

IGP Stakeholder Council Meeting

Tuesday, November 9, 2021

9:00am - 12:00pm

WebEx

Attendees

Aaron Lau, DoD
Abel Siu Ho, HE
Aidan Tuohy, EPRI
Alex de Roode, COM
Andy Hoke, NREL
Audrey Newman
Barry Usagawa, BWS
Brad Takahashi, DOD
Brian Lam, HE
Bryant Komo, HE
Chris Yunker, HSEO
Christopher Kinoshita, HE
Christopher Lau, HE
Clarice Schafer, HPUC
Collin Au, HE
Colton Ching, HE
Corey Shaffer, Verizon
David Parsons, HPUC
Dean Nishina DCA
Eric Nakagawa, COM
Francis Alueta, Hawaiian Telcom
Gary Ting, DoD
Genevieve Sullivan, DOT
Gina Yi, HPUC
Greg Shimokawa, HE
Henry Curtis, LOL
Herman Andaya, CoM
Isaac Kawahara, HE
Jacqui Hoover, HIEDB
James Abraham, HE
Janet Yocum, FEMA
Jennifer Walter, C&C of Honolulu
Jeremy Laundergan, EnerNex
Jerry Sumida, Carlsmith Ball
John Bravender, NOAA
Jonathan Chin, HSEO
Jonathan Choi, Par Pacific
Kahikina Burgess, HE
Keith Okamoto, DWS
Keith Yamanaka, DoD
Kelton Wong, DOD
Ken Aramaki, HE
Kevin Ihu, BWS
Kevin Waltjen, HE
Mahina Martin, HE
Marc Asano, HE
Marcey Chang, DCA
Mathew McNeff, HE
Kurt Tsue, HE
Mike Wallerstein, HPUC
Murray Clay, Ulupono
Noelani Kalipi, PHOW
Paul de Martini, Newport Consulting
Rebecca Dayhuff Matsushima, HE
Rene Kamita, DCA
Rick Pinkerton, HE
Riley Ceria, HE
Robert Harris, Sunrun
Robert Uyeunten, HE
Rod Aoki
Samantha Ruiz, Ulupono
Shereen Wachi, DoD
Terry Surlles, HNEI
Therese Klaty, HE
Tony Moiso, Pali Momi
Wren Wescoatt, PHOW

Discussion

- I. HE: While infrastructure is a big piece of resiliency, it's not the only piece. Others important pieces are cybersecurity, workforce training and preparedness in an emergency, agreements with partners to get assistance in an emergency, and inventory management and logistics.
- II. HE: We can think of damage prevention and consequence mitigation as two sides of a bowtie when it comes to improving resilience and addressing risk. On one side are solutions that prevent or minimize damage from different types of resilience threats (i.e. making the system stronger and better able to withstand extreme conditions). On the other side are mitigation solutions, which are solutions that lessen the impact when an incident occurs and allow the customers to still receive power while the grid is being restored (ex: backup generators and microgrids) In most cases, these two sides rely on each other.
 - a. HE: There are some types of preventive actions that harden existing critical backbone infrastructure against extreme events and climate change that we think the utility should start to implement in parallel with the IGP process.
 - b. Stakeholder: Climate change and the impacts that the grid may see is going to increase in severity and direction in ways that we don't fully understand. Since a lot of the critical infrastructures need electricity to perform, it's important to look at resiliency.
- III. Stakeholder: The reliability contributions of different generation technologies should include generation and storage technologies.
 - a. HE: Resilience covers a broad topic, but when we talk about reliability, there are different types. Last week, we discussed resource adequacy.
- IV. Stakeholder: Does fire impact resilience?
 - a. HE: Yes, wildfire impacts are considered part of resilience.
- V. Stakeholder: Did we come up with a definition of resilience for this group? I know one thing with the local government work we are doing is that others define resilience not only as shocks that come to systems but ongoing stressors such as poverty, lack of access to social services, etc.
 - a. HE: We do have some working definitions of resilience that we have discussed within the RWG group.
 - b. HE: Resilience is an objective that is more than just energy. It's just energy plays a key part in a community's resilience. While our definition is focused on energy, we agree that there is a broader definition that applies to communities. For our critical infrastructure, we have been thinking about resilience as the ability to anticipate, absorb, adapt, and recover from catastrophic events so that we can

continue to provide critical services. Those catastrophic events can be big events, such as hurricanes, as well as slow events that happen over time, such as sea-level rise.

- I. Stakeholder: PGE was very slow at mitigating the length of shutdowns vs San Diego Gas and Electric was more proactive and as a result had less duration shutdowns. Also think about which groups are going to be more critical, those are some of the things that need to be looked at.
- II. Stakeholder: I noticed that digitalization is not preventative, for example you can detect an underground fault before it happens. These should be included in one of these lists.
 - a. HE: Do you see that as more of a resiliency or reliability?
 - b. Stakeholder: I think it fits both.
- III. HE: Are there other infrastructure owners that want to comment?
 - a. Stakeholder: My biggest concern is poles. At risk for a 6 month restoration are the wooden poles. Fiber optics ride the poles and would probably need repair as well. I see the poles as the main problem and I don't see a simple hardening solution to that statewide. I think the most simple would be to go underground in key areas. Power and data go over these wooden poles.
 - b. Stakeholder: I think in general there are things that would be good to do. You can't do these things everywhere; big part is where you apply these and ensure that these investments are helping the social good.
 - c. Stakeholder: I agree with the weak link being the poles. I would like to understand how you understand criticality and power to specific sources. We have an important source that is not on a critical power pole, maybe we have to think of portable generation. We have to work a fire mitigation plan, the whole west side is subject to wildfire. There are power poles to our resources, watershed, farms, etc.
 - d. Stakeholder: Hawai'i does not have good Sat Phone coverage. If everyone were to use it, most of the calls would not go through.
 - e. Stakeholder: Our concern is the availability of equipment. For example, transformers and the amount of diversity from your substations. Some of our installations are fed from only one substation, and some of your substations have only one transformer. We're especially concerned about the transformers since those are long-lead items.
 - f. Stakeholder: Does the utility have anyone that directly liaisons with other service providers, like telecom and others both during an event and just in general?
 - i. HE: During an event, we have an IMT structure that can be integrated within a governments or other agencies, including other companies.
 - ii. Stakeholder: If the first time you call these other service providers is during disaster, you've waited way, way too long. I feel like convening a group that consist of related service providers and critical services that

talk regularly could help avoid a lot of issues when disasters actually do hit.

iii. Stakeholder: Do you have any planned exercises that you actually do with critical infrastructure to see how people responded to issues and how the different organizations work together?

1. HE: We do participate in a state exercise that includes government and many private infrastructure owners to drill a response to a various range of threats and disasters. It changes from year to year to exercise different types of responses, but we've been participating in that for some time. On a normal year, we typically do a couple response drills, internal to the company and on occasion will include other partners in our drills.

a. Stakeholder: This is really great discussion and I'd love to see one of those exercises with everyone's cell phone and internet going off.

2. Stakeholder: We closely coordinate with HECO during an event. During an emergency, the counties will be facing the issues and request for assistance will go from County to State to Federal.

IV. HE: Generally for our transmission work on O'ahu, you're looking at a 2-year lead time to get approvals, doing permitting, getting materials and construction.

a. HE: For critical pole hardening, you're looking at about 1% of your poles as meeting the criteria for being critical. For O'ahu, that would be around 6,000-7,000 poles. Just to put into reference, our ongoing asset sustainment efforts that does testing and treating of our wood poles on a periodic basis has us replacing around 1-2% of our poles each year. To replace all poles would take 50 – 75 years, so we have to have a targeted effort on which poles should be hardened first.

V. Stakeholder: How are microgrids being considered? Concerned about mission critical exercises. After 48 hrs of no power, we would need to relocate.

a. HE: Schofield is an example of a microgrid but as we look at solutions specific to microgrids it will vary, it can be large community microgrids, but could be larger or much smaller. It could provide generation to some end users.

VI. Stakeholder: Federal funding is hard to get, especially for hardening. The funds are allocated for specific things and can't be easily spent on other things.

b. Stakeholder: Time limits on federal funding to finish projects are impacted by regulatory approvals

c. Stakeholder: Money is always going to be an issue. Everybody thinks the Federal government has big, deep pockets, but it's deep pockets are spread all over the place.

VII. HE: Resilience, especially for our critical infrastructure, is around creating the ability to anticipate, absorb, adapt to, and rapidly recover from catastrophic events while

maintaining the mission critical functions that we need. The catastrophic events can be big disruptive events, like a hurricane, as well as slower, evolving events, like rising sea levels. Both can have significant impacts and both come at very different timelines.

- d. HE: We need to account for different kinds of threats with different timelines because our infrastructure typically has very long lives. As a result, we feel that we need to define resilience and develop plans for resilience that account for threats from the environment that may happen 30+ years into the future.

VIII. Stakeholder: I appreciate the recognition that there may be a slightly different standard of reliability/resilience for critical infrastructure; for example, a hospital that has a generator. My question is what do you think the utilities' role should be in aiding/encouraging/facilitating that type of resilience that's locally distributed that maybe offsets a need for some type of hardening elsewhere.

- e. HE: This is a topic that came up in the Resilience Working Group (RWG). I don't think there's a single universal answer. The discussion had in the RWG is that there are going to be opportunities for individual customers to make these kinds of resilience investments, and that needs to be coordinated with the utility. One of the big learnings and findings we had in the RWG, is a generator that may be used as emergency backup power needs to be able to provide that power over sustained period of time because it could take days/weeks for the grid to be back up.
- f. HE: Another important lesson from the RWG is how dependent different critical infrastructure/customers are upon each other. For example, we're dependent upon fuel supplies for power and roads/highway infrastructure to get access to our lines and poles, and others are dependent on us for power.
- g. HE: One thing we heard from several of our stakeholders is, even if they have emergency power, what they really need is full power to perform their critical role, and they're dependent upon HECO's timelines to get utility power back up for them to bring up their capabilities back to normal.

IX. HE: For transmission, whatever structure or lines we're hardening, we're looking at hardening to our internal Hawaiian Electric standard that looks at extreme wind loadings up to 120 mile per hour, which is a high Cat3 Hurricane. For distribution, if the pole is 60 feet above ground, it's about 105 mph wind speed. But for distribution hardening activities, when we look at critical poles, we apply these same wind speed standards for the poles regardless of the height standard.

- a. Stakeholder: Can you supply the cost of a pole to meet a Cat 1, 2, 3, 4, and 5 hurricane?
 - i. HE: There's a lot that would go into what that cost would be depending on whether its transmission or distribution and if it's in a difficult to access area vs right along the road. For a difficult transmission pole, it could be over \$700,000. For a transmission pole along the street, it

could be a couple hundred thousand for a steel pole. For a wood pole, it would be a lot cheaper.

- X. HE: Some of the factors that we're considering to determine which transmission poles should be hardened include what our transmission paths are to recover after a blackout and which paths are the cheapest to harden.
 - a. Stakeholder: If one of the renewable energy zones happens to be in an area that has older transmission, there might be a potential win-win to develop that REZ zone and put in brand new transmission with modern standards that may be more resilient. We've already seen comments whenever we talk about REZ because there's community concerns that there'll be more renewables in their neighborhood, but on the other hand, having brand new transmission close to where you live, could also mean better resilience for your neighborhood as well. We need to look at the positive aspect of some of these things.
 - b. Stakeholder: In terms of resilience, if we can see what transmission paths are deemed critical and being hardened, we can align our priorities to position our equipment.
- XI. Stakeholder: This has been a good discussion, but I think some of the comments that have been raised are along the same line of comments that were raised in the RWG in terms of identifying those critical centers that need the most attention and then trying to build partnerships, and then trying to help people understand the options and the associated costs. There is an urgency to figure out what needs to be done so that we can look at both the funding and the design sooner rather than later.
 - a. Stakeholder: RWG seemed more of a problem identification exercise and I think what this discussion is getting towards is what things do you have to do now to be in the problem-solving mode.
 - b. HE: As an example, using Hurricane Iniki, something on the order of almost 30% of their transmission poles and structures were damaged and needed to be repaired or replaced, over a third of their distribution poles needed to be replaced, and over a third of their distribution conductor needed to be replaced.

Presentation by Keith Yamanaka

- h. Stakeholder: Does the DOD anticipate running more black start drills? Lessons learned? Benefits of drill?
 - i. Stakeholder: Need a lot of qualified people. Personnel are not normally trained for this. DGPV is a challenge and actually prolongs re-powering.
 - ii. Stakeholder: It was difficult to get approval for this exercises, especially shutting power off to residents. Benefit became more apparent after the Texas ERCOT outage.
 - iii. Stakeholder: Are there opportunities for HECO to provide training to the Army or other groups? Turn off power and get experience re-starting generators?

1. HE: Recalling the 2006 outage where the utility was coordinating with customers with emergency generators. Most of those generators are not capable of operating in parallel with grid so the generators would need to be turned off to restore power from grid. Most of these emergency generators are done without utility coordination. Utility would want to coordinate with customers with larger loads.
 2. Stakeholder: A typical hospital generator doesn't power the whole hospital, so a test wouldn't cause interruption to everyone. A typical test is done monthly and the power outage is only simulated. A real drill would be very disruptive.
 3. SH: Did you try a test with the backup generators, not Schofield Generating Station? For other customers, scheduling a full-scale outage test is very difficult.
 - a. SH: An example is an outage on a submarine. Those outages are done without notice to crew. Another base has tried it. The Texas event showed lack of preparedness and that helped justify the Schofield test.
- XII. Stakeholder: We didn't really talk about how the pandemic affected us & whether that changes anything. Would like to have that discussion. One thing to note is oxygen supply, neither of the two air separation plants have emergency power. Without oxygen, hospitals & patients are at risk.
- XIII. Stakeholder: Did HECO complete the replacement of their trans-Koolau transmission towers? Huge multi-year project.
 - i. HE: Not yet. Structures were replaced under criteria described earlier. They were not built to enhance reliability. Least cost minimum integration.
- XIV. Stakeholder: Is the no-regrets resilience programs to being done in a regulatory procedure?
 - j. HE: The Company is planning to submit a PUC application sometime this year

Menti: What characteristics of a critical customer circuit would make it no-regrets to harden now?

- Add grocery stores, drug stores & hardware stores, & gas stations to Tier 2. All these are critical to communities helping themselves
- Hubs like shopping centers can be resources to the community
- Resilience hubs that serve the community in times of shocks and stressors
- Clarify that microgrids provide benefit to community and utility/broader system
- Areas that lack microgrid prevalence...other hardening or preventative measures
- Hardening usually results in larger/bigger poles which pose community concerns
- Radial circuits

XV. Stakeholder: What happens to large scale solar installations when they are hit by a large hurricane? Are these assets hardened enough?

Menti: How can we ensure all customers have equitable access to resilient electricity?

- Penalties for non-performance in PPA's (perhaps even in SIA's) for all resources.
- Prioritize local workforce so that we have the skills on island to respond when a disaster hits and are not dependent on outside expertise/staffing.
- Assuming HECO has done some analysis to support their proposed plan, loop in and educate legislators. Make them aware that resiliency options and equity have potential costs. Easy options that are no-regrets, low cost. Other options that are more difficult but better bang for the buck.
- Hardening, consider related systems like water.

XVI. HE: We learned similar lessons in a 2008 outage. When restoring power, we received feedback from the hospital not to put them as high priority because they did not have water.

XVII. HE: What's the best way to continue the reliability and resilience discussions?

- a. Stakeholder: We've had good discussions on reliability and resilience. Community relations and input would be good to discuss.

XVIII. HE: There will be customers that choose to put in their own backup generators. How can we extend that benefit to the broader community and avoid leaving more vulnerable communities behind when making resiliency investments.

- a. HE: One way to approach this is to focus on critical loads. Focus on time of restoration and reduce time from x days to y days. That's one way to measure performance. At the end of the day, this is being done for the customers that the utility serves. Prioritizing community needs could result in something different for each community. Call on stakeholders as representatives of their community and capture their perspectives.

XIX. Stakeholder: Talking of Cat 3 storm, you are going to recover power as fast as you can. When you're talking about equity amongst community, you are going to need to get most of the grid up and running. Unfortunately, that will leave certain communities behind. Recognize that is the reality. Serving all the communities equitably/concurrently may not be realistic.

XX. Stakeholder: I think the discussion of reliability and resilience would be an integral part of the IGP process as it will influence or affect generation, transmission, and distribution planning.

- a. Stakeholder: Integrate County and State climate action and resiliency plans into IGP.

XXI. Stakeholder: Is there a schedule or anticipated filing for resilience?

- XXII. Stakeholder: The Ko'olaupoko community resiliency effort that HECO has done should be recognized. It's a great process. Are there any plans to duplicate it for other communities?
- XXIII. SH: Agree with community engagement - early & often. For the Council, you've done a good job summarizing key points after each meeting which is very helpful. Could you also summarize "action items" or "next steps" as well, so it is clear what HECO (or others) are taking action on?

Next Steps

- Stakeholders may provide feedback on today's discussion to igp@hawaiianelectric.com.