

## Meeting Summary

### Innovation Pilot Framework (IPF)

#### Quarterly Stakeholder Meeting – December 2023

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Date: December 6, 2023

Location: Virtual – Microsoft Teams Meeting

[Meeting Slide Deck](#)

#### Meeting Takeaways

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- The purpose for this meeting is to openly discuss early pilot concepts under consideration by Hawaiian Electric for IPF.
- Project updates for current IPF projects (Charge Up E-bus, Charge Up Commercial, EV-J and EV-P tariff Pilots, Data Analytics Clearinghouse, and Residential EV Telematics), normally presented at these quarterly meetings, will not be reviewed during the meeting. However, quarterly project updates are provided in the meeting slide deck. If anyone has any questions on these updates, please contact us.
- Hawaiian Electric seeks stakeholder feedback and comments as it evaluates and further develops the following pilot concepts.
  - Falling Conductor De-energization
  - DER Insights
  - Immersive Learning using Virtual Reality
  - Hydrogen as a Grid Service
  - EV as Grid Service
  - DER Telemetry & Control
  - Virtual NEM
  - Linear Generator
  - Smart Load Devices
- There are no commitments to pursue any specific pilot concepts at this time. More engagement with stakeholders will be conducted during pilot development.

#### Innovation Pilot Framework (General)

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- The following information on the IPF can be found on Hawaiian Electric’s IPF website at: <https://www.hawaiianelectric.com/about-us/innovation/innovation-pilot>.
  - IPF process and portfolio, including the Areas of Collaboration that will guide the development of potential pilot projects
  - Submission of new pilot concepts and ideas for consideration
  - View approved and upcoming pilot projects with links to PUC’s Decision and Orders and Hawaiian Electric’s Notice of Intent (NOI), Responses to IRs, and slide decks for pilot projects
  - Presentation Slides and meeting summaries from Public Stakeholder Meetings
  - IPF Annual Reports
  - Schedule for future IPF meetings

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<sup>1</sup> Meeting notes reflect use of Chatham House Rule.

## Feedback on Pilot Pipeline

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- Hawaiian Electric continues to be interested in new ideas and project proposals for consideration from stakeholders. Submit project proposals to [innovation@hawaiianelectric.com](mailto:innovation@hawaiianelectric.com).
- Hawaiian Electric asked attendees if anyone had a pilot concept to introduce or discuss. No ideas were mentioned.
- One stakeholder indicated that they would refer service providers to our Innovation websites to bring new ideas for pilot concepts for consideration.
- Hawaiian Electric is exploring a new collaboration tool (Mural) for stakeholders to provide feedback. Anyone interested in using this tool needs to be explicitly added and should send an email to [innovation@hawaiianelectric.com](mailto:innovation@hawaiianelectric.com).

## Pilot Concepts

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### Falling Conductor De-energization

- New, developing technology being piloted by San Diego Gas and Electric (SDGE) and Southern California Edison (SCE) to detect a circuit conductor break and de-energize (isolate) the failed section before the conductor hits the ground.
- Requires new equipment to be installed such as synchrophasor technology utilizing phasor measurement units (PMUs), real-time automation controller (RTAC), GPS clock, segmentation devices, microprocessor relays, and fast (low latency) communications.
- Machine-to-machine communications to RTAC at substation for quick diagnosis and control.
- Involves testing in a lab environment and then in the field to assess the technology and private LTE network.
- Requires data collection and tuning to validate proper operations.
- Tentative schedule: 2024-2025.
- Discussion and Questions
  - Increases and enhances public safety.
  - Project is not included in Wildfire Mitigation Plans or Docket No. 2022-0135 since it evaluates a new and developing (not shovel-ready at this time) technology. The need for further testing and evaluation is the primary reason for conducting a pilot under the IPF.
  - Purpose is to test and determine how effective this technology is for Hawaii (e.g., versus California).
  - Technology Readiness Level (TRL) of this technology is currently low and more information on deployability is needed.
  - The pilot and private LTE communications were discussed by stakeholders.
    - Goals, metrics, and objectives for the pilot, including testing
    - Does Hawaiian Electric plan to expand its private LTE coverage?  
Response: Current understanding is that tentative schedule for expansion is 2024-2027. Hawaiian Electric is also considering pursuing federal grant funding.
    - Any existing docket for private LTE communications?  
Response (follow-up): At this time, there is no open docket for private LTE expansion.
    - Where will testing be conducted?  
Response: At this time, technology is envisioned to be lab-tested at Hawaiian Electric's Ward/Waiiau locations where private LTE exists.
    - Other pilot information should be developed such as what needs to be tested (specific components) and needed to make it deployable, what are the lessons learned from

SDGE, will the technology detect a broken conductor before it hits the ground, and does it cause mis-trips.

- Will RTAC detect and bring information back to EMA?

Response: Yes. RTAC is machine-to-machine and is the controlling device at the substation. Utility would block circuit breaker and send alarm to dispatch.

### **DER Insights**

- Develop new visualization tool that ingests geographic information system (GIS) and advanced metering infrastructure (AMI) meter data and distributed energy resources (DER) to identify any voltage issues and conditions (violations) and DER installations for the following:
  - Address power quality issues
  - Review and understand electrical demand usage and PV/battery system production
  - Calibration of distribution planning tools
  - Creation of future customer programs
- Discussion and Questions
  - Interesting concept.
  - Need to define end use cases, goals, objectives, and measures of success.
  - Pilot can gain understanding/verification of profiles through disaggregation.
  - Any overlap with EV telematics project?
  - Response: There is no overlap with the EV telematics project. DER Insights is looking to disaggregate AMI information using algorithms and machine learning to create a predicted curve of EV charging behavior. The information from the EV telematics pilot would be valuable to verify the accuracy of that predicted curve. As DER Insights disaggregation capabilities become more accurate as a result of this comparison, a profile of EV charging behavior can be created for those not participating in the EV telematics project.
  - What will be shared externally with stakeholders?  
Response: At this time, the data generated from DER Insights would be confidential and only utilized by Hawaiian Electric as it contains confidential information specific to customers. Part of the pilot could be to better understand if the data generated by DER Insights has value to external stakeholders and determine if this information can be made available.

### **Immersive Learning using Virtual Reality (VR)**

- New revolutionary training tool for employees that proposes to use VR for:
  - Existing training modules developed by/for Duke Energy
  - Customized field training developed for Hawaiian Electric
- Discussion and Questions
  - Interesting and innovative idea.
  - There is a need to bridge the gap between current classroom training methods to field training through VR.
  - The pilot should define metrics of success and compare differences between conventional and VR training.
  - Address how VR training can help with safety for linemen.
  - Can this VR training be used for live line training techniques?  
Response: This would be outside the scope of this pilot. We have not looked into this specific aspect but will generally say it is possible as there have been previous discussions with Virtual Crew about developing custom virtual reality training content based on Hawaiian Electric's training needs.

### **Hydrogen as a Grid Service**

- Looking at emerging technologies of using hydrogen to provide grid services through hydrogen generation capacity building or reduction.
- Project does not intend to invest in production of hydrogen as a fuel but instead leverage equipment (e.g., electrolyzer) that already exists here.
- Planning to investigate if hydrogen production equipment at UH-HNEI and NELHA (PV, battery, H2 production) is available. Planning to repurpose the existing electrolyzer at site.
- Hawaiian Electric will seek feedback on how to proceed.
- Discussion and Questions
  - Hydrogen should be green sourced.
  - Need to define use cases – capacity building or reduction not initially looking at frequency response.
  - Need to assess impact on hydrogen for transportation.

### **EV as Grid Service**

- Investigate emerging technologies in electrification as well as data sharing and analytics.
- Sacramento Municipal Utility District (SMUD) and Tokyo Electric Power Company (TEPCO) reached out to Hawaiian Electric to compare notes. Plan to leverage and share data and notes with SMUD and TEPCO on EV deployment to provide grid services.
- Explores framework and develop programs for vehicle-to-everything (V2X) to provide grid services.
- Discussion and Questions
  - Support utilization of customer batteries in EVs to support grid.
  - Residential focused only or includes public charging or commercial installation?  
Response: Project is residential focused but does not exclude commercial or government installations.

### **DER Telemetry & Control**

- Utilizes AMI network for DER telemetry and control to support grid reliability and determine if more efficient, reliable, and/or cost effective, and allows more participation.
- Combines inverter and meter communication on AMI network.
- Plan to test in a lab setting to determine performance.
- Determine costs to scale AMI network to include DER.
- Discussion and Questions
  - Project design to incorporate in Bring-Your-Own-Device (BYOD) program rather than compete with others in providing services.
  - How does it fit in private LTE communications?  
Response: Private LTE is meant to be complementary. Private LTE is being looked at for communications to distribution devices not extending into the home, whereas the AMI mesh network is designed to go all the way into the home (the customer edge (meter) and possibly past the meter).
  - Need to define end use cases (customer and/or distribution use cases).
  - Develop communication plan and define what it is supporting.

## Virtual NEM

- Looking to develop new model that leverages DER in multi-family homes, especially LMI customers.
- Explores solutions to more participation in DER by multi-family and LMI customers.
- Allow overbuilding of PV systems on multi-family buildings that serve common areas and extend the additional kWh to the tenants.
- Pilot will help determine if the concept is scalable and deployable.
- Discussions and Questions
  - Similarities/differences to community-based renewable energy (CBRE)?  
Response: Some overlap but Virtual NEM is focused on PV/BESS (generation) on-site vs. having customers subscribe to off-site PV/BESS like in CBRE.
  - Need to investigate customer preferences between Virtual NEM vs. CBRE.

## Linear Generator

- Proposes linear magnet generator instead of a rotating machine (generator).
- Similar technology used in emergency flashlights that you shake to power up the flashlight but uses a low temperature combustion process for a renewable fuel like green hydrogen.
- Assess and evaluate if linear generator is better (more efficient, cleaner by using renewable fuel, provide inertia, and be dispatchable) than rotating machine. Also, to assess hydrogen supply logistics.
- Discussions and Questions
  - Make and model in slides is manufactured by Mainspring Energy.
  - Similar in size to 20' shipping container.

## Smart Load Devices

- Expands smart load devices to include smart breakers for batteries, EV charging, and other devices as part of electrification.
- Project will help inform and evaluate feasibility.
- Allow to target specific devices that are hard-wired to these breakers.

## General Discussion

- Hawaiian Electric's funding in 2024-2025 is being prioritized, including pilot projects under IPF. As a result of the Maui wildfire in August, the Company's highest priority is public and employee safety. Other priorities include energy security, physical and cybersecurity, and reliability. Stakeholder feedback and comments are important, and Hawaiian Electric will continue to engage and meet with stakeholders as these pilot concepts are further developed.

**Next Quarterly IPF Stakeholder Meeting: March 20, 2024**