IGP Solution Evaluation and Optimization Working Group (Meeting #11)
Friday, May 22, 2020
9:00am - 11:00am
WebEx

Attendees
WebEx

Christopher Lau, HE
Dale Murdock, EnerNex
Roderick Go, E3
Aryeh Gold-Parker, E3
Roderick Go, E3
Addison Lee, HE
Isaac Lum, HE
Clarice Schafer, HPUC
Jay Paul Lenker, HPUC
Gina Yi, HPUC
Mike Wallerstein, HPUC
David Parsons, HPUC
Grace Relf, HPUC
Marcey Chang, DCA
Rene Kamita, DCA
Lisa Hiraoka, DCA
Dean Nishina, DCA
Michael Schwing,
Robert Harris, Sunrun

Steven Rymsha, Sunrun
Wren Wescoatt,
Progression HI Offshore
Wind
Noelani Kalipi, Progression
HI Offshore Wind
Jeremy Laundergan,
EnerNex
Paul De Martini, Newport
Consulting
Christopher Yunker, HSEO
Gerald Sumida, Carlsmith
Ball/ Ulupono
Diwakar Tewari, Leidos
Christopher Kinoshita, HE
Amanda Yano, HE
Sorapong Khongnawang,
HE
Brian Lam, HE

Ken Aramaki, HE
Marc Asano, HE
Joanne Ide, HE
Therese Klaty, HE
Robert Uyeunten, HE
Dean Oshiro, HE
Richard Wang, HE
Kenton Suzuki, HE
Chris Antonio, HE
Daniel Lum, HE
Greg Shimokawa, HE
Isaac Kawahara, HE
Christin Chang, HE
Yoh Kawanami, HE
Nohea Hirahara, HE
Marisa Chun, HE
Meredith Chee, HE

Agenda

- Welcome and Ground Rules
- Quick Review – Where We Are Today
- Grid Services Review
- Next Steps

Objectives for Today's Meeting

- Summarize progress made to date
- Introduce the Energy Reserve Margin Grid Service
- Review Methodology for Load Build and Load Reduce Grid Services
- Review relationship between resources and grid services

Discussion

I. **Review of SEOWG Discussions – Where we are today**
   a. No Comments.

II. **Capacity Planning Criteria: Energy Reserve Margin**
   a. Objectives
      i. Introduce a resource planning criteria that analyzes contributions from diverse generating portfolio for planning purposes.
      ii. Illustrate the concept and use of an Energy Reserve Margin criteria for capacity planning purposes.
   b. Stakeholder: Is HECO still considering loss of largest generator on Oahu = 180 MW (AES)?
      i. HECO: Yes, for Oahu, AES is our largest unit. As the units change, AES will not always be the largest unit. If AES is on maintenance outage, the next largest unit will be Kahe 5 and 6. However, as we integrate more renewables, there will be a shift in how we will plan for this, which is where the Energy Reserve Margin comes in.
   c. Stakeholder: What is the difference between an interruptible load and shifted load? What resources are involved?
      i. HECO: The interruptible load would represent distributed resources in a demand response program. The shifted load would represent load shifting by energy storage systems.
   d. Stakeholder: Are there contract limitations that control which loads can be interrupted?
      i. HECO: Yes, that is correct.
   e. Stakeholder: Would the ERM consider sub-hourly modeling?
      i. HECO: We've found that increasing the number of data points at the peak by going from an hourly scale to sub-hourly scale has not shown a significant difference in the model results and lengthens the run time.
      ii. Stakeholder: It makes sense that the ERM is being used for capacity planning, and not a minute-by-minute operational behavior analysis.
   f. Stakeholder: For the Hourly Dependable Capacity (HDC), are you still considering paired renewables as having the same energy as unpaired?
      i. HECO: The PV in a paired or unpaired system would be constrained by the HDC. In a paired system, the battery would be limited by the energy provided by the PV.
   g. Stakeholder: For the shifted load and interruptible load, is there going to be an evaluation of the dependability of that resource or program when performing that calculation?
      i. HECO: Are you asking if there is a reliability calculation for the ERM?
      ii. Stakeholder: Yes, for the customers in the interruptible load program, this applies, but if they are not in one of those programs, how can you depend upon the availability of those resources?

1. HECO: If a resource that was interruptible is no longer interruptible (e.g., maintenance outage), then the remaining resources would need to pick up the load in the ERM.
   iii. Stakeholder: How did you come up with the ERM target of 30% on Oahu, Hawaii, and Maui?
      1. HECO: We determined these targets after running multiple production simulations to analyze the system-level behavior.
      2. Stakeholder: Is the 30% related to peak?
      3. HECO: It is not necessarily related to the peak, although the ERM does include the peak. It is the required ERM for every hour of the day.
      4. Stakeholder: Are you saying we need 30% reserves above demand in any hour?
      5. HECO: Yes.
   iv. Stakeholder: I appreciate the intent here in planning for the future capacity, especially with the change in resource mix. Can you please talk about how this criterion will be used? Is it an on/off factor, as long as it's met then nothing else happens? Or does mean that if the ERM is not met, then we would need to add capacity?
      1. HECO: In RESOLVE, the ERM criteria will be solved for along with the other reserve requirements as the model develops the resource portfolio.
      2. Stakeholder: But RESOLVE doesn't model every day and year? How would we know if the target is missed in one hour, does that trigger new resources? Is it allowed to miss it a few hours per year?
      3. HECO: PLEXOS will be run after RESOLVE to identify any shortfalls.
      4. E3: We are running an 8760 hours/year in RESOLVE to meet the ERM, and it is implemented to ensure there is no unserved energy according to the ERM.
   v. Stakeholder: Is the 30% capacity or energy?
      1. HECO: It's both. You might not have that capacity in that hour, but you can shift the energy within that hour from another resource(s).
      2. Stakeholder: How does this compare to what you use now?
         a. HECO: This exceeds what we use now.
      3. Stakeholder: What is it today?
         a. HECO: Currently, we maintain the 20% for Hawaii and Maui, and Oahu doesn't use a margin.
         b. Stakeholder: Does the loss of the largest unit covered in that margin?
         c. HECO: Yes, the margin covers loss of largest unit and other contingency conditions.

vi. Stakeholder: What did you set the number of standard deviations to in this analysis?
   1. HECO: We tried to find the right balance between reliability and the capacity of the resource. Two standard deviations for solar, 97% probability available (not as variable), and one for wind (more variable).
vii. Stakeholder: Is one of the changes that all hours are considered in this new criteria?
   1. HECO: The ERM no longer looks just at the peak, but by definition includes the peak.
   2. Stakeholder: The ERM will look at the hourly demand across different periods?
      a. HECO: Yes.
viii. Stakeholder: In slide 16, if you were to calculate the left-hand side more stringently, you would need to look at the effect on the right-hand side of the ERM calculation.
   1. HECO: Some of the data for uninterruptible load is not available, but as it becomes available, we can update the calculation.
ix. Stakeholder: Have you tried using the ERM for new resources?
   1. HECO: We're still testing and building this into the models and haven't done any portfolio evaluations.
   2. Stakeholder: Is this going to increase the demand?
      a. HECO: In all hours, it should increase the load on each island by the ERM percentage.
x. Stakeholder: Is this intended to improve upon RESOLVE's forecast?
   1. E3: Could you please clarify what is meant by forecast?
   2. Stakeholder: You're not able to match up the forecast for the solar with what actually shows up in the model.
   3. E3: RESOLVE uses historical data for capacity planning.
xi. Stakeholder: Can RESOLVE consider demand response?
   1. HECO: Yes, there is a mechanism to account for demand response.
   2. E3: Yes, RESOLVE models demand response as a load modifier.
   3. E3: Demand response can show up in the operational aspect to provide hourly load.
xii. Stakeholder: Does RESOLVE consider geographic diversity?
   1. HECO: Yes, the HDC captures the geographical needs by island.
   2. Stakeholder: I was thinking more specifically, would it tell us where specific resources would be best located?
   3. HECO: The NREL Resource Potential Study describes areas on the islands where there is available land to develop new resources.
   4. Stakeholder: Yes, but more so where is the best places to interconnect resources? It sounds like this doesn't depend on that constraint.

        xiii. Stakeholder: Do the RESOLVE results provide an idea of resource diversity?

               1. HECO: There are a couple of sensitivities we are looking at where we consider periods of low renewable generation from PV and wind. In the NREL Potential Study that's being updated, they will be revising the potentials for PV and wind. This would be combined with the costs of new transmission to interconnect these potential resources in the models to assess viability of renewable energy zones on each of the islands.

III.   **Load Build and Load Reduce**

    a. Load Build: Capacity that can be provided by storage or controlled load to increase system load in the required timeframes and durations in response to a remote dispatch signal.

    b. Load Reduce: Capacity that can be provided by a generator, storage or controlled load to reduce system load in the required timeframes and durations in response to a remote dispatch signal.

    c. Stakeholder: How did you determine 5 years for the avoided costs?

        i. HECO: It aligns with the work in RESOLVE, where we model a set of representative days every 5 years.

    d. Stakeholder: Is the ERM target timeframe also set for 5 years?

        i. HECO: We are running RESOLVE every 5 years operationally, but we are considering the 8760 for capacity planning.

    e. Stakeholder: Is the ERM an average over 5 years?

        i. HECO: It's a target. RESOLVE is solving every 5 years, however all the portfolios coming out of RESOLVE will be fed into PLEXOS to run the hourly production simulation and to double check the portfolio and ensure that we continue to meet the criteria.

        ii. E3: The 5-year marks are milestones in the RESOLVE model. It ensures that the resources selected meet the ERM requirement, and we can fill in the intermediate years.

    f. Stakeholder: How does unit retirements affect the ERM in the 5-year period?

        i. HECO: It's not necessarily the targets would change, but the part of the ERM which captures the loss of the unit, the largest unit will become a different or new resource.

    g. Stakeholder: Storage and controllable load is a way of doing load build service, but wouldn't curtailment of DER also contribute to load build?

    h. Stakeholder: Are you saying that resources need to provide ERM 8670 hours/year?

        i.   HECO: Yes.

        ii.   Stakeholder: Would like to see analysis behind the ERM.

i.   Stakeholder: What would be the dependability factor for the load build and load reduce services?

        i.   HECO: It would be accounted for in the ERM.

        ii.   Stakeholder: Shifted load for example, a solar plus battery DER project, how would this be accounted for?

        iii.   E3: It sounds like there is some confusion between energy and ERM?

        iv.   HECO: We are talking about two different things, where the ERM is for capacity planning, and for the load build/load reduce service this is based on marginal cost.

        v.   Stakeholder: Is ERM for reliability and load build/reduce for economics?

            1.   HECO: Yes.

        vi.   Stakeholder: Are you saying that in the ERM, you're ensuring you have enough capacity for reliability purposes? Load build and load reduce is an economic modifier?

            1.   HECO: Yes, load build and load reduce is trying to improve and reduce system costs.

j.   Stakeholder: It seems like using the ERM in RESOLVE means that if there is a shortfall in energy or capacity, then the model will decide to build a new resource to supply it?

        i.   HECO: Yes.

k.   Stakeholder: By building the resources to meet the ERM, would it then mean that the overall marginal costs are also reduced?

        i.   E3: Yes, RESOLVE is solving for a least cost portfolio.

l.   Stakeholder: Why do the ERM? Why not just continue on with what you're currently doing and just build what you need?

        i.   E3: In the event of a contingency, building for reliability will address that. The goal would be to reflect both a system designed to have a capacity margin and look at the provision of energy in every hour.

        ii.   Stakeholder: How do we know how much capacity we should consider?

        iii.   E3: We translate what HECO tells us in terms of the capacity and energy requirements, the model itself doesn't know why we have these requirements, only that it needs to model them. That's where the stakeholder input comes into play here, where you tell us if this makes sense or needs to be adjusted.

        iv.   HECO: We're planning on sending out the SEOWG deliverable with more information.

IV.   **Proposed Grid Services for IGP**
   a. Stakeholder: Have you included any energy efficiency in terms of grid services?
      i. HECO: We haven't considered energy efficiency as a resource. However, we are incorporating that as an input in the sales forecast.
   b. Stakeholder: Is the energy efficiency a kWh off the top, or is it only during certain times of the day? Meaning, is it an overall reduction in system load or only during the peak? How is it used?
      i. HECO: We have profiles for energy efficiency from AEG, so we are capturing it in every hour.
   c. Stakeholder: Are non-wires alternatives captured?
      i. HECO: The resource procured for transmission capacity and distribution capacity grid services would defer traditional wires solutions.
   d. Stakeholder: What is PSS\E and PSCAD?
      i. HECO: Those are transmission planning models.

V.   **Solution Sourcing Process**
   a. No comments.

VI.   **Additional Comments**
   a. No comments.

Next Steps

- Next meeting: Tuesday, June 30, 2020
   o Time: 1:00pm – 3:00pm
   o Location: WebEx
- Release next draft of SEOWG deliverable week of May 25th
- Schedule June meeting to discuss transmission needs and stakeholder questions and comments
- Finalize SEOWG deliverable by end of June
- Feedback may be submitted to – IGP@hawaiianelectric.com, or Chris Lau christopher.lau@hawaiianelectric.com