

Distribution Planning Working Group Meeting #2
Thursday, August 8, 2019
10:00am – 2:00pm
American Savings Bank Tower, Training Room 1

Attendees

In-Person

Marc Asano, HE
Paul De Martini, Newport
Consulting
Colton Ching, HE
Ken Aramaki, HE
Alan Hirayama, HE
Meredith Chee, HE
Kayla Kawamata, HE
Marie Olt, HE
Nohea Hirahara, HE
Corinne Chang, HE
Amanda-Joy Viramontes,
HE

Randall Lui Kwan, HE
Rebecca Dayhuff-
Matsushima, HE
Greg Shimokawa, HE
Isaac Kawahara, HE
Marisa Chun, HE
Christopher Lau, HE
Vladimir Shvets, HE
Jon Shindo, HE
Amanda Yano, HE
Jay Griffin, PUC
Dave Parsons, PUC
Jay-Paul Lenker, PUC

Jennifer Potter, PUC
Gina Yi, PUC
Gerald Sumida, IPP
Developer Representative
Henry Curtis, LOL
Wren Wescoatt,
Progression Energy
Marcey Chang, DCA
Robert Harris, Sunrun
Kylie Cruz, Earthjustice/
Blue Planet Foundation

WebEx

Caroline Carl, Hawaii
Energy
Clarice Schafer, PUC
Damon Schmidt, HE
Dana Cabbell, Southern
California Edison
Dave Okamura, DCA
Dean Nishina, DCA
Dennis Lee, HE
Doug Staker, Enel
Eric Kunisaki, HE
Forest Frizzell, Shifted
Energy
Gene Lee, Southern
California Edison
Jessie Ciulla, Rocky
Mountain Institute
Jonathan Wuo, Southern
California Edison
Kandice Kubojiri, HELCO
Karen Pavletich, Puget
Sound Energy

Kathy Yonamine, HE
Kylie Swider, HE
Li Yu, Quanta Technology
Liza Jang-Che, HE
Melanie Higa, HELCO
Mike Lum, HE
Reid Shibata, Puget Sound
Energy
Richard VanDrunen, HE
Riley Ceria, HELCO
Steven Rymsha, Sunrun
Susan Char, HE
Susan Chow, HE
Tracie Black, HE
Tricia Rohlfing, Hawaii
Pacific Solar
Will Giese, Hawaii Solar
Energy Association
Will Rolston Energy Island
Zhuoning Liu, Quanta
Technology

Objective

- Provide overview of DPWG's activity to-date
- Discuss soft launch opportunities and associated engineering analysis and needs identification

Agenda

- Introductions and Overview
- Soft Launch Purpose and Objectives
- Distribution Needs Assessment Process
- Soft Launch NWA Opportunity Identification
 - Ho'opili Analysis and Opportunity
 - East Kapolei Analysis and Opportunity
- Soft Launch RFP Schedule
- Next Steps

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Key Takeaways:

- Expand IGP Soft Launch to include:
 - NWA RFP for East Kapolei, including Ho'opili Reliability Service slated for draft release Sept. 3.
 - Consider NWA Programmatic Pilot for Ho'opili working with DR Horton (scope & plan tbd).
 - Stakeholders noted that it is necessary to engage the developer for NWA for new home developments so that solutions can be designed in and packaged for the initial home sale.
- Comments on RFP Requirements:
 - Quantity, suggestion to simplify proposed amount requested to:
 - 3 MWs for up to full duration needed (do not break into blocks)
 - Allow uniform minimum increments of less than 1MW
 - Frequency, need to resolve whether dispatched every day pre-emptively or in response to event (response time of less than 12 seconds)
- Information Requested:
 - Provide MWs per hour associated with overload curve (i.e., area under curve)
 - Full schedule through NWA operational date, particularly the regulatory approval schedule
 - Will CSS solutions resolve the technical needs alone? (example would be helpful)
- Open Questions:
 - Will contracted NWAs be allowed to participate in other grid services, now and/or in future?

- If now, so will bidders be allowed to submit common proposals in both the SL RFP and Stage 2 grid services RFP?

Discussion

- I. Soft Launch NWA Solution Considerations
 - a. Existing solutions are in the planning assumptions already, so HECO is looking to add on new or supplement to existing programs, tariffs, or PPAs.
 - b. HECO is looking for diverse solutions rather than a singular type.
 - c. Stakeholder – Procurements are one type of mechanism, there should be considerations for programs and pricing options as well. May be easier for customers to understand what we are sourcing from the market.
- II. Anticipated Soft Launch Learnings
 - a. Other states looked at higher dollar value investments
 - b. Partly it depends on how much it costs to build the NWA.
 - c. Stakeholder - Simpler systems should have less stringent requirements.
- III. Grid Needs Assessment
 - a. HECO- DR Horton is sensitive to holding the price point on ensuring the homes remain affordable. No plans to pre-build homes with PV or batteries; customers need to have a choice.
- IV. Distribution Planning Process
 - a. HECO - N-1 planning criteria used for distribution system, which means if a piece of equipment fails on the distribution system how do we solve for that?
 - b. Stakeholder - If the NWA is specific to location, how do you address the reliability and resiliency issue such as sea level rise, how do you consider that?
 - i. HECO - We do consider that as a factor in evaluating two or more options and we select a solution that accounts for that. We are looking at sea level rise maps for our distribution planning.
 - c. Stakeholder - On an earlier slide, you said NWAs need an interconnection agreement. Do you include DR, energy efficiency, and other BTM solutions?
 - i. HECO: Any generation interconnected to our distribution circuit must follow Rule 14H requirements. However, At the time of the bid submittal, the interconnection agreement doesn't have to be submitted with it. We are technology agnostic at to the type and/or combinations of DER that may provide the NWA.
 - d. Stakeholder - Where do you find/develop solutions? Is it in-house or from market?
 - i. HECO – Both internal and external solutions. Internally, we identify more conventional solution options include, rearranging distribution equipment or adjusting equipment settings as well as infrastructure upgrades. Externally, we consider DER solutions that customers may and/or have already adopted as well as soliciting market based solutions.

- ii. Stakeholder - You could put in the RFP, “here is the need and here are 5 ways to do it”. Another approach is, “this is what we need – you tell us how to get there”.
 - iii. HECO – agree, our approach is to identify the grid need and anticipate the market to make proposals – we don’t presuppose what the market can provide.
- V. Methodology of Analysis
 - i. Stakeholder - How far back do you look for that calculation?
 - 1. HECO - We look back at up to ten years of historical load data is used in the regression calculation of the forecast. 1 day in 10 years is the industry standard for forecasting (more conservative). For the East Kapolei/Ho’opili analysis 1 day in 2 years was used, which is less conservative.
 - 2. HECO - We make distribution investments on a quicker timeframe as the system is very dynamic. About a 3- to 5-year planning horizon.
- VI. T&D Non-Wires Alternative Definition
 - a. Stakeholder - Is hosting capacity included in the definition [in reference to the term “loading”]?
 - i. HECO - Yes. The term “loading” in the definition refers to the capability of a circuit or capability of a piece of equipment to safely flow power in either direction. It does not refer to a customer’s load.
- VII. Distribution Service Definitions
 - a. HECO - Industry has been focused on NWAs more for distribution capacity service. California is starting to evaluate reliability back-tie services
 - b. Stakeholder - NWAs used in California at the 66 kV transmission levels, in emergency/ contingency situations and are exploring that now.
 - c. Stakeholder - Is the capacity modeled matching the device ratings and capabilities in the evaluation?
 - i. HECO - Yes, we look at the needs and modifications of existing equipment.
 - d. HECO - We do forecasts on an unbundled approach. Forecasts will be done with layers of various types of DER. NWA Performance Parameters
 - e. Stakeholder - Are you assuming on day one that PV would be there?
 - i. HECO - No, we did not assume that in evaluating the need because the developer said they don’t intend to sell the homes with PV already installed.
 - f. Stakeholder - Is there an opportunity for the utility and developer to have a shared interest in building PV on the homes?
 - i. HECO – Yes, we are interested to to explore as part of a new homes program to address for new developments
 - ii. HECO – If PV is not built into new home, there will be some delay between when a customer buys the house and later installs a PV system

- to reduce their home's load. To date, of the existing customers that have purchased homes in Ho'opili, only 10% of customers have adopted PV.
 - iii. Stakeholder – there is also a potential issue for a new home with PV that has yet been sold – who gets the tax credits, what rate applies, what is the role/obligation of the home developer? Suggestion to have the PV developer pass on the tax credits earned for building the PV on unoccupied homes to the homebuyer.
 - g. Stakeholder - Do you have end-use saturation data by circuit?
 - i. We have a potential study that NREL did in 2015.
 - ii. RASS – residential appliance survey
 - 1. Done in 2015 or earlier, by our Customer Load Research group.
 - h. Stakeholder – If anyone has gone past the Ho'opili development, the air conditioning units are quite large, and present a substantial load potential.
- VIII. Load Shapes Used to Develop Load Forecast
 - a. Stakeholder - What does the forecasted load shape look like for a typical household?
 - b. Stakeholder - Regarding the figures, the Commercial Load Shape (right)
 - i. Where does the shape come from?
 - 1. HECO - It comes from our historical load data
 - ii. Are you factoring in the DER or energy efficiency programs?
 - 1. HECO - Yes, the developer provides load projections based on the construction of the types of homes and loads.
- IX. 2022 Ho'opili Contingency Overload
 - a. Stakeholder - Regarding the figure, what is the possibility of this event happening? How often, and when?
 - b. Stakeholder - Is this a contingency case? Why are you showing a 24-hour load curve?
 - i. HECO - LoadSEER model inputs 576 profiles, which are composed of the average 24 hour profiles for a weekday and weekend day for each month of the year.
- X. 2023 Ho'opili Contingency Overloads
 - a. Stakeholder - Is the figure showing just the highest overload of the year?
 - 1. HECO - Yes
- XI. 2023 Ho'opili Needs
 - a. Stakeholder - Regarding the figures, is there EV charging?
 - i. HECO - No, EV charging is not assumed in the projection at this time.
 - b. Stakeholder – it could make the overloading worse if the customer is charging coincident with the load.
 - c. Stakeholder – suggestion that solutions need to be sited and ready to go at the same time as the house is built.
 - d. Stakeholder – suggestion to consider with the Soft Launch is to work closely with the developer and Electrification of Transportation department to create a master plan for the subsequent phases over the next 15 years. Alternatively, its just a one-time discrete need that can be solved by an NWA procurement.

- XII. Ho‘opili Phase 1 Avoided Cost
 - a. Stakeholder Questions about the Table:
 - i. Is the \$1 million a general rule of thumb for 1 MVA transformer?
 - 1. HECO - Distribution transformer standard is 10 MVA, this is the total project cost.
 - ii. Are the costs an NPV of the deferral or something else?
 - 1. HECO - NPV, Levelized over the life of the traditional solution.
 - b. Stakeholder – what is the timing of the need?
 - i. HECO - In general, it takes about 2 years to perform the engineering, design, and construction plus 1 year for PUC application (GO7) approval.
- XIII. East Kapolei Need
 - a. Stakeholder Questions/ Comments about the Figure:
 - i. Facilitator - How do other utilities break up and define the need blocks?
 - 1. Stakeholder - At one utility, the need is similarly separated into a block of 3 MW for 6 hours, and one shoulder block.
 - 2. Stakeholder - At another utility, the minimum duration is 6 hours or more. It is difficult to make the BCA analysis work for batteries. BTM program may have overlapping batteries in 4-hour increments, to cover a longer duration need, say 8 hours.
 - ii. Stakeholder - Is there a baseline for pre- or post- NWA?
 - 1. HECO - For the NWA evaluation, we would create a portfolio of solutions to meet the need.
 - iii. Stakeholder - What about this example – A CSS solution that eliminates its own load doesn’t get compensated anything, so what incentive is there for them?
 - iv. Stakeholder - What would determine a call or trigger the NWA provider?
 - 1. HECO - Two ways:
 - a. Pre-scheduled dispatch/ call on service
 - b. Increased communication so that you can dispatch on-demand whenever the overload occurs. Response is within 12-seconds.
 - v. Stakeholder - Do you have a minimum number of calls per year?
 - 1. HECO - Due to the need, the resource would be scheduled daily at a set time. The anticipated number of calls is 365 because the projected overload is daily.
 - vi. Stakeholder – Day-ahead notification seems to work well in New York for distribution capacity deferral service.
 - vii. Facilitator - Any comments on the minimum proposal size the utility is willing to accept?
 - 1. Stakeholder - Suggestion to require the whole 3 MW block. The days when the NWA cannot provide services, the NWA needs to account for that into their proposed costs. Specify a minimum number of days to provide services.
- XIV. Soft Launch RFP Tentative Timeline

- a. Stakeholder:
 - i. Is it possible to look at the surrounding areas and see if the NWA can have additional benefits?
 - 1. HECO - The difference with Ho'opili is that the circuits feeding into Ho'opili development have lesser loads already. Existing loads/customers are being moved to other circuits to make room for the Ho'opili load growth
- XV. Next Steps
- a. Stakeholder – What does the cost/kWh look like for energy efficiency programs? How do we track this?
 - i. Stakeholder - There are customer energy efficiency incentive programs for things like LED lighting, Energy Star appliances, etc.
 - b. Stakeholder - Suggestion to release the draft RFP out sooner [by a couple of weeks] and use it as a driver to flesh out the details in the working group. If it doesn't work, then explain to the Commission why it needs to be pushed out.
- XVI. Open Discussion
- a. Stakeholders want to see the forecasted loading scenarios with current non-export and export programs
 - b. Discussion on Customer Self-Supply (CSS)
 - i. If a customer purchases a PV system under CSS to reduce their own load, can this help to prevent the overloading issue?
 - ii. Can the PV system be managed to remedy the issue of overloading?
 - iii. If the PV system is managed on a day-ahead schedule, is there a party to manage it?
 - 1. It could be an aggregator
 - iv. In a contingency event,
 - 1. The CSS has no obligation to be dispatched (non-export system)
 - 2. Whereas the NWA is required to be there when it's called upon
 - c. Multiple Value Opportunities
 - i. Stakeholder - Would you consider allowing customers to participate in both programs and be dispatched as part of an NWA? Companies to consider this.
 - ii. Stakeholder – Several options are available in New York, where there are programs to promote value stacking. Lower hurdle rates under programs and higher hurdle rates for market sourcing.
 - iii. Stakeholder – You don't want a contractor to bow out of the RFP if there are more lucrative opportunities that are not so exclusive.
 - d. HECO - The proposed timeline may be compressed to accomplish the NWA procurement.
 - e. If this is a learning opportunity, then the utility should allow the market to show what it can do. HECO – agree, this is the intent of the soft launch
 - f. Stakeholder suggestions for Soft Launch RFP:
 - i. Add location and technical details to an appendix instead of within the RFP;

- ii. Request a minimum of 50 kW per proposal;
- iii. As for pricing, request a min and max \$/kW with associated min and max kW bids;
- iv. Request kWh and kW, or kW and hours per day available;
- v. Set a max and min number of hours needed per year;
- vi. Verify if we prefer a day-ahead or daily dispatch (or other approach since a contingency based service) schedule for the NWA;
- vii. Procure for the MW peaks each year, not the entire thing projected 3 years in the future.

Soft Launch RFP Tentative Schedule

| 2019 Milestones | Proposed Date |
|---------------------|----------------------------|
| Draft RFP Release | Tuesday, September 3, 2019 |
| Stakeholder Meeting | Week of September 9, 2019 |
| Comment Period | Week of September 23, 2019 |
| Final RFP issue | October 15, 2019 |
| Proposal Due Date | December 17, 2019 |

*Schedule will be updated when the RFP is released.

Action Items

1. Issue the draft RFP as a focusing point for further discussions
2. Provide prior forecasts that supported the existing grid build out to support Ho’opili, actual load growth to-date and project growth in 2020 and 2021.
3. Provide percent loading on circuits, customer counts and customer types for circuits related to the NWA need

Follow-Up

2. Provide prior forecasts that supported the existing grid build out to support Ho’opili, actual load growth to-date and project growth in 2020 and 2021.

The Ho’opili Development broke ground in September 2016. Since then, the peak loads on the two circuits serving the development has increased year to year. Below is a table of the actual peak loads on Kamokila 4 and Kapolei 4 from 2016 to 2018.

| Actual Peak Load (KVA) | | | |
|------------------------|-------|-------|-------|
| Circuit | 2016 | 2017 | 2018 |
| Kamokila 4 | 2,552 | 2,504 | 3,298 |
| Kapolei 4 | 1,447 | 1,545 | 1,651 |

The table below shows the projected loads in the Ho’opili study area in 2020 and 2021. Data is based on the load schedule provided by Ho’opili Development, dated 02/26/2018.

Projected Annual Incremental Loads (KVA)

| Load Type | 2019 | 2020 | 2021 |
|------------------|---------------|---------------|-------------|
| Single Family | 2,372 | 3,948 | 220 |
| Multi-Family | 3,942 | 2,793 | 0 |
| Commercial | 2,175 | 757 | 0 |
| Industrial | 0 | 3,606 | 0 |
| School | 1,500 | 0 | 0 |
| Transit | 1,988 | 0 | 0 |
| Total | 11,977 | 11,104 | 220 |

A review of the distribution capacity in the area is performed to determine whether investments are needed. That review allowed the Company to utilize surrounding infrastructure to serve the initial phases on Ho’opili after exhausting all other options such as circuit re-configurations. Based on the developer’s load projections it was determined that a new substation would be needed to meet those projections in the 2022/2023 timeframe.

3. Provide percent loading on circuits, customer counts and customer types for circuits related to the NWA need

Tables below show the actual and projected percent loading on circuits and transformers in the Ho’opili study area under normal and contingency conditions.

Circuit/Transformer Loading under Normal Condition (Percent)

| Circuit / Tsf | Rating KVA | 2018 Peak | 2022 Peak | 2023 Peak | Comments |
|----------------------|-----------------------|------------------|------------------|------------------|------------------------------------------------------------|
| Ewa Nui 1 | 8,531 | 52% | 89% | 90% | Transformer served the Ewa Nui DG. DG was removed in 2010. |
| Ewa Nui 2 SB | 8,531 | 0% | 0% | 0% | |
| Ewa Nui 1 Tsf | 14,636 | 30% | 52% | 52% | |
| Ewa Nui 2 | 8,531 | 62% | 76% | 76% | Transformer served the Ewa Nui DG. DG was removed in 2010. |
| Ewa Nui 3 SB | 8,531 | 0% | 42% | 42% | |
| Ewa Nui 2 Tsf | 14,247 | 37% | 71% | 71% | |
| Kaloi 1 | 8,531 | 5% | 50% | 130% | Serving UH West Oahu |
| Kaloi 2 | 8,531 | 0% | 93% | 93% | |
| Kaloi 1 Tsf | 13,902 | 3% | 88% | 137% | |
| Kaloi 3 | 8,531 | 0% | 34% | 103% | Serving UH West Oahu |
| Kaloi 4 | 8,531 | 0% | 0% | 0% | |
| Kaloi 2 Tsf | 12,500 | 0% | 63% | 63% | |
| Kamokila 3 | 6,955 | 30% | 74% | 75% | |
| Kamokila 4 | 6,955 | 47% | 61% | 79% | |

| | | | | | |
|----------------|--------|-----|-----|-----|--------------------------------|
| Kamokila 2 Tsf | 15,147 | 35% | 62% | 71% | |
| Kapolei 3 | 8,531 | 32% | 70% | 70% | Serving East Kapolei & Transit |
| Kapolei 4 | 8,531 | 19% | 90% | 90% | |
| Kapolei 2 Tsf | 14,981 | 31% | 95% | 96% | |

Circuit/Transformer Loading under Contingency Condition (Percent)

| Contingency | Rating KVA | 2018 Peak | 2022 Peak | 2023 Peak |
|----------------|---------------|-----------|-----------|-----------|
| Ewa Nui 1 | 10,670 | 68% | 105% | 106% |
| Ewa Nui 2 SB | 10,670 | 0% | 0% | 0% |
| Ewa Nui 1 Tsf | 16,156 | 27% | 69% | 70% |
| Ewa Nui 2 | 10,670 | 51% | 112% | 151% |
| Ewa Nui 3 SB | 10,670 | 0% | 34% | 34% |
| Ewa Nui 2 Tsf | 16,156 | 33% | 97% | 144% |
| Kaloi 1 | 10,670 | 4% | 67% | 187% |
| Kaloi 2 | 10,670 | 0% | 82% | 83% |
| Kaloi 1 Tsf | 16,156 | 3% | 94% | 172% |
| Kaloi 3 | 10,670 | 0% | 41% | 123% |
| Kaloi 4 | 10,670 | 0% | 0% | 0% |
| Kaloi 2 Tsf | 16,156 | 0% | 28% | 81% |
| Kamokila 3 | 9,093 | 40% | 90% | 98% |
| Kamokila 4 | 9,093 | 43% | 87% | 101% |
| Kamokila 2 Tsf | 16,156 | 43% | 83% | 96% |
| Kapolei 3 | 10,670 | 26% | 63% | 63% |
| Kapolei 4 | 10,670 | 29% | 112% | 124% |
| Kapolei 2 Tsf | 16,156 | 36% | 111% | 119% |

Table below shows the existing customer count for residential and commercial type customers on circuits and transformers related to NWA needs.

Existing Customer Count and Customer Type for Circuits and Transformer related to NWA Needs

| Circuit / Tsf | 2019 Residential | 2019 Commercial | Comments |
|---------------|---------------------|--------------------|-------------------------------------------------------------------------|
| Ewa Nui 1 | 1,308 | 88 | |
| Ewa Nui 2 SB | 0 | 0 | |
| Ewa Nui 1 Tsf | 1,308 | 88 | |
| Ewa Nui 2 | 1,135 | 71 | Current customers to be offloaded to provide capacity for Ho'opili area |
| Ewa Nui 3 SB | 0 | 0 | |
| Ewa Nui 2 Tsf | 1,135 | 71 | |

| | | | |
|----------------|-----|-----|---------------------------------------|
| Kaloi 1 | 0 | 10 | |
| Kaloi 2 | 0 | 0 | |
| Kaloi 1 Tsf | 0 | 10 | |
| Kaloi 3 | 0 | 0 | |
| Kaloi 4 | 0 | 0 | |
| Kaloi 2 Tsf | 0 | 0 | |
| Kamokila 3 | 1 | 55 | Customer count for NWA customers only |
| Kamokila 4 | 744 | 236 | |
| Kamokila 2 Tsf | 745 | 291 | |
| Kapolei 3 | 0 | 104 | |
| Kapolei 4 | 435 | 101 | |
| Kapolei 2 Tsf | 435 | 205 | |