communities be part of the selection process?” He stated that this is a good question but one for which Hawaiian Electric does not have an answer. He emphasized that this is another concept that can be discussed with the community and stakeholders in terms of how best to capture community sentiment as part of the RFP process. He explained that Hawaiian Electric has been reviewing how this issue is handled by utilities on the mainland but has not yet identified a good model. As of now, the best approach is to continue having open discussions and working through issues together.

Alani asked for clarification regarding how projects are selected. Kurt explained that selection is based on criteria set forth in the RFP – that is, the extent to which a developer can demonstrate that their project meets the written criteria in the RFP (e.g., ability to interconnect to the grid, reasonable cost per kilowatt hour). Alani asked for clarification regarding who sets the criteria. Kurt explained that are opportunities for public input on the RFPs before they are finalized, noting that this was the way that the West O’ahu community submitted their recommendations. This work is done in partnership with the PUC, and Kurt emphasized that they are trying to make this a more inclusive process.

- A workshop participant asked if there will be other future workshops on these topics. Kurt responded that there will certainly be future opportunities to provide input relative to both the hybrid microgrid and Renewable Energy Zones analyses. He explained that the hybrid microgrid map is meant to be a snapshot in time and will serve as the foundation for future efforts that will dive deeper into the details of whether microgrids are a good fit in specific locations; there will be continued community engagement as this process moves forward. Similarly, the Renewable Energy Zones analysis is also a preliminary analysis that is being shared to engage the community early in the planning process. Additional information will be shared as it becomes available (for example, inclusion of other renewable energy technologies). He referenced www.hawaiipowered.com/oahu, which includes an interactive map where community members can add pins and comments regarding the suitability of specific sites for renewable energy projects. In addition, there will be continuing discussions with the community moving forward. All input received will be documented and incorporated into the long-term planning process.

In addition to the comments discussed during the workshop, the following questions and comments were received via Menti in response to the question: *What are the most important factors to consider for the siting of renewable energy on O’ahu?* Copies of the responses are contained in Attachment D.

- How can nearby residents see direct benefits from energy projects?
- Cost-effective and reliable
- Improving reliability

- Multi use land, all parking lots, warehouses, state and county facilities
- Environmental equity and impact on the community
- Minimize overhead wires
- Projects should be sited close to users
- Minimize impact to landscapes, mountain slopes, etc.
- Local jobs and technical education programs
- Can we prioritize selecting projects that are being developed by local organizations and businesses rather than those that are based outside of Hawai'i?
- Siting commitments to create public benefits to host communities - plus large-scale storage (CO₂, water/mass lifting, etc.)
- What kind of community benefits are offered or available?
- Good community engagement
- How can the community be part of the selection of sites and projects?
- Can the site selection be part of the microgrid design and community resiliency?
- Help community with resiliency
- Those communities where solar is not ideal (i.e. homes bordering golf courses)
- How can private landowners (shopping centers with big parking lots) be incentivized to get solar, potentially CBRE?
- Are there any shared solar projects available today for communities in 'Ewa Moku?
- Appreciate seeing this on 'Olelo!
- Make sure some women are involved!
- Utilize brown fields. Partner w/public-private surface parking lots. DO NOT TAKE AWAY ag land or commercial mix use lots.
- How can HECO involve more community members in these kinds of discussions? Besides these kine meetings.
- Diverse sources

ATTACHMENT A

NOTICE OF WORKSHOP

ATTACHMENT B

TECHNICAL PRESENTATION

ATTACHMENT C

WORKSHOP ATTENDEES

Ko'olauloa Moku (Waimea – Ka'a'awa)
Monday, October 24, 2022
Kahuku Elementary School

Name	Organization (if any)
In-Person Participants	
Dotty Kelly-Paddock	Hau'ula Community Association
Kendal Leonard	Hawai'i Natural Energy Institute
Ben Shafer	Friends of Kahana Community
Stephany Vaioleti	Ko'olauloa Neighborhood Board
On-Line (Zoom) Participants	
Jin US	
Ali Andrews	Shake Energy
Yvonne Hunter	Hunter Communications Inc.
Bob Kagamida	Hitachi
Parker Kushima	Hawai'i State Energy Office
Jae-Hyup Lee	South Korean Company (partner w/ HNEI on microgrids for Hawai'i Island)
Andrew Okabe	Public Utilities Commission (PUC)
Nick Sinchek	Hawai'i State Energy Office
James Vaughn	

Ko'olauloa Moku (Waimea – Ka'a'awa)
Thursday, December 1, 2022
Hau'ula Community Center

Name (In-Person)	Organization (if any)
Ginny Alatasi	
Steve Cheney	
Raynae Fonoimoana	
Amanda Ho	Hawai'i State Energy Office
Ronnie Huddy	HCA / CERT
Linda Longi	
Wanda Kamauoha	
Dotty Kelly-Paddock	Hau'ula Community Association
Parker Kushima	Hawai'i State Energy Office
Lorraine Matagi	Hau'ula Community Association
Carlos Mozo	
Wade Nakashima	
Debra Parr	
Barbara R	
Dan R	
Dave Siroskey	
Ella Siroskey	
Ailene Sproat	
Barbara Tatsuguchi	
Miriam Young	
On-Line Participants (Zoom)	Organization (if any)
Kathy Boyle	
Gregory Weiss	

Wai‘anae Moku (Nānākuli – Keawa‘ula)
Wednesday, October 26, 2022
Agnes Kalaniho‘okaha Community Learning Center

Name	Organization (if any)
In-Person Participants	
Chris Fujimoto	University of Hawai‘i – Kapi‘olani
Sidney Higa	Hooulu Holdings
Kapua Keliikoa-Kamai	Wai‘anae Valley Homestead Community Association
Parker Kushima	Hawai‘i State Energy Office
Roland Lee	Nānākuli-Mā‘ili Neighborhood Board
Miku Lenentine	University of Hawai‘i – Kapi‘olani
Helen Reddy	Center for Resilient Neighborhoods (CERENE)
Cynthia Rezentes	Nānākuli-Mā‘ili Neighborhood Board
Nicole Shintani	Hawai‘i State Energy Office
Georgette Stevens	‘Ōlelo Community Media
On-Line (Zoom) Participants	
JMA	
NJUNG	
Ali Andrews	Shake Energy
Amanda Ho	
Yvonne Hunter	Hunter Communications Inc.
Jo Jordan	
Chad Miura	
Andrew Okabe	Public Utilities Commission (PUC)
Sharlette Poe	Wai‘anae Neighborhood Board

Kona Moku (Moanalua - East Honolulu)
Tuesday, November 1, 2022
Kapi'olani Community College

Name	Organization (if any)
In-Person Participants	
Ali Andrews	Shake Energy
Leo Asuncion	Public Utilities Commission (PUC)
Andrew Calise	Honeywell
Winifred Canney	Center for Resilient Neighborhoods (CERENE)
Stephanie Chang	Stephanie Chang Design Ink
Michele David	
Tristan David	Center for Resilient Neighborhoods (CERENE)
Michael Flores	
Dr. Robert Franco	Center for Resilient Neighborhoods (CERENE)
Sarah Harris	Office of Climate Change, Sustainability & Resiliency
Carol Hoshiko	Kapi'olani Community College, Office of Continuing Education & Training
Parker Kushima	Hawai'i State Energy Office
Miku Lenentine	University of Hawai'i – Kapi'olani
James McCay	DHA Coop
Mary Janell Murro	University of Hawai'i, Public Administration
Dean Nishina	Division of Consumer Advocacy
Andrew Okabe	Public Utilities Commission (PUC)
Monique Schafer	Hawai'i State Energy Office
Eric Teeples	University of Hawai'i at Manoa School of Architecture
Cuong Tran	University of Hawai'i, National Disaster Preparedness Training Center
Jose Andres Zavala	Center for Resilient Neighborhoods (CERENE)
On-Line (Zoom) Participants	
Anand	
Marta	
Kodi Benozza-Tabion	
Jenny Brown	Center for Resilient Neighborhoods (CERENE)
Iwalani Clayton	Center for Resilient Neighborhoods (CERENE)
Valarie Cleopas	
Leila Jaffuel	
Yun-Su Kim	
Luke Lenentine	
Chad Miura	
Kelsey Nakagawa	
Jenn Lieu Nickel	
Denise Pierson	Kapi'olani Community College, Civic & Community Engagement
Suwan Shen	Urban & Regional Planning, UH Manoa
Angela Soto Balmores	Center for Resilient Neighborhoods (CERENE)

Waialua Moku (Ka'ena - Kapaeloa)
Thursday, November 3, 2022
Waialua Elementary School

Name	Organization (if any)
In-Person Participants	
Andrew Calise	Honeywell
Richard Figliuzzi	North Shore Resident
Alex Kahl	Ala Mai Farmstead
Agnes Leinau	Resident
Bob Leinau	Resident
Reed Matsuura	City Council, Staff
Kathleen Pahinui	North Shore Neighborhood Board
On-Line (Zoom) Participants	
Raquel Hill-Achiu	
Andrew Okabe	Public Utilities Commission (PUC)
Amy Peruso	Representative (Wahiawa, Whitmore Village, Launani Valley)

Ko'olaupoko Moku (Waimānalo - Kualoa)
Tuesday, November 15, 2022
Windward Community College

Name	Organization (if any)
In-Person Participants	
Amra Brightbill	Marine Corps Base Hawai'i - Kāne'ōhe Bay
Noah Doerr	Coffman Engineers
Malia Hagmann	University of Hawai'i at Manoa
Naomi Kuwaye	Public Utilities Commission (PUC)
Adriel Lam	Kāne'ōhe Neighborhood Board
Miku Lenentine	University of Hawai'i – Kapi'olani
Amy Luersen	N/A
Paul Luersen	N/A
Jacob Milanczuk	Kalakaua Middle School
Corinne Nishina	N/A
Dean Nishina	Division of Consumer Advocacy
John Reppun	KEY / Waiāhole Neighborhood Board
Jack Shriver	Power Engineers
Maria Tome	Hawai'i State Energy Office
Kirsten Baumgart Turner	Hawai'i State Energy Office
He Xu-Sadri	Marine Corps Base Hawai'i (MCBH)
On-Line (Zoom) Participants	
Anand	
Demaney	
Lora	
Lisa Kitagawa	Representative (Kāne'ōhe, Kahalu'u, Waiāhole)
Andrew Okabe	Public Utilities Commission (PUC)
Meagan Ostrem	Marine Corps Base Hawai'i (MCBH)
iMo Radke	
Nick Sinchek	Hawai'i State Energy Office
Matthew Sutton	
Claudine Tomasa	
David Warner	

‘Ewa Moku (Honouliuli - Halawa)
Thursday, November 17, 2022
Leeward Community College

Name	Organization (if any)
In-Person Participants	
Macklin Burnham	N/A
Marcey Chang	Division of Consumer Advocacy
Mark Glick	Hawai‘i Natural Energy Institute (HNEI)
Amanda Ho	Hawai‘i State Energy Office
Leila Jaffuel	Ember Media
Parker Kushima	Hawai‘i State Energy Office
Miku Lenentine	University of Hawai‘i – Kapi‘olani
Kendal Leonard	Hawai‘i Natural Energy Institute
Nathan Muramatsu	N/A
On-Line (Zoom) Participants	
Kat K	
Andrew Okabe	Public Utilities Commission (PUC)

ATTACHMENT D

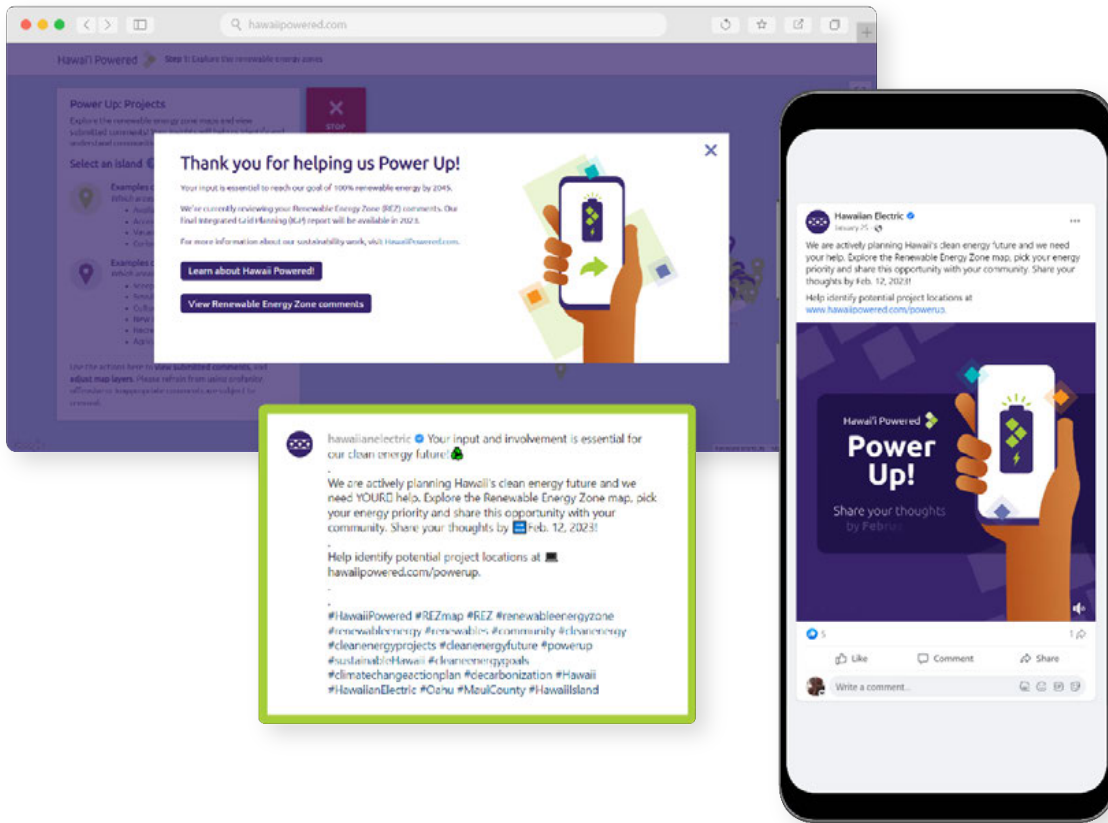
COMMUNITY INPUT RECEIVED VIA MENTI

ATTACHMENT E

COMMUNITY INPUT RECEIVED VIA RESPONSE CARDS

1.10 Power Up

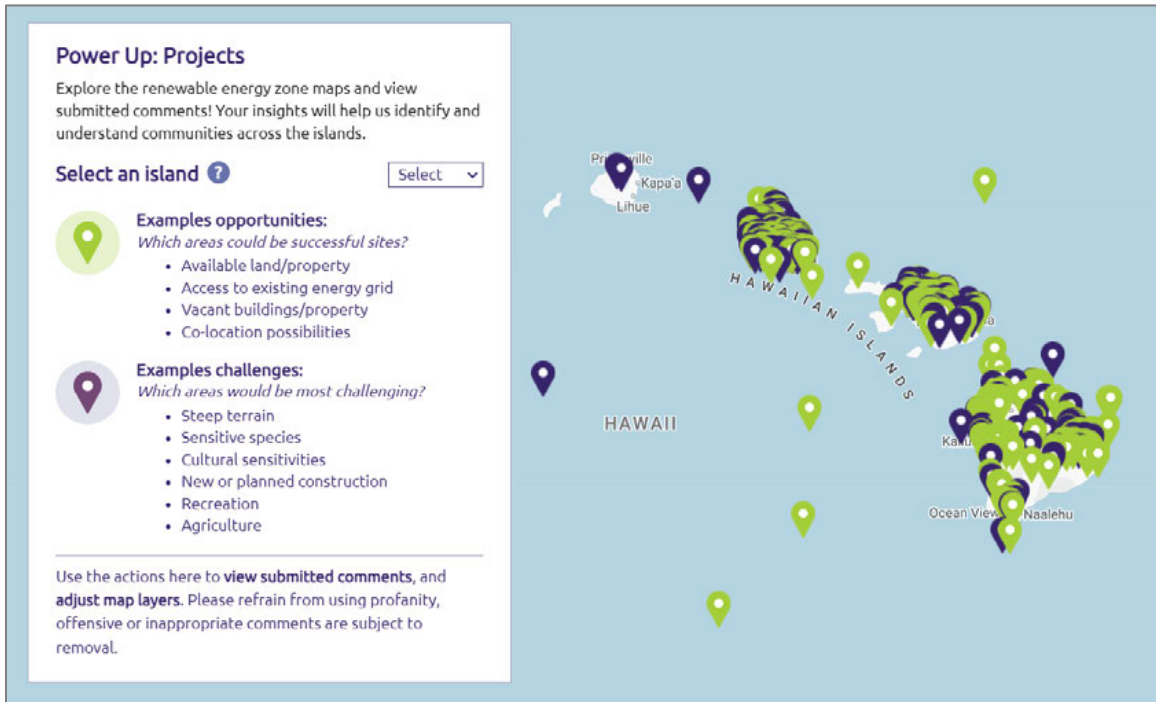
Materials used for the “Powered Up” media campaign from January 17 to February 12, 2023, to promote the REZ website and public input opportunity.



Platform	Total Clicks	Total Impressions
Facebook	3,257	111,245
Instagram	199	67,608
Meta Story Placement	1,908	348,667

1.11 Renewable Energy Zone (REZ) Map Comments

REZ map comments were gathered both in-person and virtually from September 2022 through February 2023.



1.11.1 REZ Comment Categorization Guidelines

All REZ comments were categorized by Integrated Grid Planning (IGP) consideration -- time, affordability, land use, community, resilience and reliability -- using the following guidelines:

IGP Consideration	Related Topics
Time	Goal of 100% clean energy by 2045
	Political administrations (state and federal)
Affordability	Customer bills/rates
	Financial incentives or credits for clean energy programs (e.g. shared solar)
	Cost to build new infrastructure and/or expand existing infrastructure
Land Use	Potential placement of grid-scale projects and/or electric vehicle charging stations
	Support for making rooftop solar required in certain cases
Community	Benefits for communities hosting renewable projects
	Cultural and historical sensitivities
	Animal and vegetation sensitivities
	Concerns and/or requests from landowners, renters, tenants, etc.
	Individual actions and behavior changes
Resilience and Reliability	Renewable energy generation methods other than solar and wind (e.g. hydro, nuclear, geothermal, etc.)
	Microgrids and battery storage
	Optimal and/or challenging geographic and weather conditions
	Outages and isolation

1.11.2 REZ Comment Takeaways

After categorizing the REZ comments, Hawaiian Electric synthesized takeaways that are specific to each island. Takeaways are specific to each island to acknowledge distinctive community needs and desires, which aligns with Hawaiian Electric’s ongoing outreach strategy.

1.11.2.1 Hawaii Island

IGP Consideration	Takeaways
Time	Concerns regarding existing and future battery storage as it ages
Affordability	Support for decisions that result in lower customer rates
	Explore subsidized rooftop solar programs for businesses
	Support for affordable home battery storage programs
	More likely to install rooftop solar and/or using electrical vehicles if: Rooftop solar materials and installation were affordable The power credit system was clarified and improved Incentives were provided by Hawaii County
Land Use	Support for expanding rooftop solar efforts for both residential and business buildings
	Support for expanding electrical vehicle charging stations
	Support for using existing infrastructure Unused golf course on the mauka side of Ali'i (was part of Kona Country Club) Solar canopies over parking lots
Community	Support for partnerships with landowners, Homeowner Associations, property management companies, renters, farmers, etc. to expand rooftop solar
	Support for partnering with Kamehameha Schools Trust to place renewable energy projects on unused land
	Avoid placing renewable energy projects in residential areas
Resilience and Reliability	Interest in other generation methods like hydrothermal, geothermal, nuclear, biofuel, etc.
	Avoid volcanic areas that could destroy potential projects

1.11.2.2 Oahu

IGP Consideration	Takeaways
Time	Dissatisfaction with the recent retirement of coal plants due to higher bills
	Requested assistance and support from Hawaiian Electric to replace and/or refurbish roofs and solar panels as they age
	Concerns that government (state and federal) and internal Hawaiian Electric structure will be too slow to achieve 100% clean energy by 2045
Affordability	Support for decisions that result in lower customer rates
	Support for rooftop solar incentives Community buy-back programs Grant programs Programs for lower-income residents Subsidized re-roofing/re-paneling
	Support for electric vehicle incentives
	Better rates for electric vehicle owners who charge during non-peak hours at home
	Benefit for businesses who install charging stations for employees
Land Use	Avoid placing renewable energy projects near significant cultural and environmental sites Diamond Head Waipio Manalua Maunaloa Kāneʻohe Bay
	Support for discussing and collaborating with communities regarding potential wind turbine placement
	Support for using existing infrastructure Solar canopies over parking lots (ex. Kaiser High School and Hawaii Kai Golf Course) Solar panels on Rail Guide Way Retrofit retired fossil fuel generation plants for long duration energy storage
	Support for expanding the amount of electric vehicle charging stations available and plug types
	Community
Concerns that lower-income communities will be most burdened	
Support for community benefits packages for project-hosting communities	
Resilience and Reliability	
	Concerns that a grid reliant on solar and wind generation will be at risk in times of unideal weather
	Concerns regarding the physical and cyber security of potential micro and grid-scale projects
	Dissatisfaction with the recent retirement of coal plants due to outages and inconsistent reliability

1.11.2.3 Maui

IGP Consideration	Takeaways
Time	Concerns regarding the plan for aging battery storage
Affordability	Support for decisions that result in lower customer rates Support for incentives for clean energy choices Tax credits for energy efficient windows and doors Option to buy back electricity from individuals and businesses with solar panels and battery storage Programs for homeowner/homestead sized windmills Concerns that rooftop solar systems are too expensive for the average person/household
Land Use	Support for potentially new or expanded infrastructure in Central Maui to preserve other land Support for expanding electric vehicle charging stations Support for using existing infrastructure
Community	Support for a partnership between the agriculture community and Hawaiian Electric to produce mutually beneficial projects Avoid placing renewable energy projects near significant cultural and environmental sites East Maui, specifically fishing grounds Hana through Kaupo Haleakala down to Hi-Performance Center South Maui Waihe'e Honua'ula Mauka Waiehu Makena Nu'u
Resilience and Reliability	Interest in other generation methods like harvesting methane, wave/tidal/ocean technology, hydro, and nuclear Concerns of isolation and outages, especially in times of emergency

1.11.3 REZ Comments Collected

REZ Comments Collected
Maybe South (or East) Big Island are good options for future large-scale investment because land is still relatively cheap and there's lots of sunshine. Oahu island is fast becoming urbanized everywhere as well as Kauai and Maui. Many lower-income residents on Hawaii island move out to the Hilo-Ocean View side because costs are now too high in Kona, Kohala, Waimea, and Hamakua. I don't think there'd be as much pushback for new projects as this is one of the last places in Hawaii that have yet to see any kind of major development. If future large energy projects were brought there, it could be a great economic boon for the people in that area. I know the Big Island well because I grew up in Kohala and we own homes in Kohala, Hilo, Kamuela.
Away from population but closer to the load growth. Try to find areas that won't disrupt anyone.
Away from population but closer to the load growth. Try to find areas that won't disrupt anyone.
So much rain on hilo side
If area can actually work with should develop; at elevation but flat and no one will see it
Away from residential areas. Open areas in general, not specific
Picked zone 2 because high potential (360 mw) and lots of space for solar
Land available. Open range to put solar or wind good wind coming down from mountain
Open land, not big need for pasture land
Put more windmills
Avoid residential areas in general
Avoid residential areas - like Kahuku Wind Farms
Avoid volcano areas because eruption would destroy the solar farms
Hakalua waimea area. Land availability avoid areas where lava has flowed
Puako and Waikaloa good places f/solar
Puako and Waikoloa good places f/solar
Everyone should pitch in if it benefits community need more solar because my bill doubled I like in Honoka'a, build more there
good area for solar
Avoid Waipio for large scale - cultural, mana'o + avoid Manalua and Maunaloa
O'okala? Okay
More wind in Waikoloa + happy to see more solar
Kohala good wind zone won't bother anyone
Good resource to have solar. Thought there were [WORD] about developing project in the area
Not healthy with all noise + Kapuna so put proj. away from them
Solar in Puako, want the proj that dropped out - land is dry can't be used for other things
Born + raised Honokaia - community solar or wind ks land
Open land + sunny. Can't do much else w/land. low cattle carrying capacity
Should have never shut down a coal fired power plant without something in place first. I guess the general public shouldn't expect anything less from a Biden administration.
Nothing is wrong with turbines, but they must be properly sited; in Kahuku, the turbines were placed too close to the community. Based on research of other wind energy projects (Germany), it's understood that wind turbines are located at least one mile from the nearest residence or farm. Should be learning from others to incorporate the best technology and information regarding health impacts. Would like to see wind turbines at the State Capital, Department of Health, and City Hall; they should have to live with the wind turbines as that is what the Kahuku community has to live with 24/7. If people aren't willing to put the wind turbines next to a high school in Hawai'i Kai, they shouldn't put them in Kahuku
A lot of wind in the back of the valleys. Wind in the valleys on both sides of the island, may be difficult to get transmission lines across the mountains. Wind turbines could be sited in the middle between the mountains, as there are no residents in this area and the turbines could serve the populations on either side. Investors may not like that but may be a long-term solution for wind and even solar energy projects
Houses should be required to have solar photovoltaic systems with lease programs or other arrangements that are user-friendly and affordable enough to allow for system upgrades
Development will continue which will occupy a lot of open areas shown on the REZ map, so renewable energy projects should be sited as far back as possible from these areas, in the middle area between the mountains, away from schools and other development
Pacific Heights area is very windy, not sure how to capture that but it funnels through the valleys
Communities need to be engaged for renewable energy solutions, especially those underserved/underrepresented
Supportive of horizontal turbines
Potential for rooftop solar in Honolulu and Pearl Harbor areas, especially on high-rise buildings based on discussions about allowing solar panels to exceed max building height limits. Desire to maximize potential on existing structures, rather than raw land (discussed at West O'ahu/Kalaeloa Clean Energy 'Ohana)
REZ not including Honolulu and Pearl Harbor is excluding a significant amount of resource potential

REZ Comments Collected
REZ should show potential for rooftop solar in addition to large-scale projects, so equity across geographic regions can be taken into consideration. Could also encourage rooftop solar and other small-scale projects
Energize Wai'anae program (part of Solarize 808) will be rolled out in the Wai'anae moku starting Nov 2022
Fair, not necessarily just equal, and pono distribution across ALL communities
Designing tech and systems for high rises and town areas
There is a lot of open space between Kapi'olani Community College and 22nd Avenue; much of this area is associated with the Dept. of Defense and could be a good place to site solar energy facilities
Area around the airport is worth considering relative to ensuring food availability
Consider including technologies like micro-hydropower with dams and pumped storage hydro facilities, which are ready for implementation
East Honolulu should be considered for future wind projects
Grant programs to help residents fund rooftop solar projects are valuable
Incorporate legacy infrastructure on the North Shore, specifically the network of former plantation irrigation infrastructure (such as reservoirs, canals, and channels) for hydropower
Dole is currently unloading much of their infrastructure, which is critical to the water supply for North Shore's agricultural community. This could also be used for micro-hydro power
Hawaiian Electric could coordinate with the developers who're planning to add multiple affordable rental housing units in Waialua. This collaboration could encourage developers to incorporate elements that're beneficial to microgrids for example
Put wind in East Honolulu next
To address impacts to farmland, solar panels could be added to urban and other built spaces like Windward City Shopping Center and Castle Hospital
There may be geothermal resources in Ko'olaupoko
Proximity to Ko'olau Substation so that the resource can flexibly support the most electrical circuits possible at the lowest cost and complexity
Solar photovoltaics on state and county facilities like the Molokai public library
Multi use land, all parking lots, warehouses, state and county facilities
Utilize brown fields. Partner w/public-private surface parking lots. DO NOT TAKE AWAY ag land or commercial mix use lots.
Wind turbines are controversial and should be discussed with the community
No windmills should be as close to homes, schools and farms as the monster turbines in Kahuku are. Appreciate early community involvement.
Are horizontal wind turbines less expensive than vertical? How well do they tolerate salt air? No solar farms on agricultural land! No vertical wind turbines!
No vertical wind turbines! Horizontal turbines are okay
Completely against wind turbines
Diversifying the kinds of renewable energy and not just place such a huge focus on solar
Finding technology that takes up less land space and has a smaller footprint
Concentration and permeation of projects within a defined geographic area (identify threshold to manage number of projects, whether large or small)
Physical security, cyber security, and accessibility for repairs such as large transformers
Are the areas of highest potential to host large renewable development be given highest priority usage of that resource? Or will it be sent to the higher usage sites? Example: Will Wai'anae and North Shore side who have high land potential be given higher priority usage over Waikiki (who is a high energy user)?
Do you see your prime prospective locations for large renewable development and microgrids competing with sustainable agriculture plots and prime farming locations? Will you be willing to relinquish prime energy development locations and allow diversified sustainable agriculture to take the spot?
Many communities have to bear the burden of hosting new infrastructure without real recognition or reward
The neighborhood board tends to be concerned about siting anything on Diamond Head
North Shore Sustainable Communities Plan is currently being updated; the community does not support wind turbines, especially offshore wind turbines
No more wind on north shore
Kāne'ohe Bay is a unique natural and cultural resource so should not become used to site any generation sources
No solar farm at Nankuli Ranch
No wind farms at Palehua
Put near landfill. Harvest methane and utilize it instead of just burning it off. Is there enough, though? More solar and battery projects. D.O.T. will be needing to charge buses down the road. Looking for areas with a lot of wind. Have you considered wave and ocean technology?
Been in Lahaina during fire, storms.
Water can be a good source of electricity. Green on Haleakala Hwy near truck off-ramp, opportunity for wind power. State DOT owns property there. Look at battery power opportunity at Kahului.
West Maui – solar; more generation there...
North Side – wind
Harness methane gas at the landfill to create power; not sure about the sustainability of a project like that.
Curious about wave technology.
Focused on central valley area because of the population density there; best bang for your buck
Near Maalaea Power Plant – close to infrastructure and serve as fire break.
Potential for every area to be isolated during outages, especially west side and Hana, so distributing the energy would be ideal
Experience with west side being isolated during emergencies and agree with having power out there
Lands that are able being developed or have been disturbed by former ag use

REZ Comments Collected
There are hydro opportunities. There are families who have worked really hard to get water back, so I would urge caution. Not the kind of hydro you're thinking about, there are new opportunities. Honokohau is one of the most powerful hydro opportunities. There are community members who have their own personal hydro, need to consult with the families there.
Put green dot by the dump.
Potential in the 700 acres of Hawaiian Homes Lands upcountry.
Ukumehame – the land has been decimated; maybe solar could be used but as long as it doesn't add to the negative affects already being seen in that area.
Hana has two generators to keep power on. We can convert them to biofuel.
Are we considering other resources like ocean/wave tech
High wind potential in the Kaupo area, near the existing windfarm
East Maui – in terms of resiliency, would make sense to have a resource there
Mokulele Hwy – East of the highway, above DHHL lands and heavy industrial zone, may not be usable for anything else and possibly high potential for solar
Behind the Kihei Baseyard, not highly visible
Central Valley, already developed and centrally located
Launiupoko, possibility for wind
Near Kaheawa Wind farms, already disturbed
Above Olinda, downslope of Haleakala
With the seabird work that I do, there is an important pathway for ua'u. Put the green dots in central Maui where there's already a lot of infrastructure.
Green dots in West Maui, good potential for wind and solar.
Putting up turbines or solar in Central Maui wouldn't bother me, but beyond that should stay untouched.
Central Maui has a lot of potential for development or re-development.
Hydroelectric, wave, ocean technology
It has to be many approaches, it can't be just one technology. Met an ocean/wave technology person on a plane 20 years ago and he had me convinced that ocean technology could be a good thing.
A lot cultural sensitivity, but also not a lot of transmission going out there. It's an opportunity there, though, because there's a lot of land available.
We can see where people are okay with projects, in the Central Maui area.
Iao Valley/Wailuku – Rural area right next to the center hub of government
Central area, so much potential for development/re-development, especially in places that are sitting vacant
Ocean/wave technology potential
South Maui - since the study identified it as a good potential, it may be worth looking at
Green dot in Waikapū, North Kihei, and other site in Central.
Large agricultural land owner has plenty land. Need a partnership with MECO to build projects that Large agricultural land owner can monetize. There are beneficial partnerships that could happen, but that's above our heads (those in the room). There are lands that were excluded in NREL's study. A lot of land in Lahaina won't be farmed again because of water, so those ag lands are opportunities. Cost-prohibitive to farm in Lahaina. Some Class A ag lands are worth re-visiting to see if they can be included in future RE plans.
Need to go to County Council with a plan, prove that the ag land in Lahaina is not farmable, no water, too expensive. Tell them that energy is a form of ag. HECO is allowing the PUC to cause energy sprawl. Ag designation needs to be changed. The powers that be don't always know about the issues. Sugar was grown where it was because it was crap land. Would never grow anything in North Kihei except for kiawe. Waikapū Town planned development wants to build a new wastewater treatment plant, add Mā'alaea. Can pump the millions of gallons of water uphill and then create energy when it goes back downhill?
Methane gas from pig manure; should be capturing methane from landfill
Wave technology, needs to be scaled
Waikapu, North Kihei (Large agricultural land owner) why wasn't that land used before Kuihelani Hwy
A lot of ag lands in Lahaina will never be farmed again because there's no water – Large West Maui Ind owners: This needs to be taken to the council and prove the unfarmable lands so the classification can be changed
Major sewage plant in Maalaea - Pump the water uphill, install hydro, create a lake, if enough water you can supply Large agricultural land owner, or the water from the lake can replenish the Iao aquifer
Kaupō has great wind and solar potential, but it's far from transmission lines.
Put green dot where Mokulele Highway where Humane Society is, there is a heavy industrial area near above where Hawaiian Homes wants to develop. It's dry, no water, there's nothing around there.
Put green dot in waihe'e, waiehu area. Lots of wind potential.
East Maui is very cloudy, also high in cultural resources. There's wind there in certain areas.
Potential for every area to be isolated during outages, especially west side and Hana, so distributing the energy would be ideal
Concern would be for Hana, lot of sensitivity there, don't recommend putting anything there.
Have had a lot of issues with wind and snow, power has gone down there. It would be difficult to bury cables there.
Cultural and jurisdictional sensitivities from Haleakala down to Hi-Performance center.
Avoid Pali due to fires.
Kapalua airport area due to aircraft approaches, FAA requirements. FAA put a six-mile radius around the airport for them to monitor.
Hana has culturally sensitive sites.
Summit – lots of jurisdictions operating up there.

REZ Comments Collected
Ranch lands. Whatever happens up mauka affects the ocean, that would be my concern. A lot of birds travel makai to mauka in that location. There are a lot of birds going makai from mauka in the morning.
South Maui has one of the densest cultural resources.
Waihe'e because of cultural significance.
Honua'ula – worried about the desecration.
Maui Lani area because of 'iwi kūpuna.
Central area due to a lot of conservation area, same thing with Hana. Need to protect those areas. Lahaina already has a solar farm.
East Maui/Haleakala – Franco: protection of our natural environment
East Maui – density in Hana is very low so its hard to envision large projects in that area
West Maui Mountain area – should protect watersheds and natural environment
Haleakala – caution because of historical significance
Haiku, road to east, probably not suitable for solar
Avoid airport
Avoid Mauka areas due to cultural significance, terrain, and protected habitats
Avoid East Maui
Avoid vistas of Mauna Kahalawai
Kahakuloa/Waihee coastlines should be avoided because of sea level rise and possible iwi
Kipahulu Biologic Reserve and Haleakala Wilderness Area
Waihee/Waiehu, very windy but also lots of cultural significance
Makena – lots of archeological sites
Hana thru Kaupo – last untouched place on the island
Anything on the coastline is going to be difficult, shoreline/beach access.
The central area, along Veteran's Highway, is prone to wildfire. Look at what happened in Kahoma Valley, Lahaina, during Hurricane Lane. I didn't see or hear vulnerability mentioned, is that a factor?
There is a lot of unused land up mauka that catches a lot of sun. As long as we're being respectful of future housing sites, cultural features, etc.
North Kihei area has had a lot of negative impacts already.
Upcountry/Makawao, grew up there when it was still paniolo days
Top of Mount Kahalawai; wind farms are an eyesore, dirt roads created sediment into Maalaea Bay. Did the benefits outweigh the cons. We should avoid mauka development
Haleakalā as a caution area.
Cannot put any resources near the airport.
Fire caution, conservation land, wet terrain. Mostly mauka-oriented comments.
Whenever anything goes up behind the mountain, it's never a good thing. Cuts off access to fishermen, becomes a place for tourists, impacting sacred land.
Grew up in Lahaina where there was a lot of ag. Have a lot of challenges there, it's an island by itself.
Kula, historical area for ag
All of East Maui. – Fishing ground, no transmission lines out there, aesthetics
Too much cloud cover, not good for solar.
Nu'u – large boulders from ancient times.
Waiiauku'u (Waihee) – familial generations of taro patches/farming
The input of the solar farms are a great idea- one major item to consider for all of solar is how is it going to be maintained to keep the system making the energy it is supposed to be making the whole time. There are a few companies dedicated to doing such work on the islands but this should be supported further and for open discussion.
If you drive the cost of electricity so high that it becomes unsustainable, all effort toward clean energy will be useless. Yes, pursue clean energy options, but do it in a way that puts the burden on HECO and the state of Hawaii, not on customers who are already stretched too thin paying energy bills.
I love the idea of more solar panels. I would like to see incentives given to businesses and homeowners (including condominium buildings) to add these to their structures.
Alternative energy sources are not reliable and are more expensive. In addition to causing more harm than natural gas. The last few days in Kaneohe and windward side cloudy and rain so good luck if you are dependent on solar. Wind energy is not efficient in producing and transferring electricity to the grid.
We have a large solar system. Because of our conservation efforts, last year we generated \$1,900 more electricity than we used. We were not rebated any of this amount. When I called your office I was told since we are a residence, not a power generator, no refund was available. They suggested we USE MORE electricity if we were concerned about gifting energy to Maui Electric. This seems counter productive if you need the resource.
I love this idea! It's called the WINDWARD side for a reason! Let's use it!
A lot of homes in Diamond Head/Kapahulu/Kaimuki are serviced by underground power lines, and HECO's requirement that homes be upgraded to 200 amp service in order to install residential PV makes installation cost prohibitive due to the cost of digging etc for this upgrade. If 200 amp service wasn't required for residential PV, then less space is needed for utility solar projects due to decreased demand
It would be amazing to have large gyms in HPP, Fern Acres and Hawaiian Acres/Beaches, Pahoehoe where the equipment is powered by the people using the equipment that would be attached to battery sources that Hawaiian Electric could capture to distribute to the area homes to help cost containment. Gym would be equipped with solar power as well.

REZ Comments Collected
There is a lot of untapped potential for solar panel placement on residential roofs. Not just in Pearl City but statewide. HECO should develop strategies to make use of this resource, possibly using partnerships with homeowners where their out-of-pocket costs are minimal but the energy generated by a distributed network of installations helps the surrounding community.
I have a recently installed rooftop PV system with battery storage. On very sunny days, my batteries will be full by noon and the system will stop storing energy. The system then stops producing electricity, even though there is plenty of opportunity. I would be happy to donate the additional energy that could be generated back into the grid to help reduce the demand on the grid, but that doesn't seem to be an option. I understand this is because of the limitations HECO places on PV systems.
As a renter, I feel felt out of this process and at the whim of my landlord.
The cost of my power bill has jumped \$300 a month I don't have A/C I put in brand new water heater got rid of my extra fridge and cut everything else back as much as possible and I am paying \$700+ every month
Continue to turn trash into power by expanding the power project to burn the thousands of pounds of trash produced on Oahu into energy. This not only produces energy but also reduces the incredible trash problems and landfills taking up space.
We need more EV charging stations operational on Maui There should be operating stations at shopping malls Too many of the stations are closed Mill house. Ma'alea harbour. Kulamalo. None at Maui mall
We have solar panels on our roof and I challenge my neighbors to do the same.
Solar on roofing in Kailua represents a huge potential opportunity given the high amount of sunny days and the lack of large trees or mountains close. The biggest challenge is affordability for most people should consider Hawaiian Electric renting roof space, etc
We are installing 30 panels and 2 batteries to help shoulder the load.
Hawaii Kai Golf Course has a large, flat parking lot that could accommodate solar panels. The panels would shade cars and keep them cool while golfers are using the course. The parking lot paving is old and crumbling. Perhaps a partnership could be made: new paving in exchange for using the space over the parking lot for solar PV?
Hydrothermal utilization and wind is important as alternative forms of energy.
Sun most days
We have solar PV, it would be good for all to be able to add tesla batteries to stabilize the grid and provide for power outages. A recent quote requires additional panels added to use batteries, or I can add batteries, but they aren't part of the grid, so no environmental benefits for all. Would be good to be able to add battery storage to our home.
Can the interior area of the crater be used for PV panels?
Palehua Community
the large amount of vacant land above the Pulehunui industrial area (southeast of the Maui Humane society) would be a supreme site for a large solar farm. It would be near power lines, near to the location where the State and Hawaiian Homelands are planning to put in a large number of facilities, and most importantly it is an area that receives a very high level of solar radiation with limited cloud cover.
Website that shows power outages as well as updates. Calling in during outages doesn't work. A single website linked to social media would help all. Could be automated as well. With power outages, most customers have cell service for sometime, so this would help all.
PLEASE stop the ridiculous activities that are RAISING our electric bills
There is an unused 18 hole golf course on the mauka side of Ali'i that could make a great solar farm. Was/is part of Kona Country Club courses - now going to waste & overgrown. Connectable to the grid.
The anti-solar rooftops attitude and practices of Hawaiian Power is an insult to the utilities approach to solving social challenges. When I fly over Oahu and Hawaii islands I'm flabbergasted about the lack of rooftop solar. I have tried to expand my current investment in our energy challenge and there is more resistance from Hawaiian Power than the County. I have not heard one word on how we can improve this number but many reasons why we cannot.
You work a sheltered market. Live up to it's mission.
Allow rooftop solar with net metering. Don't force us to use a third party like sunrun and stop putting solar farms on arable land.
These clean energy initiatives are not only costing us more in electric bills, but are also horribly misguided and poorly implemented. We won't even dream of building a nuclear power plant (The cleanest form of energy technology available currently) or even building an infrastructure to recycle solar panels.
Water Generator. Think about it. Water flows from Kahanua Valley through tunnels built in the 1890s by mcccandless brothers to feed water to sugar fields on the leeward side. But, water flow to Waiahole valley provide taro fields, tenant's, etc. can generate electricity with Down flow instead of pumps. I'm not an electrical engineer. But a system can be created Hawaiian Electric engineers. Electricity from created by water generators can feed to our grid. Thank you. A feedback is requested.
Why do we have the windmills so close to schools in the city of Kahuku
Why do we have the windmills so close to schools in the city of Kahuku
Re-establish energy buy-back programs to foster more solar development, and encourage existing solar customers to participate. This might discourage the practice to "go off-grid" once a home's batteries are fully charged if excess solar power is being produced, because the current compensation structure offered by Hawaiian Electric does not sufficiently benefit the homeowners, who have invested significantly in clean energy. Energy companies on other regions offer much fairer opportunities — why can't HECO?
How can residences who live in condos and townhouses, who share roof space, take advantage of solar/PV energy savings? With all the current renewable energy resources where is the savings going, to the residents or HECO? Can fuel cell technology create electricity?
Energy storage is critical. While batteries at individual homes are important (I already have a Powerwall), infrastructure storage is necessary. With all the land available and water from rain, a water fed gravity energy storage system could make a lot of sense. There may be better places on the island.
Don't put solar in natural areas, only on buildings and parking areas. Otherwise the solar will ruin Hawaii's natural beauty and wildlife. Also many areas are already saturated with solar. They produce too much energy during the day and none at night. We need large scale energy storage otherwise we will never

REZ Comments Collected
reach the 2045 goal. Also stop making goals that are so far into the future that all current politicians will not have to be held accountable for them. Have realistic short term goals instead.
Not just in Hilo, but over the entire island, parking lots should have solar covers. As we need more electric car charging, this can help facilitate the powering of the chargers.
Net Metering. Pay the same rate for electricity from private PV systems that you charge and the need for larger projects will be less.
Given the volcanic activity on the island, is there any way we can use the geothermal energy to steam water to spin turbines to produce power?
Need to upgrade the grid to return power credits produced by solar homes to the homeowners in a more equal way. I understand cost verses credit, but it is hard to get behind a company that doesn't provide much back to the people that pay for it.
Excellent Choice for solar!
Where are all the depleted batteries going? Are children being used to mine Lithuim in Africa to provide this means of "clean energy"? We also know its cause fires. Its a lie. Have a good day.
There are medical offices in Hilo with solar panel installations installed in parking lots to provide covered parking spots for the staff and patients and electric power for the grid. If this makes economic sense for their businesses, it should make sense for our entire community. One of the smallest benefits would be a public relations win for Hawaiian Electric. Please investigate this option before using precious agricultural land that most local residents can no-longer afford.
Clean energy i ls no more than a talking point right now and climate change is just a hoax and a way for Hawaiian Electric to raise rates and local governments to increase taxes
I have a PV with a NEM agreement. I want to expand as I have more space on my rooftop, but the process is difficult and I am limited to how much I can add. If a homeowner has a NEM, we should be able to expand to the rooftop limit to be able to contribute to the grid.
We installed a Tesla wall so we could take advantage of the money back program. it has been almost a year, now, and we still gave not received any monies back from this program which HECO endorsed, advertised and encouraged the public to be a part of. Please, 1) explain why you have taken so long and do not say there was a long list of applicants. That is not an excuse. And, please, remit and honor your promise. You can call me at 808 292 8903.
Installation of level 1 chargers to allow for EV charging during peak solar production hours at work sites as people are unable to take advantage of lower rates or solar production.
Instead of utilizing so much limited land for additional solar structures and wind farms, partner with property owners to utilize their unused solar footprint on their home's roof would be a more ideal way to use space. Yes, there are plenty of challenges with adding solar to homes, but if the state wants to really be proactive in improving going renewable, they will make the process easy, available and not a money grab opportunity. Fiscally it is difficult for most home owners to get solar, but if there is incentive of co-sharing costs such as renting the space from then in the form of payment in electricity, etc. It's a win for the community and a win for the home owner. There's more to be said about this than this little space, but developing on green land for wind and solar farms seems to be an unnecessary use of limited space resources. Maximize the use of the space already developed and show the world how it's done right by working as a community.
Ideology is not good policy! 100% renewable in Hawai'i is not going to make a dent in "saving the planet." There are clean solutions that are affordable, available, and can meet demand. Solar and wind are none of these! They work to an extent, but cannot be the only solution. Use actual science and engineering to help Hawai'i residents enjoy living here. That is your job! This has become a tourist state, but the residents are still paying for it!
I would love to have renewable energy options
Limited number of EV charging available within this commercial zone
There should be an incentive for those with solar to save electricity usage, because as it stands, users are actually encouraged to use more in order to reap monetary benefit. There is no financial gain or savings when we produce extra electricity. The only way to reap any benefits of the credits we earn is by going over what we produce. When I first moved into my home with solar, I asked around other users to understand how it works. The advice I was given is that if I'm used to using very little electricity and always produce extra, then I need to crank it up sometimes, like leave the a/c on, so that I'd go over what I produce, use up my credits, and pay even less then the service fee. I don't understand how come we don't get anything whatsoever for the energy that we produce for HECO. Even if we get a small percentage of the profit from what we're making for HECO, at least it would be an incentive to use as little electricity as we can, even with solar, which equates to producing even more.
100% renewable is not feasible and will cost more than you believe you will save. It is unattainable for the majority of people. You are placing a huge burden on the bottom of the income bracket
Regarding large solar projects on former Ag land; If ground mounted (bifacial) solar arrays are raised 6 to 8 off the ground, they can provide shade or partial shade for new Ag opportunities that could be very efficiently drip irrigated and provide low water use and very low evaporation for suitable crops such as strawberries, many lettuces and herbs such as; Shade-Tolerant Vegetables and Herbs: arugula, endive, lettuce, sorrel, spinach. collards, kale, mustard greens, swiss chard. beets, carrots, potatoes, radishes, rutabaga, turnips. Broccoli and cauliflower, brussels sprouts, cabbage. mint, chervil, chives, coriander/cilantro, oregano, parsley.
Residential townhomes have a limited access to PV/EV amenities. Shared roofline limits the amount of EV panels per occupant. Not sure about available options through HECO.
Residential customers should have opportunity to add, expand, or modify solar panels on their homes with ongoing incentives and without adverse consequences like having to modify their customer agreements that negatively affect them. Battery systems are neat, but not the solution to help the whole community or help the grid. The grid needs to be updated to support more solar and allow those who want to add enable them to. New construction or remodeling also should mandate solar with incentives.
The solar farm you are installing at the base of makakilo is a giant destruction of plant life and waste of our precious land. You should be installing them in parking lots and areas that are already paved over. What is the point of renewable energy if you are killing acres of plant life to install it?
This would not be a good location.
Major power production equipment should not be located within the limits of the Sunset Ridge community as indicated by the placement of this marker.

REZ Comments Collected
Additionally, solar pannels and wind turbines should be located where they will not negatively impact ocean views or unique locational values of ajacent residential properties.
Wind turbines should NOT be near schools or residential areas. These are highly undesirable in Kahuku and have negatively affected the community around there. Would strongly oppose more turbines on windward side unless in remote areas
Frankly, I agree that the coal/oil fired plant in Campbell should never have been shut down. Solar and wind are fine when it works but it's not 24/7 reliable. HECO should've invested in building a nuclear power plant in Campbell as it would allow all other plants to be shut down and have ZERO carbon footprint. Nuclear is VERY SAFE today as it's been 2 decades since the U.S. built a new nuclear plant. Hey, if the City can spend \$12 BILLION on a stupid rail, it costs less than that for a nuclear plant that will fill the needs for all Oahu's electrical demands for decades to come. Even the smallest plant has more available capacity than Oahu currently demands (even without solar & wind supplements).
Wind farms are run by electricity. I thought the purpose of wind farms was to use the wind we get naturally to help provide power. Wind farms barely pay for themselves. They are expensive, interfere with birds, and barely contribute. If you want wind power, let the "wind" power the mills, not electric. They don't make sense.
Good idea
Why is the price per KW different everywhere? Is Hawaii's electricity so much better that it costs more? Is the price per KW for electricity in Ohio less because the "quality" of the electricity produced is not as good? Noooo! Electric is electric. It should cost the same across the board. Power companies stop being greedy!
Please stop taking away agricultural land! Get Monsanto out of Hawaii!
Quit taking away agricultural land and we will be able to have plenty of food! We need to bring back a few dairy farms so we can produce our own products here on the islands.
Good idea. Do not take away people's freedom of choice in the process. If people want to be off the grid let them.
Noooo! It isn't worth it! If you want to use wind power, let the wind that naturally happens power it. Why are the "wind" mills powered by electricity? Makes no sense, they barely pay for themselves, take away from the natural beauty, and birds are dying because of them.
In my view it is important to stop wasting green energy which is already produced: I have a photovoltaic system with batteries, but when the batteries are full the photovoltaic system must stop producing energy because HECO does not allow my system to output that excess production to the grid! I would not even expect to be compensated for that energy, I would just want to stop the waste, and I am sure that many new photovoltaic systems are in my same situation.
Please stop destroying Maui's beautiful landscape in the name of climate change. You will destroy one of the most beautiful spots on the planet with ugly wind turbines and solar panels, and the climate will continue on its path.
Kamehameha Schools Trust (KST) has thousands of acres of property tied up in low revenue, methane emitting cattle leases all over the Big Island. What about long term KST leases for renewable energy production that would benefit KST, Hawaiian's education and the public at large? Ag land use and renewable energy use are not always mutually exclusive. Does KST --given that they are fundamentally a product of co opted land use --have any desire or obligation to give back to the planet and indigenou peoples who have no access to their schools ?
Until you can Figure out a way to Lower my bill this is Useless. My KWH have been the same for years, and my bill has been The same, Now that the Coal plant has been shut down, My Monthly Bill For the SAME KWH has Almost Doubled, And For what? Heco Made Millions in Profit, and yet we the People who made you Wealthy Suffer.
Wind turbines destroy the beauty of Maui's natural landscape.
Land South of and surrounding Community College has ample empty space and access to electric grid from existing power plant accross the Queen K highway from the airport. Looks like some development directly North of the college is in early stages, perhaps could be a coordinated development opportunity for solar power facilities.
While I'm not in favor of wind energy, especially anywhere near populated areas, I believe solar panels should be placed on every single public building possible (schools, government buildings, etc) and over parking lots (covered parking).
Solar/wind generated electricity should only be backup sources. Since Hawaii/Pearl Harbor/Hicham are home to the Pacific Fleet ALL ENERGY resources should be available for our strategic defense.
My KWH have been the same for Many Many Years. Now My KWH are still the Same and My Monthly Bill has almost Doubled, Yet Heco has the Nerve to Post it's Millions of Dollars in Profit. Seems like this is only helping Heco
Geothermal should be pursued on this island as it is the least intrusive on the environment and requires less outside inputs.
There are abundant opportunities for renewable energy projects in Puna—only each project will need security alarm systems and cameras to deter criminal activity. Susedized Solar on business roofs for a start.
Methane gas burn off from our refineries is energy going to waste. Hawaiian Electric has been stubbornly concerned with the bottom line than with customers. Until all the refinery burn off is used to fire our boilers to create steam and hence electricity you are wasting energy. The product of burning methane is O2 and H2O. Compare that to the carbon foot print of just one windmill.
Closed loop pumped storage hydro power can be a great solution for storage of intermittent renewable energy production (wind/solar) and a more cost effective and environmentally friendly alternative to battery systems. With the natural slopes on Hawaii Island, it seems that these systems would be possible storage solutions and reduce the need to rapidly switch on/off power generators at the fuel oil plants to balance inconsistent renewable power supplies (wind/solar).
In 20 years you expect to go completely green? Impossible, schools are billions of dollars behind in updates and renovations, now they have to go green. How are millions of homes, condos, and business going to go green. Who is going to pay. Will Matson and airlines who bring in all our essentials going to solar and wind power? Will new rail system be updated to run green? Who will pay? Will all our truckers and delivery people going green? Who pays, etc. etc????
Apparently no solar company wants to help off grid areas such as those in Nahiku because they are most interested in making money off of selling electricity they make off your roof back to the grid.
Start looking into putting power lines underground, at least in areas affected by wildfires often, wind and cause mass outages like down veterans highway to kihei
Why did our electric bill go way up after the so called smart meter installation?

REZ Comments Collected
Subdivisions along Hwy 137 (i.e. Kehena, Puna Palasades and Seaview) are on the sunny coastline with ample homes that can and do offer rooftop solar PV. Please improve the ability for residents to have grid-tied solar PV systems by upgrading the grid infrastructure for these subdivisions. Many residents in this area have resiliency practices already, so may choose to have onsite battery storage for their solar PV setup. Hence, there are opportunities for distributed energy storage as well as excess solar PV feeding into grid to contribute to upper Puna residents who have less solar opportunities (e.g it is more cloudy along the east rift zone than in the Kalapana coastal area.)
Kihei, Pukalani and Wailuku are full of developments, start working with Hawaiiana and other developers for solar roofs and green roofs with subsidies or incentives so that these complexes become more self sufficient.
I agree with an existing comment that panels over the parking at the Hawaii Kai Golf Course has great potential
Geothermal done "right". When our oil supply becomes compromised, as one day it surely will be! Out of luck!!
Work with animal farmers and keepers for solar panels on ground - generate energy and provide cooled areas for animals to rest. This can be taken to bus rest stops as well. Many bus stops on maui are uncomfortable, hot and sunny. Work with the county to beautify and functionalize rest stops to improve use of public transport and generate power.
Incentive HOAs to install "community" solar on building Rebates to individual residents or HOA to encourage solar installations.
Offshore wind!
How can our Haiku Point condo(200 apts) have Electric Vehicle recharging stations installed within our grounds, to each carport and parking space? Is there a pilot project we can volunteer for?
It's unfortunate our city council did not think this out better. Rather than eliminate the Kahi plant, but do so in phases, must people cannot afford the alternative initiated by the progressives who have most of the discretionary funds. But, enact a process that doesn't bite most of the population of Hawaii. However, I do appreciate the Hawaiian Electric initiative to help the population with solar power initiative. Mahalo HEC.
I'm in favor of a well planned electric power supply system that takes into account reliability and the cost to electric customers AND taking into account of the consequential cost impact of your electrical customers, business and government which could increase the cost of living for anyone or organizations that uses electricity. Lately, there has been a lot of outages in my neighborhood. I was really surprised when HECO seemed to be NOT aware when AES Coal Plant shut down and the consequential increase of the electric rates. In the past, HECO tract cost of fuel and the impact of electrical rates in its Long Range Generation Planning. Isn't HECO still doing this study as new electric generation units are added or subtracted from its system? The cost Electric energy affects all of us so Plan and implement WISELY!
Back up power is needed for renewable solar/wind. In the next several decades it will be impossible to eliminate the need for fossil fuel powered back up generation. It's that or get ready for an increasingly unreliable grid.
the kula ag farm (a maui county project) has vacant land between the current farms as well as rough terrain areas that could support wind turbines as well as photovoltaic pannels
Many Hawaii residents have bought into solar energy. The time is approaching where roofs with solar panels will need to be replaced or refurbished. The cost of moving panels to replace a roof is crazy expensive. I think subsidizing re-roofing is more than warranted, especially as reroofing is not something a homeowner does but once every 15-20+ years. I am nearing that point when reroofing will be necessary. With my fixed income I will need all the help I can get to make it happen. Anything HEI can do to assist residents with solar panels will be greatly appreciated.
As with most of Hawaii, this area is good for Solar, not as good as the West side of the Island but still pretty good. Geothermal test plant is probably a great option but the location must be perfectly picked. Previous site in Pahoa was damaged 6~8 years ago.
Wind is an excellent renewable energy source—however the latest weatherproof turbines and the latest Plastic bird screened blades or vibration towers must be used to decrease salt damage repairs and harm to birds and bats.
Solar power companies act like its free but their contracts should all be reviewed carefully. They have some fairly nefarious clauses. If in doubt, have them reviewed by somebody, preferably contract attorney before signing!
We should do more air dry/ hang dry our laundries and use our natural sun power! It is difficult for apartment/ condo residents as most condos allow hanging laundries in lanais. Condo AOAOS should allow hang dry even the limited basis. Can HECO voice up?
Please continue to add wind, solar and battery storage as fast as possible to try and help preserve the power supply on our beautiful islands instead of relying on petroleum that has to be shipped in and can easily be interrupted at any time. Think about what would happen to our economy if the oil stopped flowing to the islands unexpectedly.
Honua Ola is a proposed wood-burning plant located in Pepekeo. The proposed plant wants to cut eucalyptus trees, burn them to generate electricity. The rate Honua Ola plans to charge HELCO. is more than 2x what solar would cost. They're claiming this is renewable but this is a lie. The trees will not be replanted because the major landholder KSBE wants the trees permanently removed. This is a challenge because community members do not want this plant and Honua Ola keeps pushing to open the plant. WE can do WAY better than burning trees in 2023!
Increase grid-tied systems to provide excess power to the system for storage/later use. Net-metering is a good incentive to motivate users to invest in solar systems.
Expand geothermal to ensure lower energy costs for the consumer. These wasteful pet projects for various solar, wind, tree burning fiascos are doing nothing to lower the cost of energy to the consumer and do nothing to help attract true manufacturing jobs which are desperately needed.
Develop micro-grid landscape for rural and remote neighborhoods. Whereby HECO facilitates installation of PV panels n residential properties and battery storage in centralized location (subsidized through grants and public/private partnerships). This would help achieve the renewables goal, along with creating resilience for the community by hardening certain infrastructure and creating redundant sources; if one neighbourhood were to be adversely impacted by an event, the neighbouring communities could divert some electricity.
Grid-tie solar systems. Net-metering was a good motivator for the homeowner/farmer to invest in solar systems.
Are you nuts? Look what has happened to other locations that have tried to go 100% renewable. Utility costs have gone through the roof. How are you going to stop that? How are you going to ensure utility costs are kept down. How are you addressing environmental impact - like killing birds with windmills and the society impact - like child labor in Africa mining rare earth minerals?
I think there is opportunity to seek other companies to compete with HECO to offer energy solutions to Oahu's residents. The poor planning and decision making of HECO and our state representatives has clearly proven, especially in the past twelve months, how detrimental the consequences of poor decisions and planning can have on locals. We need more choices when it comes to such a serious matter such as energy demands required by the state.

REZ Comments Collected
battery storage facilities needed to stabilize the grid. More roof top solar panels will help reduce demand but must be coupled with battery storage for load management.
In North America, every electric vehicle manufacturer (except Tesla) uses the SAE J1772 connector, also known as the J-plug, for Level 2 (240 volt) charging. None of the HECO fast charging locations support the SAE J1772 connector thus limiting their usefulness. Additionally, for those that can use the HECO DC fast charging stations, it's not recommended to use them more than once or twice a week, because the high rate of recharging can adversely affect the lifespan of an electric car's battery if done too often. I never see these fast charging stations in use because of these facts.
Military Installations need reduced carbon (ie renewable) electric reliability and resilience. Increased reliability for military installations offers benefits to neighboring communities when transmission & distribution is disrupted (eg lines down during a major storm). Communities should seek to partner with Installations who seek to host Generation resources to improve reliability and resilience for everyone.
How much will the taxpayers be fleeced for this?
How much will the taxpayers be fleeced for this?
I would like to install solar panels on one of my two houses in Volcano but I am not sure it would pay for itself. Volcano is often cloudy and rainy which would eliminate the solar generation of electric power. Still, since electricity is so expensive maybe it is worth the installation. Do you have some potential generation figures for Volcano?
This is the community lot for Fern Forest. This is a ever growing community that could use more infrastructure
This is the entrance for Fern Forest. This is a ever growing community that could use more infrastructure
This is Hirano Store. They used to have a gas station there perhaps they would be open to a charging station and the community nearby would benefit greatly
Could the unused land at the airport provide space for solar panels in addition to the parking areas (covered parking results).
The only way to people completely green is to be off the grid. Let people be off the grid.
The only way to people completely green is to be off the grid. Let people be off the grid.
This whole renewable energy thing is a big farce. I'm not blaming you at Hawaiian electric because it's probably being forced down your throat. In fact, I'm sure it is. This thing is never going to work plain and simple. They're just isn't enough energy in Hawaii at present to accommodate what needs to happen. Like most government programs, it will end up costing more and being of little benefit to the taxpayers
The park here has a decent sized parking lot that could be an excellent site for solar covered parking. It also is in an open area so shade is not a problem.
Nuclear fusion generator that produces power like the sun will be the best option for 100% renewable energy, but so far there are only a few start up companies working on this technology and no government funding provided to them even though they are clean and green. No radioactive waste will be produced like with nuclear fission generators, so there won't be any Toxic Avenger or 3 eyed fish incidents.
Would be possible to get more of the condo buildings in this area to have roof mounted solar panels?
For almost 40 years my comment is: NOT environmentally friendly next to a neighborhood, too near lava eruptions, Loud noise, no working monitors for emissions, no alarm and evacuation plan for emergencies but I'm sure you have plans to build more plants all the way to the ocean and destroy the peace and beauty of Kapoho. I'm also pretty certain that you will ignore my input. Please alert me for public meetings. Thank you for the opportunity to give input.
Residential rooftop solar.
Hydrothermal as long as it can be done at a reasonable cost. Forget Wind, as it seems to do nothing but disrupt that eco system and kill whales.
Based on the proposed idea of a solar farm on an unused 18 hole golf course I'm in support of this kind of local project and encourage it to move forward.
We are building a self storage facility along the canal. Over 750kw of pv can be installed. We are willing to look at battery storage as needed for grid purposes. I am the principal investor for the LLC. I am familiar with moderate sized pv systems.
Solar panels are not allowed in Hali i Kai condos.
Electric vehicles using batteries are NOT a good option...Where are folks that use batteries going to put them when they no longer work? How will they be recycled? We are on a small island. Furthermore, where does the electricity come from when you are charging those batteries? From the oil fired plants we have in Hawaii.
I installed a new PV system on my house in November 2022 but HECO still has not approved coverage for my ADU which is on a separate meter. My PV system is sized to cover both dwellings but my ADU continues to pull from the grid because HECO takes months and months to approve a simple thing like a meter consolidation. If HECO could speed up their processes a lot more people would stop pulling from the grid.
HECO needs to speed up their approval PV approval process if they want to get people off the grid. It literally takes months to get approvals through HECO.
Could add solar panels in the large undeveloped grounds of the boys prison
Could add solar panels in the large undeveloped grounds of the boys prison
Could add a small solar farm on the undeveloped grounds of the boys prison
In case of hurricane, which will destroy most solar panels and deprive families of electricity until they rebuild, Hawaiian Electric should maintain coal burning plant as backup.
The wind project that powers the water department's pumps looks to be curtailing a lot of potential generation, but apparently there is no PPA in place to allow the export of power to the grid. This project seems like it would benefit from storage, so the pumps could be powered whether or not the wind is blowing, and so that the project could provide peak power to the grid. I know that the ownership and existing operating agreements complicate matters, but amending agreements must be simpler than building a new wind facility.
Hawaii island sits on one of the most active geo-thermal resources in the world. It's stupid not to take advantage of it. Between its solar resources and geo-thermal resources, the island could be energy independent forever; it would never have to worry about running out of electricity; it could wean itself of its dependence on fossil fuels! As a home owner, I look forward to a day when Hawaii is a no longer dependent on fossil fuels.
The challenge is this strange tool. The "Solar Potential" tool shows no data for the Miloli'i area, yet NREL has LOTS of data.
We would LOVE to have solar panels. But they're ridiculously expensive. Looking to buy a RAV 4 plug in hybrid. But don't know if it's feasible since electricity is so high
Stop ripping us off with the smart meters than make our bills double
You put in the wind towers that havent done much good because the customers had to pay for that and you stop using them to charge us more

REZ Comments Collected
Had solar added and bill dropped from xx to 26. Two years later, solar is still working and it is 2x higher than before solar without AC.
Not enough electric car charging stations in or near densely populated residential areas.
Park and ride rail with EV charging would increase green transport into town, avoiding congestion. Win-win
Why are condos categorized as commercial and takes over a year for solar approval from DPP. The state wants renewable energy but puts roadblocks to people who try to do better. Let's streamline the process and make it easier so people can save money and preserve our island.
Hickam AFB doesn't have a single public EV charger on the whole base except maybe on the HANG side. Further, the base is full of large hangars, building and large parking lots that should all be covered in solar panels to power new EV charging stations and facilities. It's time to get people excited, make it easier to switch to EVs sooner, lower utility bills and help keep our island air clean.
The large parking lots of the Hawaii Kai Shopping Center, Hawaii Kai Towne Center, and Koto Marina Center rather than land could be covered with solar modules. I understand that on some days, more solar energy is produced than HECO can use to satisfy demand, so energy storage would also be needed.
Still concerns about bird interactions with wind generator blades.
Are there opportunities here for a solar farm?
ro have solar on the roof. To sell back energy that I have left over so you can sell to Co. that need it
I agree that the abandoned golf course has potential for a smaller solar farm.
Idea is great and an important component of island sustainability. However, HECO's processing and bureaucratic hassle to initiate.new pv.system is absolutely problematic and new user initiation and rebates is terrible and unfriendly to new adopters
Idea is great and an important component of island sustainability. However, HECO's processing and bureaucratic hassle to initiate.new pv.system is absolutely problematic and new user initiation and rebates is terrible and unfriendly to new adopters
Let's not charge a pv solar owning customer \$300 for "generation" and "fuel" in a month where they receive from HELCO 22kWh, but send to HELCO 25 kWh.
It still concerns me to have wind generators near the coastline where they endanger birds.
Good opportunity for solar farms
We want to be part of the solution. Our roof gets a lot of sunlight and currently have solar panels for water heating, but we would be interested in setting up an affordable solar system for our other electricity needs.
Allow the Leilani Estates Community to invest in photovoltaic cells on building tops and two of its 10 community acres to power the common areas (clubhouse, pavillion, ev charge station). This to be paid for by a partial grant and community members who invest in the infrastructure with payback of savings realized VS the existing power grid.
Big steam engine use old telescope lenses to make the heat to a turbine produce electric
There is abundant open rooftop and parking lot space all over Honolulu. It is south-facing so should get optimal solar generation.
Let's harness the ocean! Unlike wind and solar the ocean has 2 tides every day. The tides could power turbines that would power the entire ocean and it is a clean source of energy. Keep it simple. https://www.irena.org/Energy-Transition/Technology/Ocean-energy#:~:text=Tides%2C%20waves%20and%20currents%20can,use%20it%20to%20generate%20electricity.
This comment applies to all green energy development, be it wind, solar or whatever comes down the road. Please don't use virgin undeveloped land for any green energy production. Use only existing structures, preferably in already developed areas ie, existing building roofs, walls, express way medians, road beds and adjacent rights of way. All structures are disfiguring to the landscape and take a toll on wildlife. Giant wind and solar farms are a massive eyesore. I'd rather have compact scrubbed coal, hydrogen or oil than untold acres of energy infrastructure. If worse comes to worse teach people how to cut down on energy use so we need less infrastructure rather than more.
Why not install PV panels on top of condominium parking structures, they're everywhere like schools did in their parking lots. Do condo owners and renters want to contribute to this, lower their bills, of course
This entire state is prime for solar (photovoltaic) energy creation (and this isn't even considering newer tech including transparent photovoltaics) where a lot of home rooftops are still devoid of PV due to the challenge of not enough storage capacity for excess power to be fed back into our island/state locked power grid. IMHO, HECO and its subsidiaries should be prioritizing this (excess storage capacity). Why? Because more off-grid solutions are coming and economies of scale will inevitably make them feasible. I've been following RV/camping car off-grid solutions both in the US and Japan for awhile now. Ecoflow has several turnkey solutions including a modular solar generator system (you can link two Delta Pro's together along with appropriate PV panels) that I've been pricing out to see if it made sense to implement in order to just power home AC units and the refrigerators (the largest kWh consumers besides powering up the oven, dryer, microwave). Each Delta Pro is 3.6kWh that can have an additional 3.6kWh battery added; thus linking two of them together, can yield close to 11kWh of usable power generation; overkill for most situations unless also taking into account emergencies). The pricing has dropped dramatically in the past year to the point where I may pull the trigger for one unit as a starter (since the cost of one unit with additional battery plus say 1.2kW of PV), could pay for itself in 2 years if running a bunch of wall AC's or split AC units for most of the day/humid evenings as well as two refrigerator/freezers). And while I don't own an EV (the pricing and lack of infrastructure never made sense), the fact that I can use this as a charger, would make moving to EV finally attractive as more auto options are now becoming available. HECO should be making it far easier for residents to get onboard (rooftop PV) before the company starts finding itself losing to actual feasible turnkey (mostly plug-and-play) off-grid solutions that don't require a technical background to setup.
It's not reasonable! Please use common sense! We are already having issues switching from 3 different power sources. It's not a seamless transition, I do appliance repair and have never replaced so many computer boards as I have in the last few years. Thanks Dave
All new C&C construction and public projects should be required to use solar energy. The new Civic center will lay down lots of new concrete and asphalt. The roofs could be for solar and green space.
Looks like good location however, please make it un-viewable from the driving road unlike the Palm Springs California Area that has wind farms that absolutely destroy the natural scenery as well as highway to Las Vegas from Los Angeles - gigantic solar farm that is viewable from the freeway.
I own 19 Solar panels and have a back up battery. I have been told that HECO takes a percentage of my stored battery power and sells it. Is this true? I hope this is just bad information. Please clarify.
James

REZ Comments Collected
Wind is not a sensible energy solution, especially compared to solar. The turbines are extremely large and costly to produce and maintain, especially near Big Island the water is deep to install, and they are an awful eyesore to coastal residents and ocean users.
Great open lava lands for a solar farm!
I think a small nuclear reactor located on Schofield could provide clean power to the entire island.
When is this so called green energy going to lower our rates? Go back to coal and lower our rates. What good is renewable energy if our rates keep going up?
Electric prices are way too high
Electric prices are way too high
Get the Home Owners Associations under control. They are denying homeowners' requests to install new solar panels for arbitrary reasons. These requests were developed by professional companies and were approved in the past.
At this point, "affordability" is the most common concern. Maybe 100% renewable energy is not the future your customers are looking for, unless you can show that it will not negatively impact affordability.
Please have a counter that shows how much more Hawaiians are paying now that the coal plant was shut down. This should be a running total.
In Orkney, they generate power using tidal energy. The tide is rising or falling 24 hours a day, spinning the turbine. They generate 104% of what they need! Have we looked into these turbines to see how to apply this technology in our island state? Orbital Marine Power in Orkney
I think it's a big mistake to go green without having a backup. Solar is a joke and only works during the day with clean panels. Look at how much dirt are on the panels just installed in Kapolei, they are covered in red dirt, last time I checked the panels don't work very well when covered in red dirt. The windmills are a whole other story, built close to residential areas, killing wildlife, environmental unfriendly. Don't get me started with the closing of our only coal powered, what was the problem with clean coal? China is building a new coal plant every week, and they aren't even near as clean as ours was. Hawaii's whole energy direction is political driven by the tree huggers and are forcing the rest of us to pay for their political agenda.
Would like to have a commitment to have the electric vehicle charging stations a high priority to have them working. The one next to Tommy Bahamas in Mauna Lani has not been operational for some time. I drive a Tesla but my next car will be a gas car due to frustrations in charging. This is especially true on Hawaii where distances are great and may need a charge before driving home.
Placing charging stations in park areas would help to serve the local communities and keep traffic away from commercial stores
Placing charging stations in park areas would help to serve the local communities and keep traffic away from commercial stores
I don't see any comments or considerations regarding the best energy source— nuclear power.
Bring back the NEM program, and create more free EV charging stations. There are not enough on this island!
I concur with so many other commenters that there is great opportunity to increase solar use and to add battery power, but that there needs to be additional incentives to install new solar plants or improve existing ones. This would have the added impact of preparing the neighborhood for the days when electric cars are the norm and not an expensive novelty.
Pacific Paradise Mountain View Manor off of Oshiro road is a fast growing community. There are more sunny days than before and the potential for solar seems to be increasing.
Forget green. Rely on nat gas
Affordability should be a top priority for HECO as the Islands people are already suffering financially. Too many other economic issues making it hard for residents to afford to stay here and live. Everyday basic needs should not be hard for everyone to afford.
Place solar panels on the RAIL guide way. That will use available space, it will be non-obtrusive, it will be near the primary user, the maintenance will be easier and excess power can be stored under the rail where space is available. Alternate wind (small scale) and (vibration) power generators could provide power at night. As it become successful, freeways and viaducts will also become an options.
We'd love the opportunity to install roof top solar panels to help with home electrical cost and to help save our planet. What are the Hawaii county incentives to help us achieve this with our home and electric vehicles?
Co-locating solar and/or storage with the new water well infrastructure that is going in would make sense. The pumps are high-demand loads that could be mitigated by having generating capacity close by. The large electrical feeders also make for a good conduit to feed power back into the grid. The area is largely out of view from other areas, which helps to minimize visual disturbance.
Ideal location for offshore wind power farm
Ideal location for offshore wind farm. Offshore wind installations have an added benefit as a fish aggregator. Offshore wind power is good for energy and food sovereignty.
Good location for deep geothermal power plant.
How about you quit the bulls bit and recognize you have geothermal like Iceland quit trashing the islands with solar and wind turbines and support nuclear/fossil fuels while getting the real research done. This is crap buying into "climate change" the height or arrogance and at worst the decimation of our freedoms and our islands.
Please stop forcing this on everyone! Your rates are already insane and without the coal plant, doubt they will ever go down. This will do nothing except raise rates more, our grid cant handle it and will make any power outage increase. This isnt a way to reduce costs to residents, thats a lie. If people want to be more green, let them but stop forcing this until you can make it cost effective for all and the grid can manage.
Ag Zoning not specifically approved for BESS battery storage. Could be legal challenges. Naalehu Solar Project not in line with Kau CDP. Site infrastructure (connection to roadway, paving, left turn lane off highway, could cause significant cost to project. Panels will reflect a significant amount of light towards residences in Waiohinu and Kiolaka'a. Surrounding property owners do not support this project.
I want you to provide the least expensive energy you can, regardless of the source. Don't push what you call "clean" energy before it's time. When "clean" energy sources become less expensive (without subsidies) than conventional sources, they will automatically become the norm. Your job should be to provide the best service possible at the best price.
So many people can only afford the cost of townhomes. We aren't able to get fiber and obviously cannot get solar with shared roofs because of HOA rules. Let's get the HOA on board and it's unfair that people in townhomes have to pay higher costs for electricity and internet because of something they cannot control
We need Hydrogen as a power source and part of our infrastructure

REZ Comments Collected
To encourage more roof top solar, Helco needs to allow the solar credits generated to be applied to the entire electric bill, specifically the minimum charge. If I generate more KWH than I use in a year, I should not have to pay a minimum charge every month. Hello is getting the benefit of free KWHs, they should not be greedy and still bill a minimum charge on top of receiving free electricity from the consumer.
have studies been done for hydro pumped storage to better store excess wind and solar energy?
Big hurricane, solar panel wiped out, wind turbines destroyed. Where does power come from?
Big hurricane, solar panel wiped out, wind turbines destroyed. Where does power come from?
Seems like a few SMRs (Small Modular Reactors) could take care of Oahu's energy needs with minimal footprint and almost zero cost for fuel transportation and no carbon footprint. Is this possibility being examined?
Lots of vacant or little used land here for a solar farm. It would be hidden from the road by trees. Those who want to go back to coal are fooling themselves about what coal does to our island. We need to get off of coal completely. Also there are quite a few opportunities for geothermal production that should be explored.
Please continue to do all that you are doing, setting and reaching goals within as reasonable time of as possible. Battery storage is good, but can the average household afford it and, if not, what then is the answer.
Include geothermal in the forefront of discussion.
Partner with DOE to install solar canopies over existing parking lot which is located near the street for easy connection to HECO grid.
I recently got an email about a new meter, which I greatly appreciate this advancement I wonder if there has been a discussion of installing "smart meters." This would greatly aid power management, a key component of a grid based on renewable sources.
Kaiser High School has a huge parking lot and adjacent field which could be used for solar canopies or a small-scale solar farm. Close proximity to the street for HECO grid connection and nearby fire station for added security and safety.
Parking lot solar canopy which has been done at other DOE campuses. Win-win! Provides shade for vehicles and generates solar power to help lower rates for the community. Close proximity to street provides convenient and unimpeded connection to HECO grid.
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Install more EV chargers! There are NO public chargers from temple valley all the way to turtle bay. Yet, there are plenty of people that commit along this route and more and more are switching to electric vehicles. Incentivize at home charging with better rates for EV owners to charge during off peak hours!
Install more wind turbines in highly productive areas.
Install a traffic circle right here for all the people that like to turn left in the evenings. ☹️
Do many of the warehouses/businesses have solar panels on the roof?
I know there are going to be electric vehicle charging stations in the new parking garage. Is there a plan to put car port structures with solar panels on the top floor? Keeps the cars cooler, and provides electricity at the same time.
If feasible, erecting micro-grids with solar PV panels and battery storage.
I commissioned electric solar panels in October 2023. They are installed and sitting on my roof NOT connected due to lack of movement on the part of MECO and HI Electric. When will we ever get our government and utility officials to become efficient and effective in their jobs?
I have lots of room on my roof (in addition to my 28 PV panels) to make a micro grid.
I have lots of room on my roof (in addition to my 28 PV panels) to make a micro grid.
I have first hand experience in alaska with all aspects of power generation. The only good reliable power is hydro and thermo. You have a resource that could power all of hawaii with thermo from your volcano. Solar and wind have been a waste of time and money. and are very expensive to own operate and it takes 12 times the minerals that need to be mined to build. Hawaii is being lied to. Its a money makin scam. you don t build anything here you don t mine anything. so you don t see the fact that all you are doing is changing where you burn diesel. So I don t support your effort to lie about the truth.
Go back to the old power station. HECO was not ready to transition yet. You're putting the cart before the horse. Like anything else in this world you don't get rid of something until you know it is working. This is plain idiocy and childish. You're letting a bunch of people decide for you what is best to transition. Transition is slowly moving from one condition to the other not abrupt change. You didn't really transition did you? Because you don't have any full resources to back up power in the event of an island power shut down do you?
Bring back the original net metering like in the past. So many homes could feed our grid the energy needed if HECO develops storage solutions for the energy being fed back to the grid. Then during peak periods, the grid could draw from the HECO batteries.
Solar is only for the wealthy, as panels with battery are unreasonable for the poor. Tax breaks and energy savings do not payback debt, so the poor must incur greater debt, that is in addition to their mortgages and higher taxes. If the energy savings and tax breaks were SO big, then all these solar companies would NOT be sprouting out of the woodwork like mold and thriving in a million dollar median house market. Higher taxes will punish the poor, who cannot buy solar; but the rich can take advantage of the tax cuts.
Solar is only for the wealthy, as panels with battery are unreasonable for the poor. Tax breaks and energy savings do not payback debt, so the poor must incur greater debt, that is in addition to their mortgages and higher taxes. If the energy savings and tax breaks were SO big, then all these solar companies would NOT be sprouting out of the woodwork like mold and thriving in a million dollar median house market. Higher taxes will punish the poor, who cannot buy solar; but the rich can take advantage of the tax cuts.

REZ Comments Collected

I believe it is too much to ask that the island of Oahu be totally reliant on renewable energy by 2050. I think there needs to be a compromise at some point. There need to be more consideration to unintended consequences. Mark James 3025 Wailani Rd Hon HI 96813

Good place for high speed EV charger. High speed EV chargers will make EV rental fleet practical.

Good place for fast EV charging stations. A network of fast EV chargers in several popular locations on the island will make EV rental viable.

All public & private surface parking lots could be utilized for PV & energy storage. Reduce heat island effect, selective trees/green spaces. PPA or UESC etc.

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Very poor decision making from the leadership of HECO monopoly in Oahu has brought increased electricity prices to residents. The recent closure of major coal powered plant generating cheaper electricity here in Oahu, and replacing it with buying expensive oil, hence passing the increased bill to residents is not representative of a leadership that looks after their own people but instead puts political motives as priority. Change in leadership is the real opportunity.

We shut down the coal-fired plant TOO SOON!

Stop taking all my solar credits when you "reconcile" my account every July. It's bad and it's why I have a hard time really supporting anything HECO does aside from becoming a CO-OP. Your grumbles about maintaining the grid and how homeowners with P.V. don't maintain the grid.....Where does all the money go from the kW's I give you and you sell at 100% mark up but come December you have no problem when you take \$600 of wholesale electricity value from me

Stop taking all my solar credits when you "reconcile" my account every July. It's bad and it's why I have a hard time really supporting anything HECO does aside from becoming a CO-OP. Your grumbles about maintaining the grid and how homeowners with P.V. don't maintain the grid.....Where does all the money go from the kW's I give you and you sell at 100% mark up but come December you have no problem when you take \$600 of wholesale electricity value from me

I had recently contacted you about getting an energy audit. You informed me you don't do it, but I can do it myself.

Today I found out there is \$150 tax credit, rebate, for getting one. I cannot do that for myself. We are in Makaha Valley and really want to lesson our carbon foot print. Very disappointed in how you do things. I bought better surge protectors, but don't know if I am using it right. I am 65 years old and didn't grow up with technology so having new items doesn't register with my abilities. I need someone who can teach me how to use my smart plugs and new surge protectors correctly. The jealousy windows should be outlawed as so much air conditioner cooled air leaks out. People need incentives to change. We are so progressive in many ways but we are so behind in others.

I purchased my home for the calming, panoramic ocean view and beautiful, relaxing natural surroundings & have resided in it for over 35 years. I do not want the gigantic, unsightly wind turbines or large-scale mass of solar panels to negatively impact my daily life.

Put nuclear power plants on 2-3 islands and stop wasting our money on unreliable "renewables".

Provide tax credits for energy efficient windows and doors.

Windmills kill birds. Solar panels and batteries use toxic metals and enrich China.

And bring back cheap coal energy.

Wake up to real science and stop believing the climate change narrative.

Power magazine reports that fossil fuel plants like AES Kalaeloa were available 90% of the time; for wind & solar, it's 17%. So to replace Kalaeloa would require $180\text{MW} \times 90\%/17\% = 964 \text{ MW}$. When does HECO plan to have that much? Also how long can all plants run 24/7 without overhaul ?

REZ Comments Collected
Once every 20 years, we should reenact the battle of Nu'uauu. This would pay tribute to the cultural heritage and history of our aina and reduce carbon emissions by 50% every generation.
Tidal energy, please
Renewable energy must not come at the expense of native habitat and species. Use previously developed land and areas that are already covered with non-permeable surfaces.
older apt building has roof-top solar but benefits only the owner of the solar panels not the apt owners. Would like to see a direct benefit to the apt owners by a discounted diverter installation device.
older apt building has roof-top solar; solar panels' credit belongs to/benefits roof-top solar panel owner; unable to divert credit to apt owners who really need the break to high electricity bills. Building already installed LED lighting on premise, and not much savings to the apt owners. Would like to see some type of relief to the apt owners.
I like the idea of owning an EV, however living in a condo, at home charging is not an option. It would be nice to see more super charger availability, powered by renewable sources.
Make PV panels available for homes. Rotating panels in open pasture.
All new housing to include townhouses, not just in Ocean Point but all of Oahu, should have mandatory minimum solar installation. If the purchaser wants more solar, the developer can add it to the price of the home but at a minimum the home will have solar. For example, a 1700sq ft home should have a minimum of 7KwH system.
I concur with having a Nuclear Power Plant. For all that say it is too dangerous, we have floating Nuclear Power Plant (aka Navy Ships and submarines) docked in Pearl Harbor all the time. Oahu emergency power plan is based on connecting those nuclear ship or submarine to the power grid.
A lot of these comments, the way they are written and the context used, are not from local people, get real. All those charges on our bill is the problem. The only thing that change is the rate, and do cable companies pay the electric co to use their poles etc... if so why can't we the customer of electric get a discount since we are the ones who paid for the poles etc.. in our bill
Every home could be nearly 100% self sufficient with subsidized solar systems. Currently, an on-grid solar system is quite expensive and people cannot afford this among other bills.
Not sure why the dot on the map is out where there is currently no infrastructure.
Resilience would be my best choice because the project will need that to meet and address all of the projects planned in a way to meet everyone's needs which I feel will need lot of give and take.
It's good that you are pursuing purchasing power from homes with battery back up to cover peak power surges, but if you really want to save life on Earth, bring back net metering. Incentivising the purchase of solar panels/battery packs by buying electricity from individuals and businesses is the fastest way to get to net zero. Many states do it successfully and we have optimal conditions. Don't develop land, disperse not centralize.
It should be embarrassing that HELCO cannot keep a Level 3 charger working ON ITS OWN SITE! This charger is frequently (as in every time I've ever been there) not working. If we want to encourage EV use then adequate charging needs to be available. Keeping this charger up and working should be a project given to a team of people who check on it daily.
I do not subscribe to the eminent disaster rhetoric of "climate change", nor is there any data to suggest that humans contribute to or can change climate. If people want to generate their own power to get off the grid, I would encourage them to do so; however forcing everyone to do so is costly, unnecessary and just another tool to control people who are not harming anyone. The components of batteries that are needed to store the various alternatives create toxic waste and contribute to the enslavement of the poor in the countries where they are mined.
I do not want to live with chainsaws, logging trucks, increased degradation of our neighborhoods, towns, and highways, clearcuts, polluted air and water, higher electric bills, and corrupt political back-room deals, and entitled - arrogant billionaire investors. I want Hawli Electric to wake up to reality and tell Hu Honua to bugger-off.
There is space to plant trees for shade and reduce the heat from the road.
Solar is currently supplying full house power and do not need to connect to the grid, however the incentive to give solar back to the grid is small. Getting a 4 to 1 ratio of solar kWh in credit seems to be inadequate to incentivize trying to help us. I am pretty sure the electric company would prefer no solar as they are losing money with every house becoming self-sustaining. I agree that you do need to be able to initially come up with a good sum of money to pay for the solar installation and the interest rates are ridiculous for solar loans. The tax breaks are pretty good though. For a 10 kWh system you can claim \$10,000.00 in tax credits for state and depending on the cost of the complete system, 30% of that can be claimed in tax credits for federal. Lets get together on this solar plan and make sure the customers are #1 if they choose to go with solar and really make it worth while. Otherwise we are talking out of both sides of our mouth.
We are long overdue to start thinking long-term and begin development of generation 3 nuclear power. We are not going to meet our needs with windmills and solar panels. The future is nuclear and we must begin making up for lost time. An energy poor island is simply poor. The situation on Oahu is already untenable. Add to that premature decommissioning of power plants without replacement energy is foolish. Bad decisions all around!
I like the community solar farm concept like the one being built in Makakilo. These need to be done with adequate battery backup. I would like to hear about plans to recycle old solar panels and storage batteries too as this is important to truly consider these systems green. I would also like to see more hydrogen infrastructure. Hydrogen should be used initially to power commercial and municipal vehicles that return to a central facility.
solar and pumped hydro storage on koko headlands
Look into retrofitting old fossil fuel facilities for long duration energy storage. Can do either retrofit or build new. Look at "cryostorage" or "compressed air storage" as that technology looks very useful and easily implemented for long duration energy storage!
At a minimum solar canopies over the parking lot of the planned stadium. The maximum is build a mini SoFi stadium and install solar panels and batteries. Contract full retail net metering for 25 years as a incentive.
Install solar canopy over whole Hikimoe Street making it the first solar street. Being a bus hub connecting to the rail station makes perfect sense to provide cover for commuters. It also perfect for charging stations for electric buses.
This part of Waikele Center parking lot has become a food truck hub and has a blood donation truck. Put a solar canopy here to soak up the sun instead of the asphalt. Bring out nearby charging station from hiding by the trash area and install several charging stations here.

REZ Comments Collected

All new build construction, (commercial or residential) should be required to install solar panels to help mitigate general fuel usage. All residential areas should also be encouraged to plant a tree or two within the property to keep the environment clean and green, a very small way but attainable.

Government policy inquiry/commentary. Please consider the future of energy production in Hawaii. A diversity of power generation resources is critical. Committing to a "renewable-only" strategy could leave us vulnerable when weather isn't optimal, eg, storm conditions and storm related damage to panels, prolonged cloudy conditions (has happened a few times over the years), etc. Can a non-fossil fuel grid handle the load when every vehicle is required to charge? If every electrical demand is reliant on solar panels and wind turbines, what is the current capacity of those renewables and what is the current demand including vehicles that currently don't rely on electric charging? It's understandable that HECO is subject to government policy and regulation. The PR of converting to renewables is a good strategy given the one-sided conversation of energy future. Is the discussion about fuel elimination, or emission reduction, or developing an solar/wind industry over fossil fuel? Cost benefit analysis has to be more transparent beyond "we should do this because we're saving the planet". It's understandable for HECO's business future to relent to government dictate, but is that the best future not just for perceived world saving, but for cost saving? Hawaii's COL is the highest in the US. A single option solution is never good for preparation or for efficiency. Plus most people can't afford extra energy cost when everything else is already costly. If the goal is to weed out those who can't afford to live here, that goal is well underway. And it's understandable how HECO and Hawaii's government would think that less people here is the goal. That is not sustainable.

I'm a retired oil company engineer and my stake in Oahu's energy future is much the same as yours - seeking practical, non-polluting, long-term energy solutions.

That said, it is a very good bet that HECO will NEED spinning turbine-power to provide a reliable 24/7 power grid well past 2045 (in other words, HCEI's "bold goal" of 100% renewables by '45 will NOT be met). If we (You) don't plan for that eventuality, the good people of Hawaii will continue to burn expensive / polluting liquid hydrocarbons while much of the world flares (see link below) unwanted natural gas (methane) because they do not have a "local" market. Liquefied Natural Gas (LNG) regassification on Oahu is already done on a tiny scale. "Regas" is the easy part, making the Oahu-based infrastructure small in comparison to the LNG cryo facilities that put LNG into special LNG tankers & ship it to us. This is a very-well understood technology and HECO is well-positioned to be the champion of large-scale LNG. IMHO HECO was foolish not to continue its 2016 LNG project with Hawaii Gas.

Every day not spent developing large-scale LNG for Oahu is a day that we burn dirty oil instead of much-cleaner natural gas. Be the leader.

<https://thedocs.worldbank.org/en/doc/1692f2ba2bd6408db82db9eb3894a789-0400072022/original/2022-Global-Gas-Flaring-Tracker-Report.pdf>

1. Use former fuel tanks at Red Hill for pumped hydro storage.

2. Lease roof space on warehouses, state and county buildings, for HECO solar panels.

3. When building solar panels on ag land, make them high enough for shade-tolerant crops to be grown underneath, and for animals to graze to keep the foliage down.

Aloha Hawaiian Electric,

Thank you for asking for our input. When I was younger I watched computing transition from "really big machines" (mainframes) to "Massively Distributed Processing" (servers). I believe the future of Renewable Energy will follow a similar path, and we will soon see the birth of Massively Distributed Energy Farms. These farms will be owned, operated and managed by local public utility companies, but the collection of energy will take place throughout the community. Below are a couple of ideas I've been thinking about.

1) Work with the County to modify the existing, or create new, public utility easements to allow Hawaiian Electric to install Energy Collection Devices (i.e. solar, wind, rain) as well as Storage Capacity (batteries) and Energy Distribution Devices (EV and/or other battery charging mechanisms.) Collection devices and charging stations could be placed

a) along certain County roadways

b) County recreation facilities

c) County, State and Federal public parking areas

d) Privately owned parking lots over a certain size (Residential, retail, hospitality)

2) Reach out and work with landlords/owners of Large Paved Parking lots.

a) Most landlords/property owners don't want to become "Solar Experts"

b) Storage capacity and distribution capacity could also be included

c) How many landlords, owners, tenants and customers would love:

i) high-shade over their parking lot

ii) EV (and other) charging capacity in their parking lot

iii) Reliable, safe, worry-free Renewable energy

3) For the Off Grid community: Replace propane canisters with battery capacity

a) Build out community charging stations, similar to transfer stations and water stations.

b) Customer can plug-in their battery and wait for it to charge; or

c) Customer can "swap" drained battery for fully charged battery

i) HECO could charge batteries off-site and transport

4) Residential Off grid or On: Offer a "carport" configured as a Renewable Energy Collection System

a) Homeowners want solar;

b) Homeowners don't want to become solar experts; or get stuck with a product that might not be supported in the future.

c) Homeowners want to TRUST their energy supply!

d) Charge a flat monthly rate (off grid) and/or standard electric rate (on grid)

e) HECO would Own, Manage and Maintain all of the equipment

f) Customer gets a carport : HECO grows it's Massively Distributed Energy Farm

REZ Comments Collected

Multifamily charging and offsite energy. Micro turbine CCHP incentives. Delivery vehicle electrification. Highest efficiency solar. Merge or partner with experienced company like Engie for rapid evolution of Electric company into clean generation, fuels, and waste conversion, high efficiency clean power generation, and export potential of energy and byproducts of processes.

Invest a community solar in this long undeveloped land that has no claimed ownership. The lure of cheap electric will hopefully give landowners around this land incentive to give up their potential stake in the land. Installing a large solar canopy over this land and batteries for each landowner and offering the community an opportunity to invest and benefit from lower electric bills will give this barren land a purpose. It is my hope these landowners follow their neighbor across the street, Highway Inn in their investment of solar and batteries on their business.

Put large solar canopies, batteries and EV charging stations in this large parking lot.

Want to vote for the fast EV charging stations, especially at locations that are centrally walkable to destination attractions (like the Azeka marketplaces, and the major beach parks in this area, and grocery stores). Incentivize large businesses to host charging stations /more charging stations and keep them running. (Maui Brewing is a good example of a success story there.) There are some charging stations that are not operable and haven't been for months - how to ensure that they stay running?

Consider viability of ocean-based renewable energy. This bay specifically gets very high wind and wind-wave action because of the funneling effect between the west maui mountains and Haleakala - can we harness some of that energy via wind mills (like in the northern seas around the UK and scandinavia?) or via wave power bouys? Understand that these options might not be worth the additional environmental effects on the ocean... but not sure?

Put windmills on Mauna Loa and/or Pala'au plains. Previous efforts to this effect were very badly planned and communicated because all the power was going to get shipped off-island with no benefit for Molokai residents. Ensure all Molokai residents get this power FIRST and pitch the idea of selling power to the neighboring islands for the benefit of Molokai residents (i.e. residents get free power paid for by the sale of power to neighboring island grids, which are more power-hungry/consume more power. Neighboring islands get more sustainable power to help bring their costs down, and the Molokai community will be incentivized to support the plan for their own benefit.)

Consider incentive programs for homeowner/homestead sized windmills. Like this: <https://www.energy.gov/energysaver/small-wind-electric-systems>
Need the county/state planning departments to make permitting for installing these windmills simpler and easier, or make blanket exceptions or something. Is it possible to have these in dense neighborhoods like Kahului/Wailuku/Kihei, or do you need bigger homesteads like < 1 acre, or what? There are very small ones that are designed for home use applications, and larger horizontal access ones that might be good for farms/ranches that have more space. Even the small ones can generate a significant amount of power for the average home consumer, and just add reliability/redundancy to the grid.