

IGP Distribution Planning Working Group Meeting
Thursday, March 5, 2020
9:00am – 1:00pm
American Savings Bank Building, Training Room 1

Attendees

In-Person

Marc Asano, HE
Scott, LoadSEER
Alan Hirayama, HE
Nohea Hirahara, HE
Vladimir Shvets, HE
Amanda Yano, HE

Sorapong Khongnawang,
HE
Jay-Paul Lenker, HPUC
Clarice Schafer, HPUC
Grace Relf, HPUC
Gina Yi, HPUC

Andrew Okabe, DCA
Robert Harris, Sunrun
Randal Lui-Kwan, HE
Gary Fukumoto, HE
Anthony Hong, HE

WebEx

Alex de Silva, Arizona
Public Service
Ali Ipakchi, OATI
Andre Bisquera,
Honeywell
Bill Zastrow, WZ
Engineering
Sue Cagampang, Puget
Sound Energy
Cameron Feil, Geotab
Caroline Carl, Hawai'i
Energy
Christopher Lau, HE
Curt Leyshon, Itron
Colin O'Brien, Puget Sound
Energy
Daniel Haughton, Arizona
Public Service
Dean Nishina, DCA
Dennis Flinn, Quanta
Technology

Donald Hall, Quanta
Technology
Enrique Che, HE
Eric Kunisaki, HE
Gerardo Sanchez, Quanta
Technology
Greg Shimokawa, HE
Isaac Kawahara, HE
Joanne Ide, HE
John Cole, HNEI
Jorge Matheus, Matmor
Julio Romero Aguero,
Quanta Technology
Kathy Yonamine, HE
Keith Block, Hawai'i
Energy
Ken Aramaki, HE
Li Yu, Quanta Technology
Liza Jang-Che, HE
Marisa Chun, HE

Martin Solis, Arizona
Public Service
Melanie Higa, HE
Nelson Bacalao, Siemens
Paul De Martini, Newport
Consulting
Reid Shibata, Puget Sound
Energy
Rene Kamita, DCA
Richard Vandrunen, HE
Riley Ceria, HE
Robert Zavadil, EnerNex
Steven Rymsha, Sunrun
Susan Chow, HE
Sylvia Gard, Puget Sound
Energy
Therese Klaty, HE
Yoh Kawanami, HE

Objective

- Discussion on how the LoadSEER tool will be utilized to generate circuit level forecasts for use in the distribution planning process to identify grid needs.

Agenda

- Welcome
- HECO LoadSEER 2020 Presentation

Key Takeaways

- Underlying mechanism for DER Forecasting with LoadSEER
- High level details of forecast layer development (EV, Weather, General Growth, Demand Side Management, Distributed Generation, Energy Efficiency)
- Walk through of LoadSEER program interface and available modules

Discussion

I. Soft Launch Update

- a. Hawaiian Electric Integrated Grid Planning (IGP) “Soft Launch” RFP Debrief Session
 - i. Date: Monday, March 9, 2020
 - ii. Time: 2 p.m. to 4 p.m. HST
 - iii. Location: American Savings Bank – 8th Floor (Conference Room 2)
- b. Please contact Isaac Kawahara at Isaac.kawahara@hawaiianelectric.com for WebEx registration information.

II. HECO LoadSEER 2020

- a. Methodology
 - i. Stakeholder:
 1. Speaker: The load can be optimized by individual load shapes provided by customers/developers.
 - ii. Stakeholder:
 1. The forecasts are constrained by what is developed in the FAWG. Where do the sensitivities developed by SEOWG come into play?
 2. Speaker: If there is a high DER uptake assumption, we can use that in the model as a customer adoption option. Changing the rates is one way we can test the benefit to cost calculation for the customers.
 - iii. Stakeholder:
 1. There are some sensitivities discussed in SEOWG. How are we going to model them here? Are you looking at the secondary level? For example, the propensity to overload a circuit.
 2. Speaker: The same assumptions can be incorporated into the LoadSEER model by changing the constraints in the model. The main challenges depend on how you bring in customer level targets and rates into the model. The idea is to properly

accommodate customer-level sensitivities. Additional challenges come with EVs, since we may not know who exactly has them

- iv. Stakeholder:
 - 1. Does LoadSEER model dispatchability? Some programs may go before other programs.
 - a. Speaker: What we do in LoadSEER helps us model forecasted customer adoption, but the costing and dispatching is done in RESOLVE and PLEXOS. At this point, we are not planning to use LoadSEER for dispatch. The modeling and dispatch details could be brought in from PLEXOS.
 - v. Stakeholder: One of the SEOWG sensitivities looked at customer battery behavior on low grid-scale PV and wind days.
 - 1. Speaker: We want to define the size of the load and then define the different types of battery shapes. If there are proposed customer loads that you want to test, you can email it to the DPWG contact for analysis.
 - vi. Stakeholder: Are there plans to address load shaping based on economic changes?
 - 1. Speaker: The idrop software sends the signal and applies it to LoadSEER as a day-ahead forecast. Similar to modeling the DSM. The model is theoretical least-cost forecast.
 - vii. Stakeholder: The spikes that you are seeing at the top, is this your cumulative total?
 - 1. Speaker: It takes the AMI data for the most recent years. For every feeder, we run it through the model. The purple line is derived from the 2013 studies – older studies.
 - viii. In LoadSEER it's possible to turn off the generator portion of a paired resource and only run the battery unit.
 - ix. Essentially, it's very difficult to simulate battery load shapes because they can vary based on a lot of factors, such as variability in the paired resources.
- b. Mapping
 - i. It's possible to update layers of the map to add or remove resource potential locations, as the information becomes available to HECO and external parties. Maintaining the mapping will improve the accuracy of the analysis.
- c. LoadSEER Allocation Framework
 - i. Has the ability to build in layers for various forecasts, including EVs.
 - ii. The bottom-up approach is being analyzed, and it involves a lot of feeder data input.
 - iii. Stakeholder: What type of TOU is being modeled?
 - 1. Speaker: This is an annual update of AMI meter data, from HECO's TOU residential customers.

- iv. Customer adoption of a renewable resource or program enrollment can be added to the model and the effects to the circuit can be modeled. It's helpful to have more data on customer load shapes.
- v. Stakeholder: Why would you add TOU to a customer with PV? Why would the load become more extreme in the chart?
 - 1. Speaker: It's important to not just take the baseline and add PV to it, we have to look at the deltas between customers with TOU.
 - 2. Stakeholder: Is this the data of one customer or an average?
 - a. Speaker: It is an average.
- d. Customer Load Shapes
 - i. The model has the ability to identify hourly periods of overloads on a feeder. We can aggregate the overloads to develop the distribution needs.
 - ii. Stakeholder: How do you presume to look at battery adoption and how could that could input that into the model?
 - 1. Speaker: The idea is to run the model with residential customers with and without PV + battery. Right now, we're just looking at PV only. We create load shapes for different combinations of PV and battery, as well as different load shapes for the battery. It's important for the analysis to consider load shapes that appear to perfect in charging/discharging behavior and question it.
 - 2. Stakeholder: What about TOU?
 - a. Speaker: We want to continue modeling different load shapes with TOU to ensure the data is reasonable.
 - iii. Stakeholder: There has been some data out there showing a correlation between PV adoption and EV adoption. How would you capture that in the model?
 - 1. Speaker: We can develop forecasts where a customer picks up PV in one year and then we delay the adoption of an EV to a later year.
 - iv. Stakeholder: We often see a chunking of PV and EV installs.
 - 1. Speaker: We can model the peer-effect, showing the correlation between adding different resources on residential and commercial locations over time, with time lags for new capacity. It's nice that we can turn on individual resources at the feeders and power flow analysis.
- e. LoadSEER Live Demo
 - i. Stakeholder: Would adjustments to energy efficiency (EE) be something that was coordinated with Hawai'i Energy? How do you assume EE?
 - 1. Speaker: We prefer to treat it as an itemized load shape. We can take forecasts and inputs from Hawai'i Energy, and/or make assumptions on the uptake of EE in a particular circuit.
 - ii. Stakeholder: Is this actual data or just a demo?
 - 1. Speaker: This is based on historical loads.

- iii. Stakeholder: What would you use for the actual modeling data?
 - 1. HECO: We would use historical base loads. Then we'd build upon that with forecasts and customer usage through AMI meter data. There would have to be some assumptions for energy efficiency data.
- iv. Stakeholder: What are you assuming for the customer loads?
 - 1. HECO: Right now, we have a generic residential and commercial customer load shape in LoadSEER. With more data collection we can create different customer classes of data to be more specific. An example of other types of data would include adding more fueling stations or the rail to a map and showing how that impacts power flow needs and the impact to certain classes of customers over time.
- f. Graphical Database
 - i. Hierarchies can be created for cities or groups of major infrastructure or transportation roadways. For example, having one chunk of data to represent downtown Honolulu.
 - ii. The model ties the forecasts to the grid, which is essential for distribution planning to identify the impacts would be on a circuit and neighboring circuits in an N-1 situation where there is a loss of a generator.

III. Additional Comments

- a. Stakeholder: How does your team think about dividing up this work?
 - i. HECO: We do distribution planning by different parts of the island. It's split up by different types of electrical systems, and different planning groups will review different parts.
 - ii. Speaker: There is calibration based on proximity factors between where components are located.
- b. Stakeholder: How many other utilities use LoadSEER?
 - i. Speaker: About 10+ utilities currently use LoadSEER, some of the larger utilities (e.g., California utilities) or those with large geographical areas with large customer growth and city development. O'ahu is a great area for using LoadSEER to analyze load shapes.
 - ii. HECO: For the IGP, we worked with LoadSEER to refine the N-1 constraint for the model.

DPWG – Meeting Topics & Schedule

March 2020	<ul style="list-style-type: none">• Soft Launch Update• HECO LoadSEER 2020
End of March, TBD	<ul style="list-style-type: none">• Revisit Topics/ Review Deliverables• Finalize Deliverables

Next Steps/Meetings

- Soft Launch Debriefing Session and Next Steps, March 9, 2020
- Review DPWG Deliverable Comments, End of March
- Questions and comments may be submitted to Marc Asano at, marc.asano@hawaiianelectric.com or igp@hawaiianelectric.com.