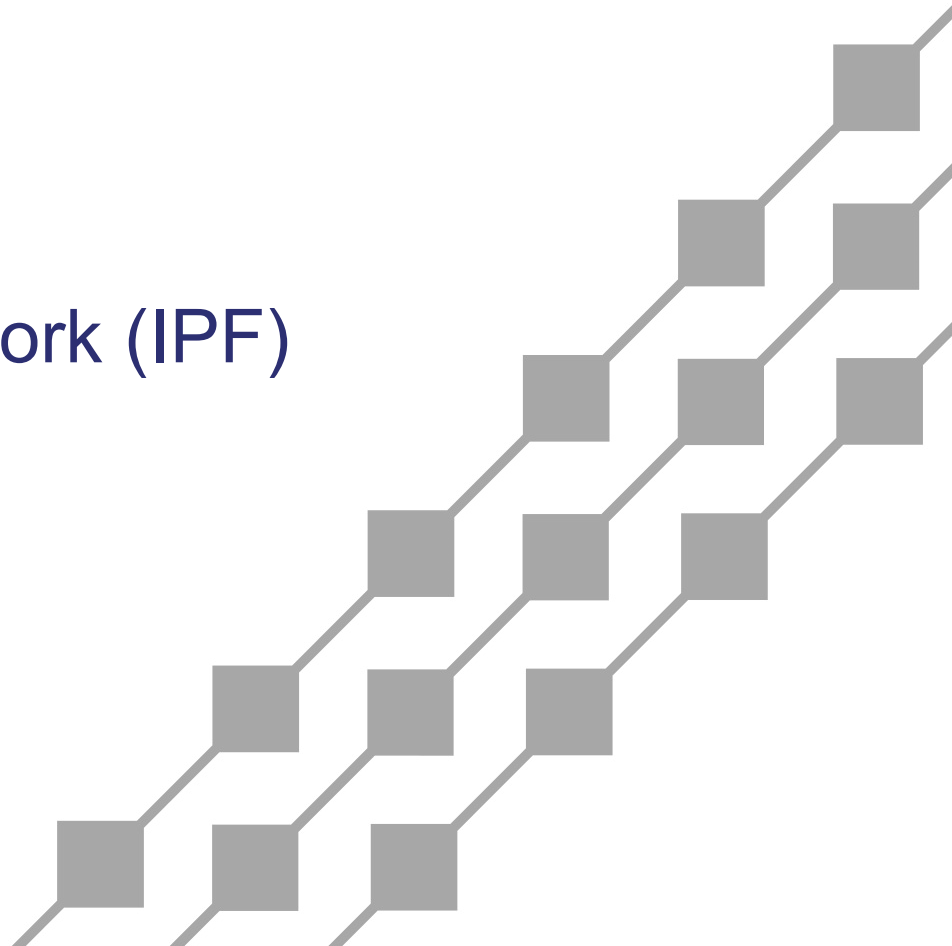




**Hawaiian
Electric**

Innovation Pilot Framework (IPF) Portfolio Update

September 6, 2023



Agenda

September 6, 2023 (1:00 - 2:30 PM HST)

- ◆ Welcome
- ◆ Open discussion on pilot concepts
- ◆ Provide status updates on approved pilots



Innovation Pilot Framework Website

Website: hawaiielectric.com/IPF

- General information
- Track progress of approved pilots
- Submit pilot ideas via the online form

Innovation

Our Process

Submit Ideas & Proposals

Innovation Pilot

Frequently Asked Questions

Contact Us

Innovation Pilot Framework

On December 23, 2020, the Hawaii Public Utilities Commission ("the Commission") issued a Pilot Process to "foster innovation by establishing that test new technologies, programs, business models, and other approaches that may be beneficial to customers."

This page provides links to the relevant orders establishing the Innovation Pilot, as well as links and information related to approved pilots.

Goals and Guiding Principles

This Framework will be guided, in part, by the Commission's overall goal of (1) a customer-centric approach, (2) administrative efficiency, and (3) the promotion of innovation. The Framework is designed to achieve the following guiding principles: Learning, Customer-Focused, Speed and Ownership. Learn more about the Framework in the Innovation Pilot Framework Workplan (Exhibit 1).

Areas of Collaboration (AOC)

Hawaiian Electric, in collaboration with the Commission, the Consumer Protection Board, identified the following Areas of Collaboration (AOC) under the IPF. In selecting projects under the IPF, we will give strong preference to projects that benefit Low-to-Moderate Income (LMI) customers from across the State.

Click below for a description of each AOC. To learn more about the IPF Workplan.

1. Decarbonization ▼

2. Customer Resources and Services ▼

Approved and Upcoming Pilot Projects

To maximize flexibility and foster innovation, we intend to utilize a variety of mechanisms to solicit pilot projects. These mechanisms include, but are not limited to, discussions and inquiries initiated by us or third-party stakeholders, public meetings, and formal requests for proposals.

VIEW PILOT PROJECTS

Public Meetings Related to Pilot Projects

As part of our ongoing commitment to transparency and sharing lessons learned about pilot projects, we will hold quarterly meetings. If you would like to be added to the mailing list and meeting invitations, please email innovation@hawaiielectric.com.

Date	Meeting Slides
9/6/23 at 1-2:30 p.m. HST	Pilot portfolio status update (PDF)
6/7/23 at 1-2:30 p.m. HST	Pilot portfolio status update (PDF)
3/8/23 at 1-2:30 p.m. HST	Pilot portfolio status update (PDF)
12/7/22 at 1-2:30 p.m. HST	Pilot portfolio status update (PDF)
8/31/22	Public stakeholder meeting to discuss the IPF (PDF)
6/1/22	Public stakeholder meeting to discuss the IPF (PDF)
10/19/21	Stakeholder engagement meeting (PDF)
9/28/21	Stakeholder engagement meeting (PDF)
9/7/21	Stakeholder engagement meeting (PDF)
8/24/21	Stakeholder engagement meeting (PDF)

Docket Filings and Workplan

- Innovation Pilot Framework Workplan (PDF)
- October 20, 2022 – PUC Order 38663 opening IPF repository
- October 20, 2022 – PUC Order 38665 establishing a protected pilot process

Pilot Projects Listings

The IPF process is described in the Pilot Process filed with the Commission on July 26, 2021. The Implementation Phase will include pilot proposals filed as Notice of Intent (NOI). Not all pilot concepts will be cost effective or show positive business cases, as assessing cost effectiveness of a scaled-up solution may be a pilot project's primary objective. The Implementation Phase will also include the execution of approved pilot projects, and the review of those approved projects for the purpose of shared learning and possible expansion.

This status board tracks the progress of new and upcoming innovation pilot projects.

Pilot Title	Status	Start Date - Target End Date	Actual/Total (thousands)	NOI/Order/Slides
Charge Up eBUS Make-Ready	Active	5/7/21 - 3/31/25	\$87k/\$4,232	D&O No. 37769 (PDF)
				\$0k/\$0 D&O No. 38157 (PDF)
				\$0k/\$4,984 D&O No. 38194 (PDF)
				\$0k/\$2,758 NOI (PDF) Slides (PDF)
				TBD Slides (PDF)

Submit Your Ideas & Proposals

Please use this form to complete a submission to Hawaiian Electric's Innovation team. All information submitted through the web portal should be non-confidential. At the end of the form, you may indicate that you are interested in participating in our Innovation Pilot Framework. Our team will review all submissions and distribute information internally within the company to the appropriate subject matter experts for an initial assessment. All personal data including your name, address, email address, and other information that you provide in your submission to our Innovation website will be kept confidential and used only for the purpose of processing and responding to your submission. If we are interested in learning more about your company, technology, or proposal, we will contact you to discuss how to proceed with next steps. Providing but not limited to execution of non-disclosure agreements, access credentials, negotiations, etc.

You will receive a direct email reply from the Innovation team within 10 business days from the date of your submission. For more information on these next steps, please see our process.

Contact Information: *

* First Name * Last Name
 * Title * Email
 * Business Phone * Mobile Phone
For non-US citizens or legal residents of the United States, please provide your country of citizenship or residency (for legal residents only).
 * Country (optional)

The following listing is provided to assist Hawaiian Electric in determining whether there may be relevant rules and regulations that may be applicable to your submission. Hawaiian Electric will not be responsible for the accuracy of your submission.

Company Information:

* Company Name
 * Business Address
 * City * State
 * Zip Code * Country
 * Business Website
 * Company Description
 No. of Full Time Employees:

Technology Innovation Idea/Product Submission:

A. Select the priority area and specify which initiative applies to your innovative technology or solution that meets our technology needs.





Pilot Pipeline

Innovation Pilot Framework (IPF) pipeline status board

Stage 1: New Ideas & Opportunities

Gate 1: Initial Screening

Stage 2: Sort & Refine Opportunities

Gate 2: Assessment Screen for IPF

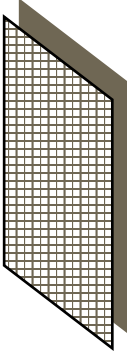
Stage 3: Prioritize & decide

Gate 3: Authorize & NOI

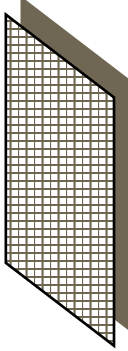
Stage 4: Execution

- Battery rental
- Virtual NEM
- Smart Electric Panel
- Veg Mgmt
- DER Telemetry & Control

1st Level Vetting



2nd Level Vetting



- Charge Up eBus
- Charge Up Commercial
- EV-J and EV-P Tariff Pilot
- Data Analytics Clearinghouse
- Residential EV Telematics





Project Updates

Key Takeaways

Status:

- Per D&O 40129 (July 28, 2023), Commission lifted the suspension on filing of pilot proposals (Notices) and elaborated on its expectations for the Innovation Pilot Framework

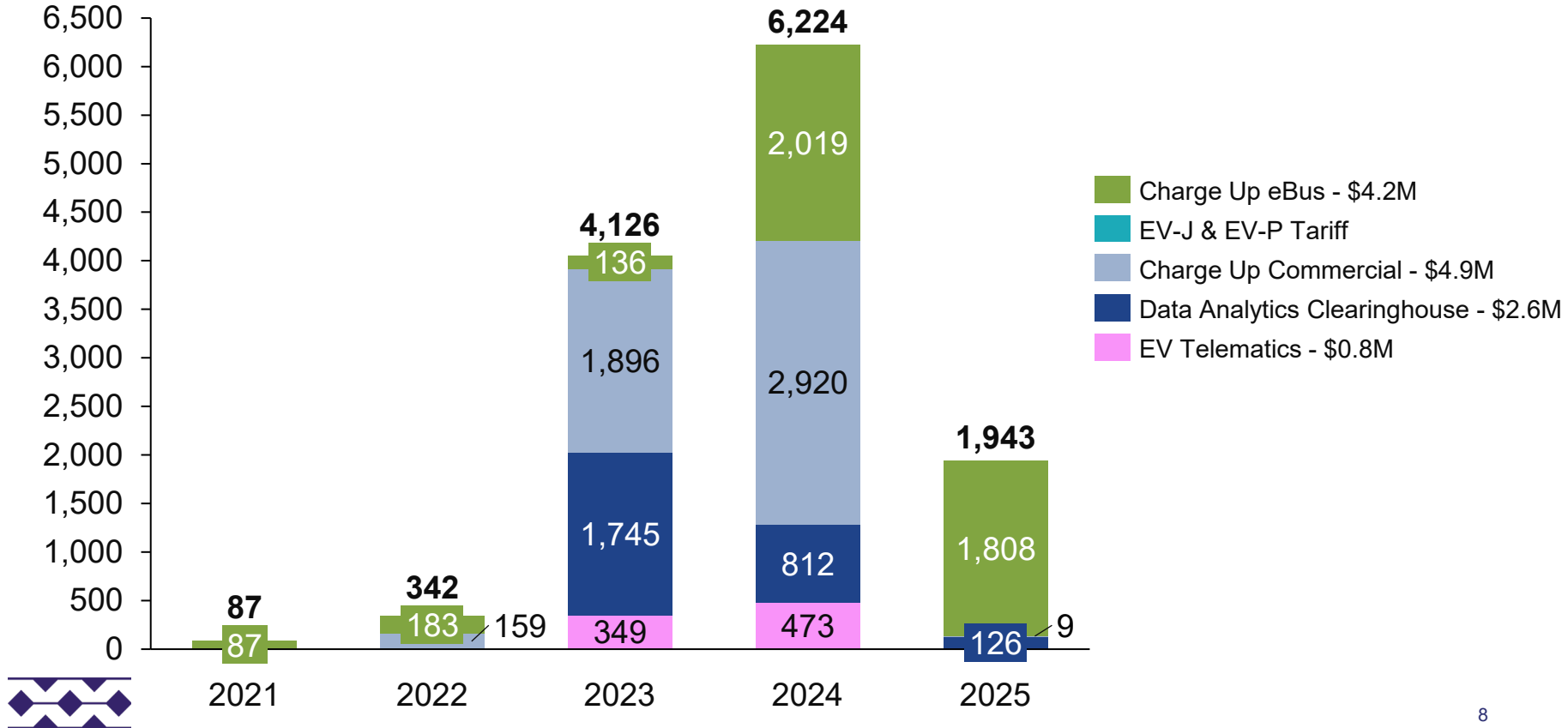
Active pilots:

- **Charge Up eBus** – **Green**: Fewer than expected applicants and bus operators. Changes to scope, schedule, and budget in response to customer feedback. Bus orders req. 18+ months lead time. PUC approved no-cost extension to 12/2025.
- **Charge Up Commercial** – **Green**: Evaluating and prioritizing sites for selection. Target 20 executed agreements by Q3.
- **EV-J and EV-P Tariff** – **Green**: Continued interest in enrollment, with pace limited by the installation of EV charging facilities. Working through hurdles and using a targeted outreach approach with interested customers.
- **Data & Analytics Clearinghouse (DACH)** – **Green**: Program Increment 01 completed 05/30. Program Increment 02 initiated 06/07 and on-track to complete, along with MVP-01, on 08/29.
- **EV Telematics (Smart Charge Hawaii)** – **Green**: Public facing website is live (<https://smartchargehi.ev.energy>) and signups are under way. Customer outreach is ongoing (HECO and ev.energy joint marketing, press release etc.).

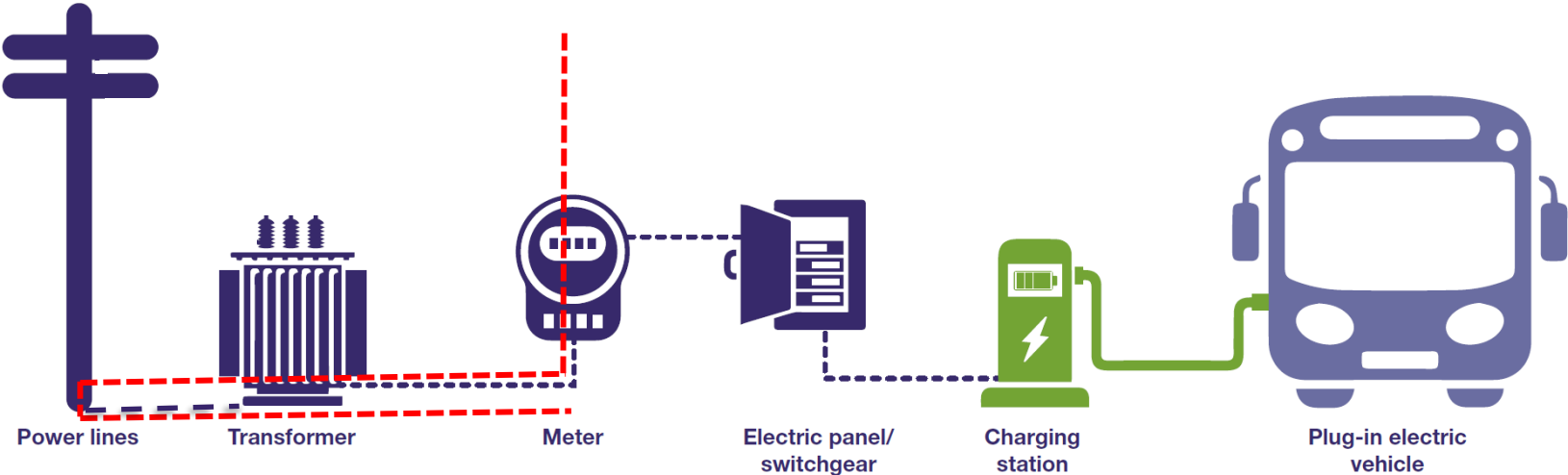


Active Pilots (latest forecast)

Amounts \$000s



Make-Ready infrastructure as it applies to eBus and Commercial pilots



Traditional Utility Infrastructure

Hawaiian Electric Owned Make-Ready Infrastructure

Hawaiian Electric Owned Public Charging

Up to 40 New Sites

- eBus (launched 2022 Q1, extended through 2025)
- Commercial (launched 2022 Q4)



Description & Scope

Hawaiian Electric estimates that the make-ready infrastructure installed in the eBus Pilot will support up to 20 eBus charging ports at 5-10 customer sites

Objectives

- Enable and accelerate the electrification of bus fleets in the Hawaiian Electric Companies’ service territories by **understanding customer behaviors and enable customers to transition faster**
- Develop ways for the Companies to support make-ready infrastructure by learning how to streamline workflows, understand resource needs for charging, and track the costs of infrastructure to develop sound cost estimates for future deployment
- Improve renewable energy integration through bus charging on the eBus tariff

Major Deliverables

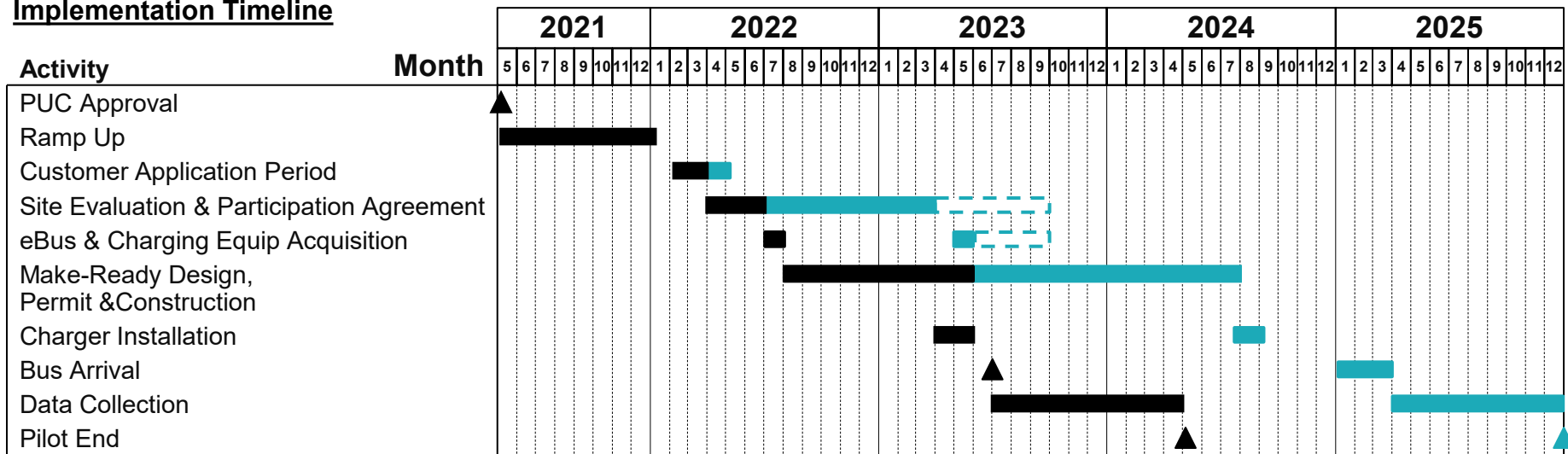
- Implementation Process/Customer Journey
- Final Program Design Report & Appendices
- Annual Updates/Spring Reports
- Infrastructure for up to 20 charging ports at customer sites

Risks

- Funding and customer procurement timelines not aligned with Pilot
- Complex/lengthy landowner approval requirements & processes
- Complex/lengthy permit process
- Supply chain constraints
- Rising labor and material costs



Implementation Timeline



■ Original Implementation Schedule

■ Adjusted Implementation Schedule

Factors contributing to the need for Implementation Schedule adjustments:

- eBus and Charging Equipment RFP delayed by stakeholder concerns.
- Validation of qualified buses and charging equipment impacted by RFP delays.
- Participant modifications to the Participation Agreement and landowner approvals add complexity.
- Longer bus build estimates due to supply chain issues. Currently anticipating 18+ months.
- Risk for longer than expected permit timelines.



Milestone	Target Date	Status
Final Program Design Report	1/7/22	Complete
Pilot launch	2/7/22	Complete
Site Evaluations	5/31/22	Complete
Participation Agreements + Funding Reservation	3/31/23	74%
eBus/Charging Equip. Procurement (customer)	5/31/23	70%
Final Design	10/1/23	
Construction Complete	8/31/24	
Start Data Collection	4/01/25	
Final Report	3/31/26	
Overall % Complete		66%

Updated Forecast (on track)

\$000's	2021	2022	2023	2024	2025	TOTAL
TOTAL	87	183	136	2,019	1,808	4,232

*As of 8/24/23

Observations & Lessons Learned

- Coming out of the pandemic, the number of bus operators ready to procure eBuses in 2022 were fewer than expected.
- State and County entities involved modifications to the standard participation agreement to align with their requirements.
- **State-owned land adds significant complexity and time to seeking approvals for right of entry and grant of easement.**
- **Applicants' procurement timelines continue to be delayed as a result of external factors.**
- Complexity and costs can vary significantly from site to site.
- Bus operators with plans to install more than 2 ports in the near future need to be considered in the make-ready design.
- Uniqueness of each site requires a more hands-on and flexible approach.
- Some facilities may not be eligible for E-Bus rates.
- 10-year data collection commitment can be viewed by some bus operators as a significant resource burden.



Updates

- PUC approved extending pilot through December 31, 2025
- Modifications to the pilot program:
 - Increase charging port limit from 2 to 4 ports
 - Increase rate options to include EV-J and EV-P
 - Reduce data requirements from 10 to 5 years
 - Leverage internal labor in place of outside services where appropriate
- **Submitted an extension request for the E-Bus Tariff, which is set to expire December 2023.**

Next steps

- Receive eBus and charging equipment specifications from applicants
- Execute participation agreements with qualified applicants

Participation KPIs	
Applications Received	3
Site evaluations Completed	3
Applications Withdrawn or Denied	1
Participation Agreements Executed	0
Anticipated Number of eBuses	8
Anticipated Number of Make-ready Charging Ports	6

Schedule KPIs	Site 1	Site 2
Application Received	3/31/22	5/31/22
Days to execute Participation Agreement (as of 8/15/23)	502	441
Days in permitting review		
Days in construction		
Days to install and commission charging equipment (customer)		

Site 1: Hawaii Island – County of Hawaii Mass Transit

Site 2: Maui – Kahului Transit Hub

Other Metrics (when available)

- Actual pilot costs and revenue
- Charger utilization



Description & Scope

Provide make-ready charging infrastructure to eligible fleets, MUDs and commercial sites. Pilot will target up to 30 customer sites (est. 120 charge ports), over a 3-year period, across Hawaiian Electric, Maui Electric, and Hawaii Electric Light. Pilot will reduce upfront costs for customers seeking to install EV charging infrastructure by providing make-ready infrastructure at Hawaiian Electric's expense.

Objectives

- Install infrastructure for Level 2 charger sites
- Collect data to inform future filings
- Test new outreach strategy to speed up & increase application phase
- Define benefits & report impact to underserved communities

Major Deliverables

- Final Program Design Report
- Implementation Plan
- Annual Report
- Infrastructure for Level 2 chargers at customer sites

Risks:

- Complex/lengthy permitting processes (each island is unique) could impact installation timeline
- Rising labor and material costs
- Internal resource constraints



Implementation Timeline

Commercial Charge Up - Estimated implementation timeline based on 20 applicants																																											
	2022												2023												2024												2025						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
PUC Approval	█																																										
Pilot Design				█	█	█	█	█	█	█																																	
Application Period																																											
Funding Reservation																																											
Preconstruction																																											
Design and Build																																											
Charger Installation																																											
Data Collection																																											

- Factors contributing to the need for Implementation Schedule adjustments:
- Validation of qualified charging equipment impacted by customer delays
 - Applicant withdrawals
 - Site complexity and uncertainties



Milestone	Target Date	Status
Final Program Design Report	9/24/22	Complete
Pilot launch	10/25/22	Complete
Contract Management and Design Consultant RFPs Awarded	12/5/22	Complete
Site Evaluations	4/30/23	95%
Participation Agreements Executed	9/1/23	20%
Final Design	9/30/23	
Construction RFP Issued	10/1/23	
Construction Complete	6/1/24	
Start Data Collection	6/1/24	
Final Report	3/31/25	
Overall % Complete		37%

Updated Forecast (on track)

\$000's	2022	2023	2024	2025	TOTAL
TOTAL	159	1,896	2,920	9	4,984

As of 8/24/23



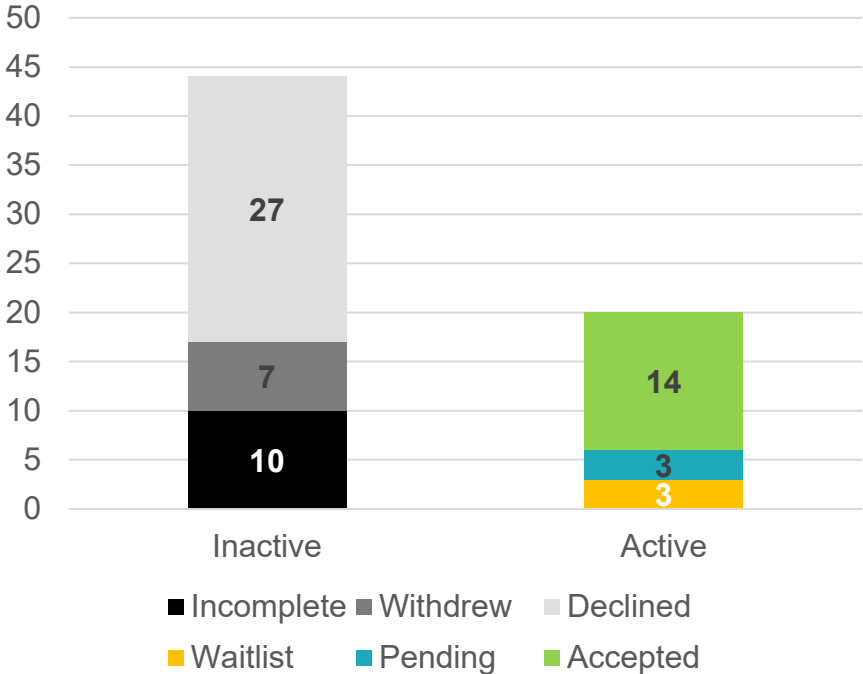
Observations & Lessons Learned

- eBus pilot informed Commercial Make Ready implementation
 - Cost cap
 - Reduce data requirement
- Anticipate 20 sites with 4-6 ports each
- Separately metered service can add complexity
- Customer selection of charging equipment requires more time than anticipated
- 10-year commitment period concerns some applicants

Next steps:

- Receive customers' charging equipment specifications
- Execute Participation Agreements

Applicant Overview



Other Metrics (when available)

- Schedule (approved applicants)
- Actual pilot costs and revenue
- Data Collection
- Charger utilization
- Customer feedback



Description & Scope:

The five-year pilot program (2022-2027) features a time-of-use (TOU) rate structure that incentivizes mid-day charging, when there is abundant solar energy flowing into the grid. Schedule EV-J and Schedule EV-P are approved on a pilot basis, available to a max. 1,000 and 500 customers, respectively. Facilities including businesses, workplaces, and multi-unit dwellings may maintain their current commercial rate (such as Schedule J or Schedule P) or choose a new, separately metered EV rate (Schedule EV-J or EV-P) to benefit from TOU pricing a reduced demand charges. The biggest cost savings under EV-J and EV-P are expected to result from the reduced demand charges, which vary with intensity of use and can often be the largest part of a commercial customer's bill.

Objectives:

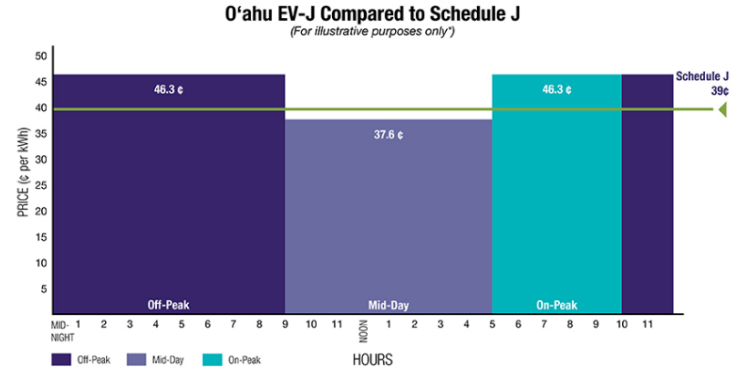
- Measure demand and impact of this type of rate structure on a pilot basis
- Rates are designed to encourage EV charger installation by commercial customers while nudging behavior to charging during mid-day
- Use collected data to inform future filings and/or full-scale deployment

Major Deliverables:

- Annual reports

GREEN status.

No budget.
No deliverables schedule beyond annual reports.



**Illustration reflects September 2022 rates with applicable surcharges.*



Status updates:

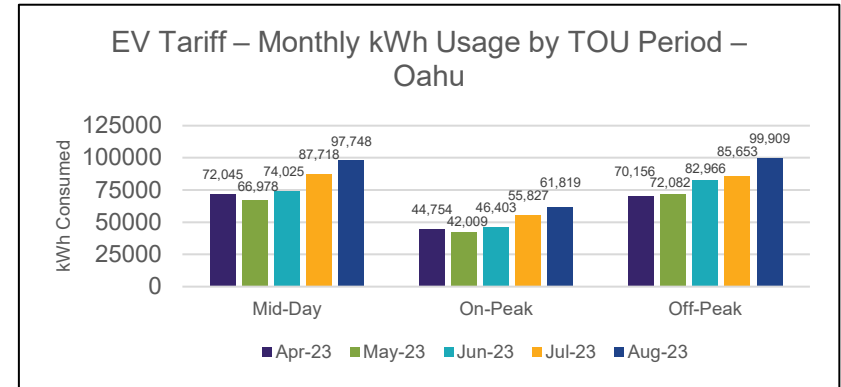
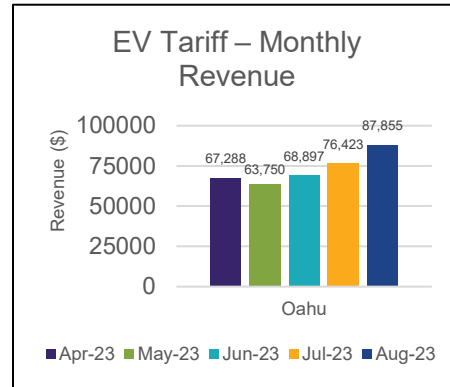
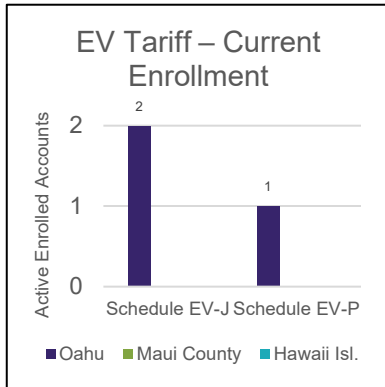
- D&O 38157 issued on 12/30/21, approving pilot
- Tariff sheets were filed 2/1/22
- PUC approved the final tariffs on 3/1/22 to go into effect on 3/18/22
- Filed proposed rates for Molokai & Lanai on 6/30/22 effective 8/1/22
- Current enrollment:
 - Oahu:
 - EV-J: 2 accounts (increased from 0)
 - EV-P: 1 account (no change)
 - Maui County & Hawaii Island:
 - No enrolled accounts

Risks:

- If adoption of EVs/charging stations by commercial customers is slow, we could see low enrollment. No direct financial impact, but dataset to inform future decisions may not be as robust as desired.
- The infrastructure cost of a separately-metered utility service can be a barrier to enrollment in Schedules EV-J and EV-P.

Next steps:

- We are continuing to educate internal stakeholders and customers about the rates, and are reaching out to customers who are requesting new EV charging installations to encourage enrollment
- We are guiding candidate customers through the enrollment process

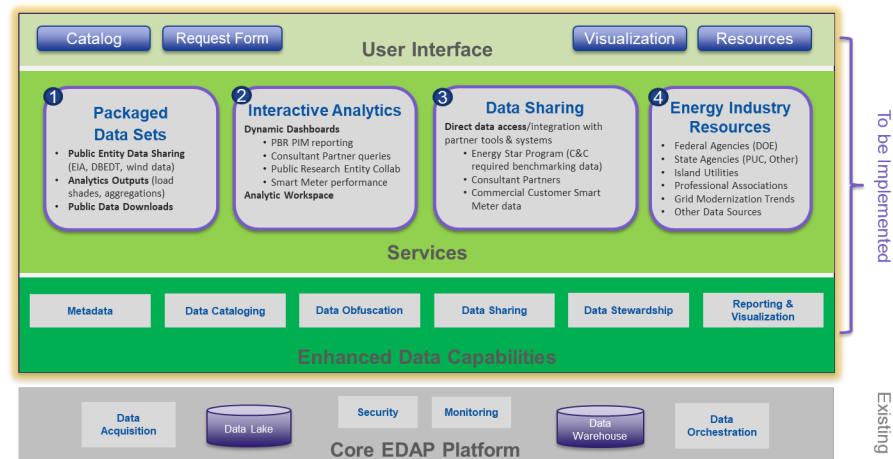


Description & Scope:

- A **cloud-based clearinghouse** of published Hawaiian Electric data and analytical insights
- Built upon **existing Hawaiian Electric investments** in a modern, secure Enterprise Data Analytic Platform (EDAP)
- Usable in a **self-service and collaborative manner** by external stakeholders focusing initially on Pilot Participants (public agencies) through four key services:
 1. Packaged Data Sets
 2. Interactive Analytics
 3. Data Sharing
 4. Energy Industry Resources
- Support **benchmarking, compliance, energy utilization decision-making**, and other data analysis & reporting needs

Objectives:

- Meet regulatory commitments & share data collaboratively
- Measure and demonstrate Clearinghouse solution model & value
- Increase data analytics maturity and useability of data as a strategic asset

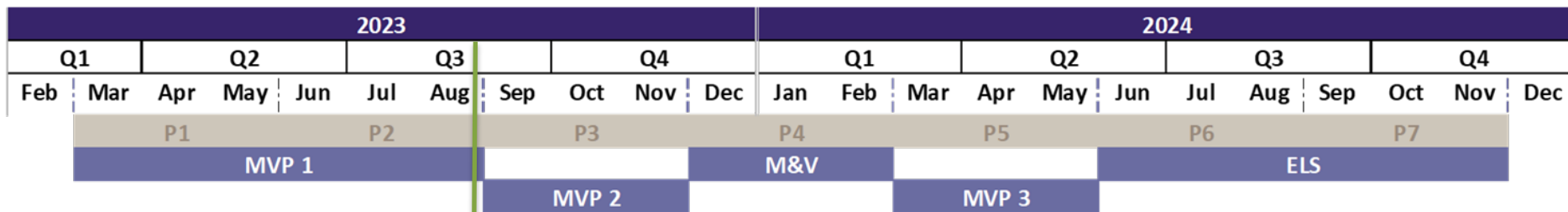


Major Deliverables:

- Deliver on key use cases through execution of three iterative Minimum Viable Product releases
- Enable a secure and effective data architecture to support key Clearinghouse services
- Establish a business operating model for the Clearinghouse

Data Analytics Clearinghouse (DACH) - Timeline

Division	Enterprise Architecture & Planning
Project Manager	Joel Wasson



Status Update (Aug-23): Green

Program Increment 01 completed 05/30

Program Increment 02 initiated 06/07 and on-track to complete, along with MVP-01, on 08/29

- Met with Stakeholders to discuss initial feedback and next steps.
- Kick-off Survey
 - 88% of respondents see the value
 - 81% are aware of the goals
 - 58% identified accessibility to large data as a challenge

Next steps:

- Program Increment 03 & MVP-02 starting and targeted to complete Dec-23
- Initial release and process for data access targeted for Oct-23

Major Deliverables	%	Target
Project START DACH	100%	02/06/23
PI-1	100%	05/30/23
PI-2 & MVP R1; Minimum Viable Product Release 1	100%	08/30/23
PI-3 MVP R2; Minimum Viable Product Release 2	0%	12/04/23
PI-4 & DACH Usability Analysis	0%	03/07/24
PI-5 & MVP R3 Minimum Viable Product Release 3	0%	06/07/24
PI-6 ELS Phase 1 Operational Support	0%	09/04/24
PI-7 ELS Phase 2 Operational Support (TBD)	0%	12/02/24

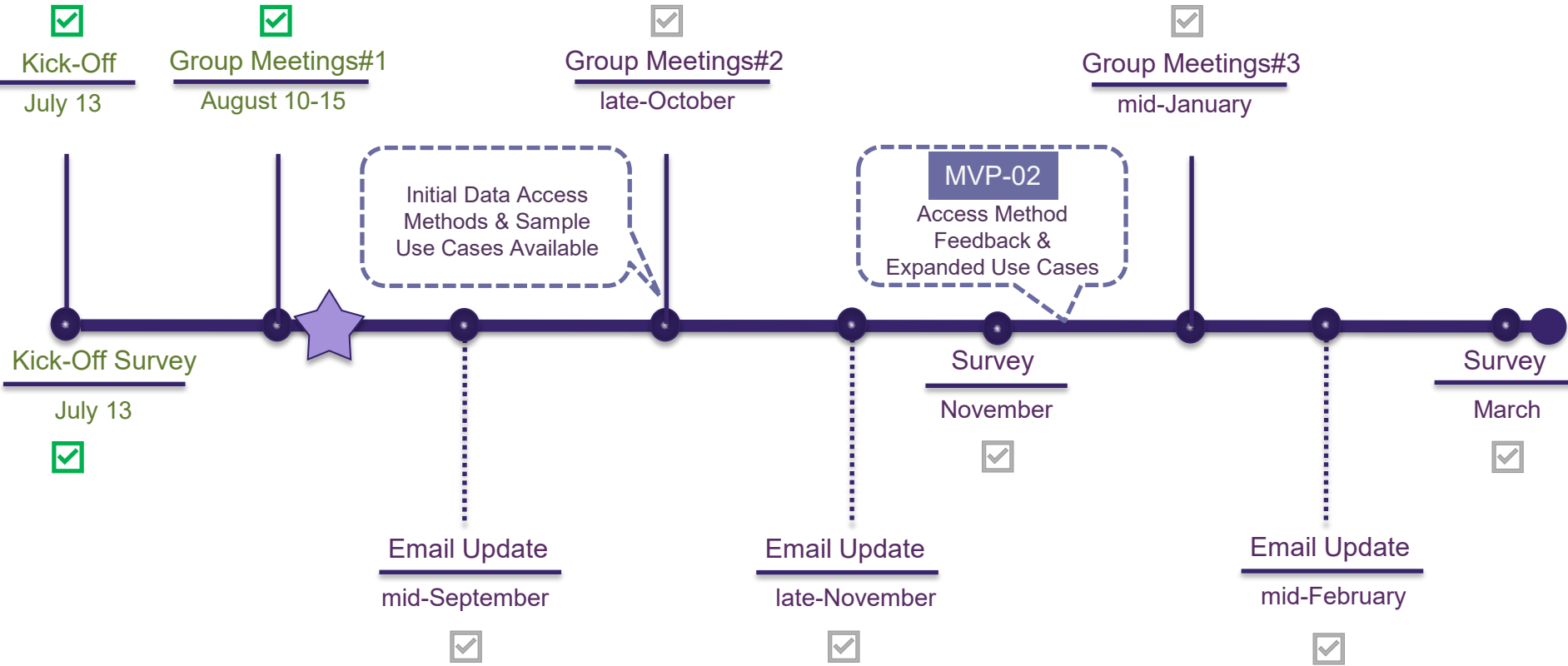
Updated Forecast & Budget (on track, but evaluating for PI-03)

\$000's	2023 Total	2024 Total	2025 Total	Grand Total
Updated Forecast	1,745	812	126	2,683
Budget	1,830	928	0	2,758
Variance	(85)	(117)	126	(76)



DACH Communication Plan Based on Preferences

67% preferred group meetings - 58% preferred updates via email





1. Drivers are already opted into data share arrangement via original equipment manufacturer's ("OEM") terms and conditions



2. OEMs enabled to share EV telematics data with third parties

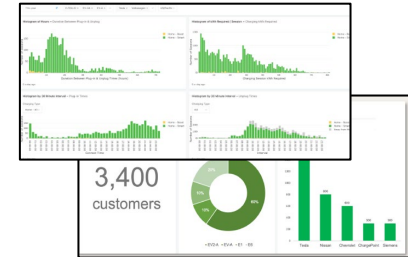


4. Vendor/partner

provides customer app where drivers can view charging and Pilot details



3. Vendor/partner collects telematics by 'scraping' from OEM APIs and through direct relationships



5. Hawaiian Electric

accesses dashboards and telematics data hosted on vendor's cloud-based portal



Description & Scope

The EV Telematics pilot (i.e., “Smart Charge Hawaii”) uses emerging technology (i.e., real-time onboard EV telematics) to collect data on EV charging metrics and provide information on EV driving habits. The Pilot includes a customer-facing interface (i.e., a free app available for download on Google and Apple stores) as well as a utility-focused application (i.e., web-based dashboards displaying real-time customer charging data) developed by a third-party technology vendor (ev.energy). Participants receive a financial incentive for signing up and participating in the Pilot.

Objectives

The purpose of the pilot is to enroll up to 2,000 EV driving participants across our service area, collect telematics data, gain visibility into EV charging behavior data, and then share the data with internal and external stakeholders.

Major Deliverables

- Participant charging behavior dashboards and raw data (cloud-based portal)
- Feedback from stakeholders on usefulness of data
- Feedback from participants in the form of surveys/focus group interviews
- Quarterly PUC and stakeholder pilot updates (e.g., participant tracking, heat maps, EV charging trends etc.)
- Annual pilot update report

Risks

- OEMs could limit access to telematics data for ev.energy
- Ev.energy could be acquired or go out of business
- Lack of participant sign-ups

Updated Forecast (on track)

\$000's	2023	2024	2025	TOTAL
TOTAL	\$349	\$473	\$0	\$822

As of 8/24/23



Implementation Timeline

Milestone	Timing*	Status
Public facing webpage design signed off by Hawaiian Electric	5/23/2023	Complete
Public facing webpage live	5/24/2023	Complete
Smart Charge Hawaii customer support live	5/24/2023	Complete
FAQs and customer support responses signed off by Hawaiian Electric	5/24/2023	Complete
Press release published	5/24/2023	Complete
Monitor participant sign-ups	June - September 2023	Ongoing
Outreach emails sent to selected customers for enrollment	June/July 2023	Complete
Web-based data dashboard built to collect and report pilot enrollment and charging data; walk-through with EoT team	July 2023	Complete
Send out \$75 enrollment incentives (or 5,000 HawaiianMiles)	December 2023	Pending
Focus group with up to 10 participants / Survey all participants	January/February 2024	Pending
Pilot close – data collection ends	December 2024	Pending
Send out the \$75 completion incentives (or 5,000 HawaiianMiles)	December 2024	Pending
Post-pilot focus group with up to 10 participants / Survey all participants	December 2024 or January 2025	Pending
Wrap up, analysis and future planning	December 2024	Pending

Next Steps

- Continue paid search marketing activities with ev.energy
- Boost outreach with partners (Drive Electric Hawaii, Blue Planet, Hawaii Energy)
- ev.energy / Hawaii EV Association promoting Smart Charge Hawaii at National Drive Electric Week
- Distributing sign-up materials at 2023 Hawaii Auto Dealer Association Convention



*Dates may be subject to change

Participation KPI	
Total customers enrolled on app to date (2,000 target)	184
Oahu	80%
Hawaii Island	10%
Maui	10%

Note: ~640 customers have signed up as of 8/28/2023.

What's next?

- ◆ Next quarterly IPF stakeholder meeting is Wed., Dec. 6 (1:00-2:30pm)
- ◆ Save the dates in 2024:
 - Wed., Mar. 20, 2024 (1:00-2:30pm)
 - Wed., June 12, 2024 (1:00-2:30pm)
 - Wed., Sept. 18, 2024 (1:00-2:30pm)
 - Wed., Dec. 4, 2024 (1:00-2:30pm)





THANK YOU