FOR DISCUSSION PURPOSES ONLY

Hawaiian Electric

Innovation Pilot Framework (IPF) Portfolio Update

June 12, 2024

Agenda

June 12, 2024 (1:00 - 2:30 PM HST)

- In-flight pilot updates
- Status of pilot concepts in pipeline

In-Flight Pilot Updates

Key Takeaways

Status:

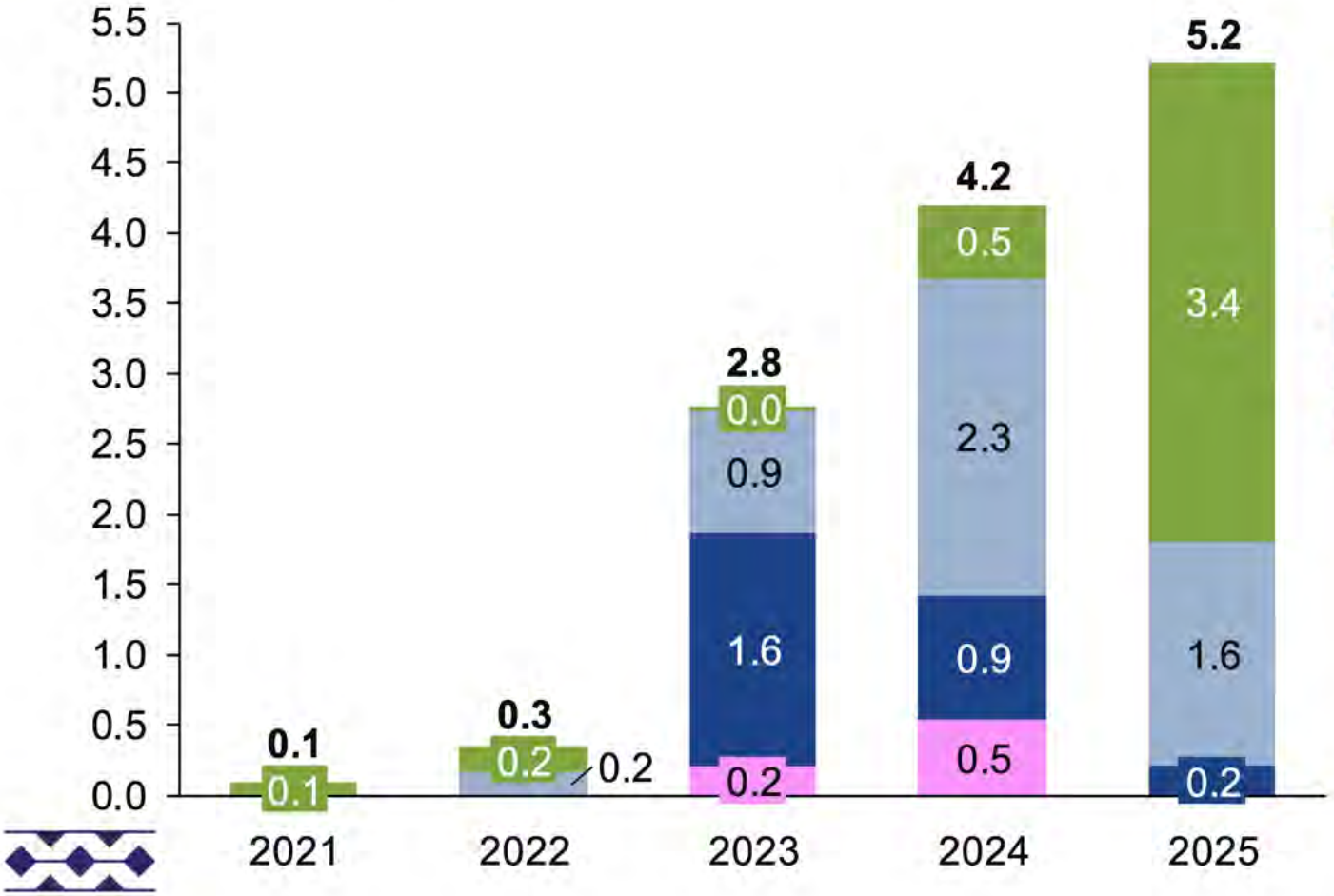
- IPF Annual Pilot Update Report filed on 3/11/24

Active pilots:

- **Charge Up eBus** – Yellow: Executed 1 Participation Agreement. 1 agreement pending approval. 1 application pending.
- **Charge Up Commercial** – Yellow: Executed 13 Participation Agreements. 12 Designs. Completed site visits of all potentially feasible applicant sites.
- **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 05 completed 5/31/24; Program Increment 06 started 6/3/24.
- **EV Telematics (Smart Charge Hawaii)** – Green: Continued focus on enrollment through localized outreach efforts. Large data set being processes for upload into DACh. Continuing the surveying of EV drivers and other stakeholders for feedback.

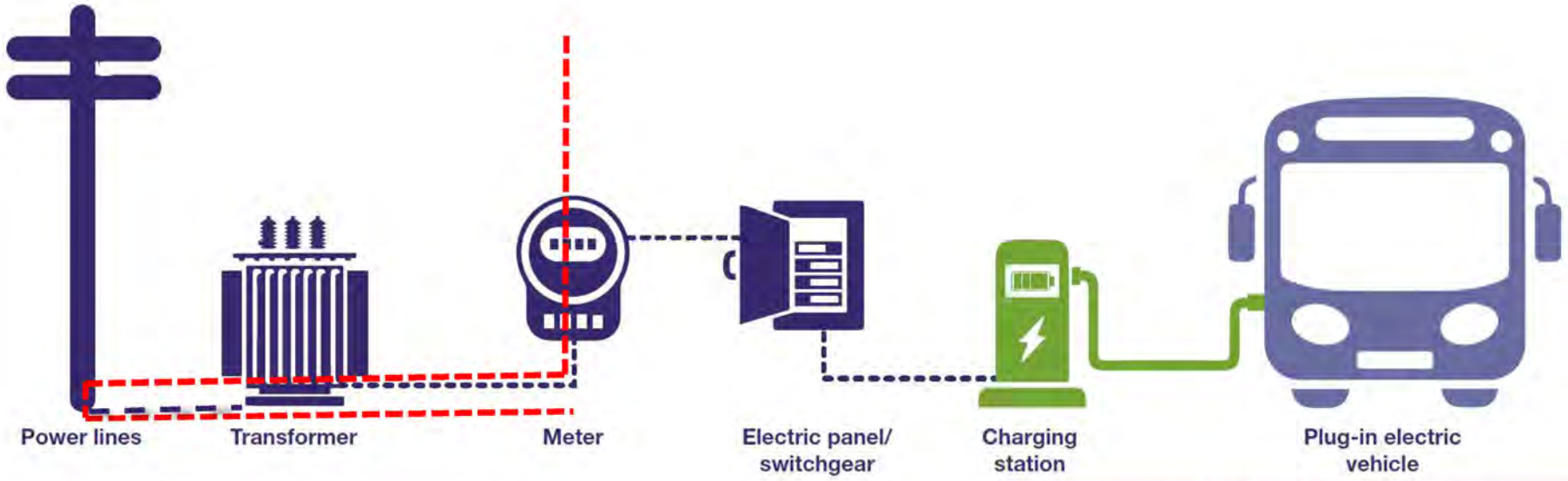
Active Pilots (latest forecast)

$millions



Totals may not foot due to rounding

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

Charge Up eBus

Division	EoT
Project Manager	Tandy Tabata

Description & Scope

Hawaiian Electric estimates that the make-ready infrastructure installed in 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

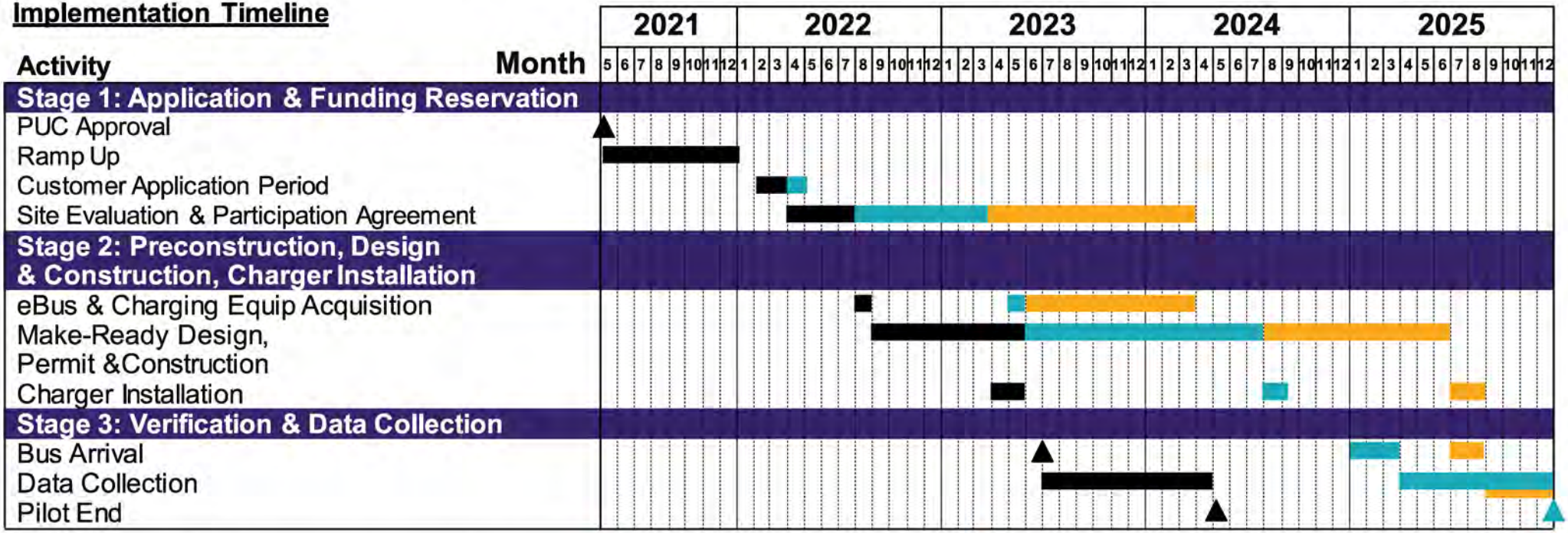
Risks

- 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

Charge Up eBus

Division	EoT
Project Manager	Tandy Tabata

Implementation Timeline



Factors contributing 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.
- Longer bus build estimates due to supply chain issues. Currently anticipating 18+ months.
- Risk for longer than expected permit timelines.

Charge Up eBus

Division	EoT
Project Manager	Tandy Tabata

Milestone	Target Date	Status
Final Program Design Report	1/7/22	Complete
Pilot launch	2/7/22	Complete
Site Evaluations	5/31/22	81%
Participation Agreements + Funding Reservation	12/30/23	62%
eBus/Charging Equip. (customer)	12/30/23	67%
Make-Ready Final Design	6/30/24	38%
Make-Ready Construction	6/30/25	
Charging Equipment Installation (customer)	8/31/25	
Data Collection	9/01/25	
Final Report	3/31/26	
Overall % Complete		**45%**

Updated Forecast (on track)

U2405

$000s	2021	2022	2023	2024	2025	TOTAL
TOTAL	**87**	**183**	**29**	**523**	**3,410**	**4,232**

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 requested modifications to the standard participation agreement to align with their requirements, thus extending the time to execute.**
- State-owned land adds significant complexity and time to seeking approvals for right of entry and grant of easement.
- **Applicants' procurement timelines 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.

Charge Up eBus

Division	EoT
Project Manager	Tandy Tabata

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
- Received PUC approval and filed revised tariff sheets to extend the E-Bus-J and E-Bus-P through December 2024. Pending approval to allow make-ready applicants to remain on original E-Bus Pilot rates for the 10-year commitment.

Next steps

- Site 1: Execute participation agreement
- Site 2: Finalize site design
- Site 3: Complete site assessment

Participation KPIs	
Applications Received	5
Site evaluations Completed	3
Applications Withdrawn or Denied	2
Participation Agreements Executed	1
Anticipated Number of eBuses	9
Anticipated Number of Make-ready Charging Ports	10

Schedule KPIs (as of 5/31/24)	Site 1	Site 2	Site 3
Application Received	3/31/22	3/31/22	3/6/24
Days to execute Participation Agreement	712	613 Executed	86
Days in permitting review		32	
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
Site 3: Oahu – Ka Waihona o Ka Na`auao Public Charter School

Other Metrics (when available)

- Actual pilot costs and revenue
- Charger utilization

Charge Up Commercial

Division	EoT
Project Manager	Kevin Hachey

Description & Scope

Provide make-ready charging infrastructure to eligible fleets, MUDs and commercial sites. Pilot will target up to 20 customer sites (est. 80 charge ports), across Hawaiian Electric, Maui Electric, and Hawaii Electric Light. Pilot will reduce upfront costs for commercial 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
- Develop actual pilot costs and lessons learned to inform future filings
- Increase enrollment in commercial EV rates
- Collect data to inform future filings

Major Deliverables

- Final Program Design Report
- Implementation Plan
- Annual Report
- Make Ready Infrastructure for Level 2 chargers at up to 20 sites

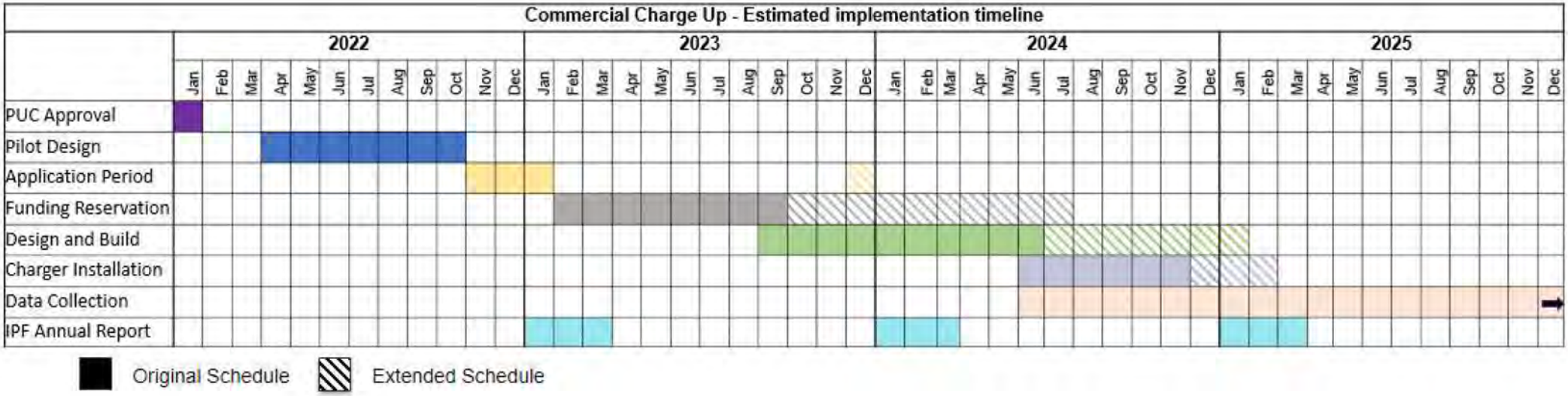
Risks:

- 6 designs rejected by Company planners due to meter placement not meeting Company engineering standards (Switchboards: unmetered sections cannot be tapped)
- Complex/lengthy permitting processes (each island is unique) could impact installation timeline
- Rising labor and material costs
- Applicant withdrawals/limited feasible sites
- Complex/lengthy landowner approval requirements & processes

Charge Up Commercial

Division	EoT
Project Manager	Kevin Hachey

Implementation Timeline



Factors contributing to the need for Implementation Schedule adjustments:

- Applicant review/approval of required documents
- Validation of qualified charging equipment impacted by customer delays
- Applicant withdrawals
- Site complexity and uncertainties

Charge Up Commercial

Division	EoT
Project Manager	Kevin Hachey

Milestone	Target Date	Status
Final Program Design Report	9/24/22	Complete
Pilot launch	10/25/22	Complete
PUC Response	11/25/22	Complete
Contract Management and Design Consultant RFPs Awarded	12/5/22	Complete
Site Evaluations	5/1/24	96%
Participation Agreements Executed	8/1/24	65%
Final Design	10/1/24	55%
Make-Ready Construction Complete	5/1/25	
Charger Installation Complete	6/1/25	
Data Collection	7/1/25	
Final Report	3/31/26	
Overall		**45%**

Updated Forecast (on track)

$000s	2022	2023	2024	2025	TOTAL
TOTAL	**159**	**878**	**2,176**	**1,674**	**4,888**

Observations & Lessons Learned

- eBus pilot informed Commercial Make Ready implementation
  - Cost cap
  - Reduce data requirement
- Anticipate up to 18-20 sites with 4-6 ports each based on cost estimates
  - Outside services – site evaluation and design
- Separately metered service can add complexity
- Duration from Pilot acceptance to executed agreement was longer than anticipated
- Customer withdrawals due to
  - 10-year commitment period and uncertainty in customer plans for the site
  - Incremental costs above the cap

Charge Up Commercial

Updates

- PUC approved extending pilot through December 31, 2025
- Modifications to the pilot program:
  - Leverage internal labor in place of outside services where appropriate
  - PUC approved waving separately metered service and EV rate enrollment requirements for primary metered customers
- Plan to file PUC letter requesting exemption from separately metered service and EV rate enrollment for sites with rejected designs. Install sub-meter for data collection
  - Use spare meter socket where available

Next steps:

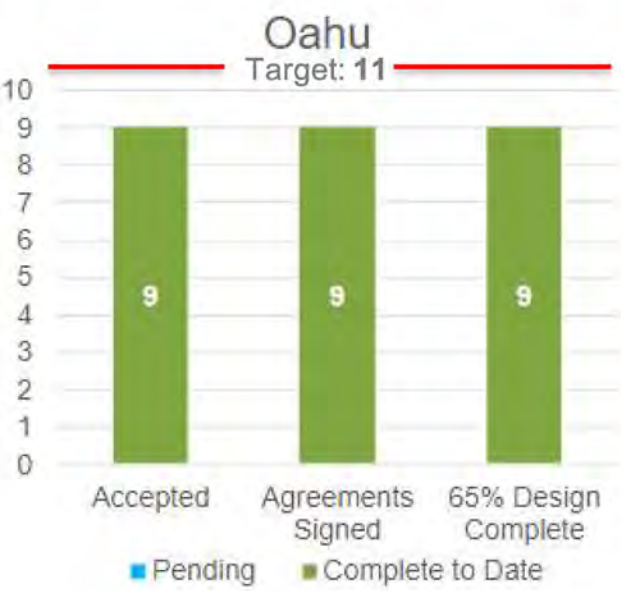
- Execute participation agreements with qualified applicants
- Finalize site designs
- Schedule construction upon permit approval

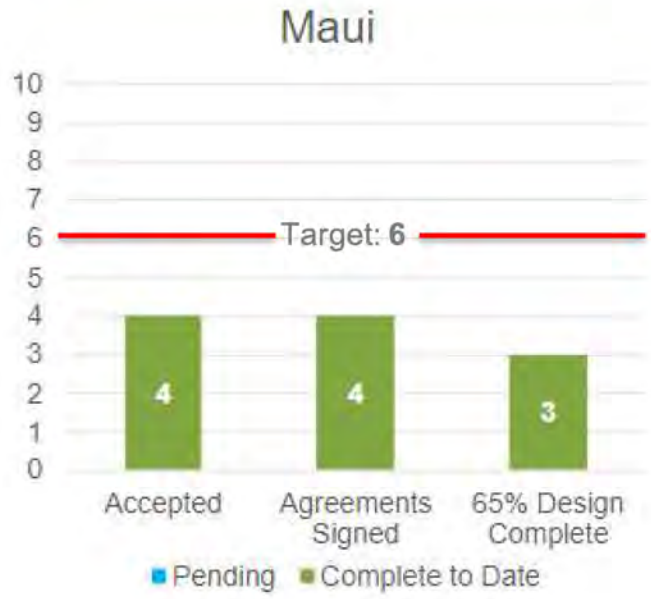
Applications	#
Applications Received	80
Applications Complete	69
Oahu	39
Hawaii Island	10
Maui	20
Site Evaluations/Visits Completed	66
Applications Accepted	23
Applications Denied	33
Applications Withdrawn	16
Applications Pending	7
Participation Agreements Executed	13

Charge Up Commercial

Division	EoT
Project Manager	Kevin Hachey

2024 Target: 20 agreements





*Pending items are awaiting customer signature/approval

EV-J and EV-P Tariff Pilot

Division	EoT
Project Manager	Ethan Landy

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.

GREEN status.

No budget.
No deliverables schedule beyond annual reports.

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

O'ahu EV-J Compared to Schedule J

(For illustrative purposes only)*

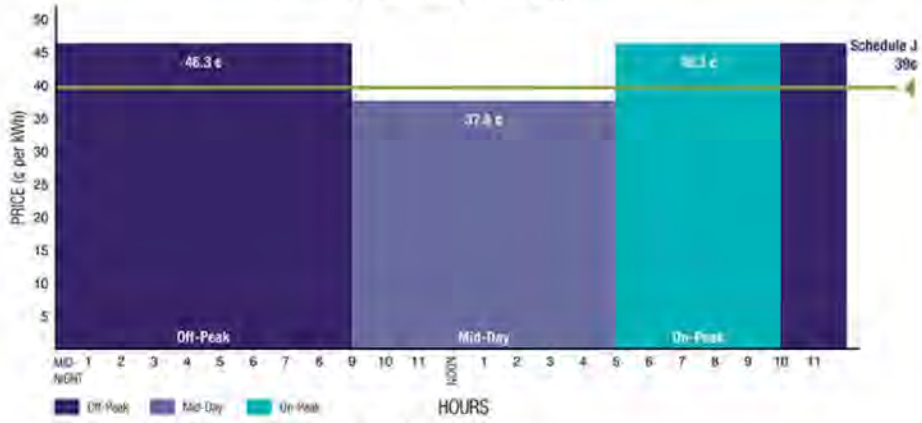
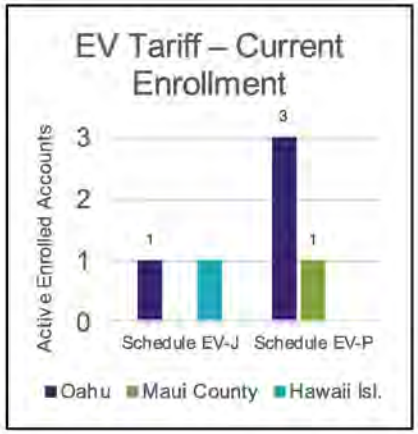
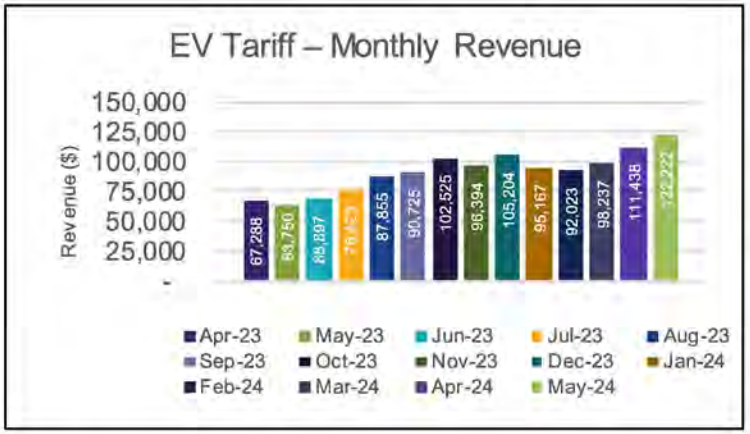


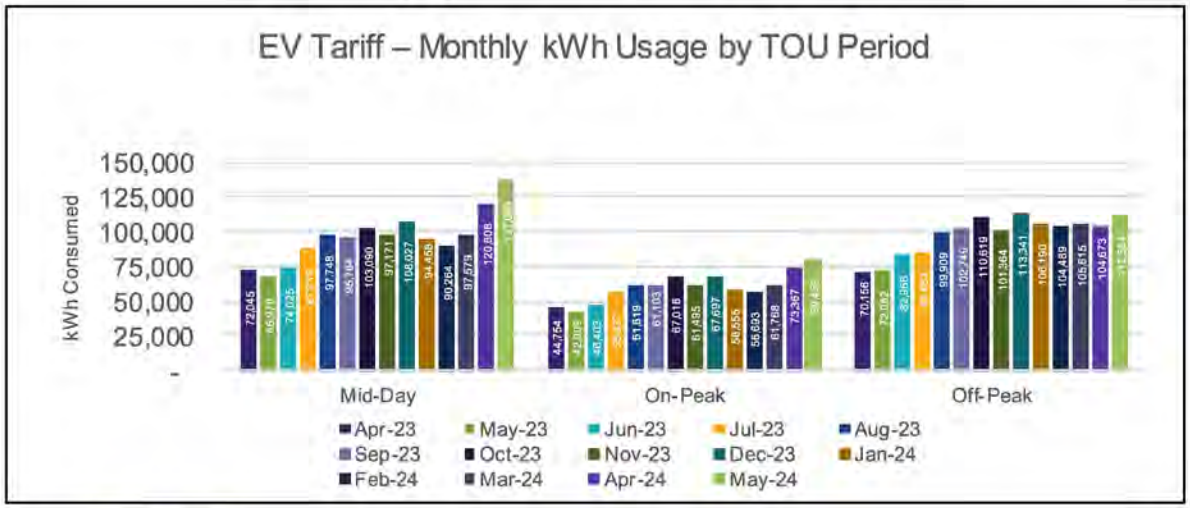
*Illustration reflects September 2022 rates with applicable surcharges.

EV-J and EV-P Tariff Pilot

Division	EoT
Project Manager	Ethan Landy







Key Risks & Takeaways:

- Sustained interest from eligible customers.
- Enrollment rate is limited by rate of EV charging infrastructure development. No direct financial impact, but dataset to inform future decisions may not be as robust as desired.
- We are continuing to evaluate ways to increase enrollment.
- Despite customer interest, the infrastructure cost for a separately-metered service remains a barrier to enrollment for some.
- There is an opportunity to increase enrollment by using revenue-grade submetering to disaggregate EV charging loads from other loads.

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: 1 account
    - EV-P: 3 accounts
  - Maui County:
    - EV-P: 1 account
  - Hawaii Island:
    - EV-J: 1 account (one new enrollment)
- Continuing to explore ways to facilitate enrollment process

Data Analytics Clearinghouse (DACh) - Overview

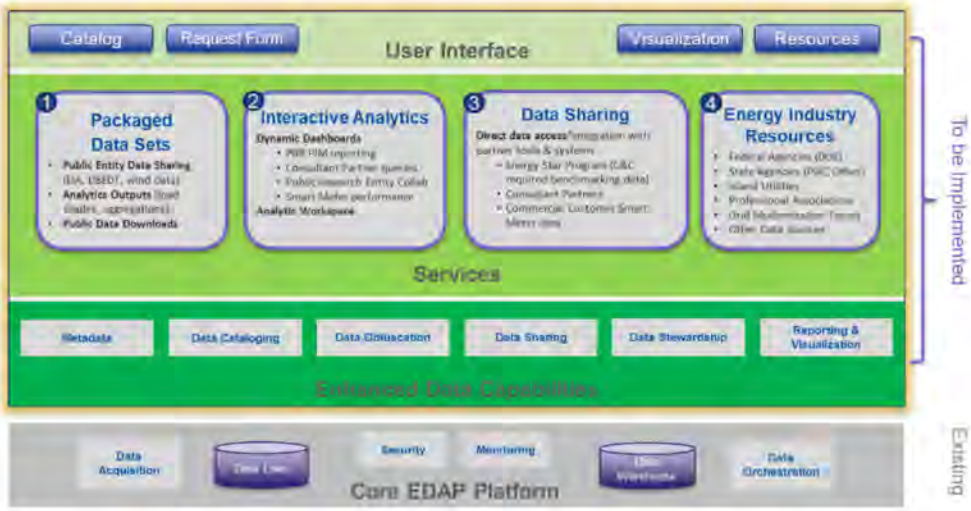
Division	Enterprise Architecture & Planning
Project Manager	Joel Wasson

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

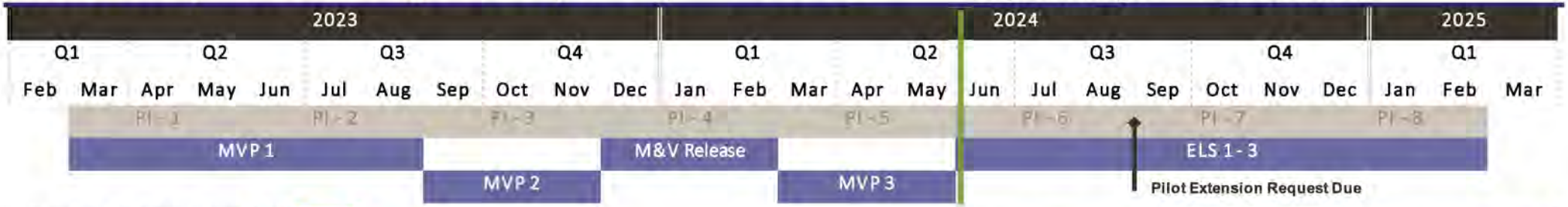


Major Deliverables:

- 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 (Jun-24): Green

Program Increment 05 completed 5/31/24

Program Increment 06 started 6/3/24

- Usage metrics tracked through Power BI
- Bi-weekly Collaboration Office Half-Hour conducted on Thursdays
- Addressed several new requests: additional data provided by UH loaded with shared access; enabled R & R spark functionality
- Developed & presented Getting Started with Databricks on Anonymized AMI Data V1.0.0 Guideline
- Hawaii Energy unable to access Clearinghouse

Next steps:

- Use Case Site Type Load Patterns Benchmarking
- Evaluate changes to new views ("Effective Rates Table" and "Property Value Bins for Residential Accounts") & incorporation of MV90 data
- Conduct review session with extended participants and identify approach for clearinghouse usage in 2025

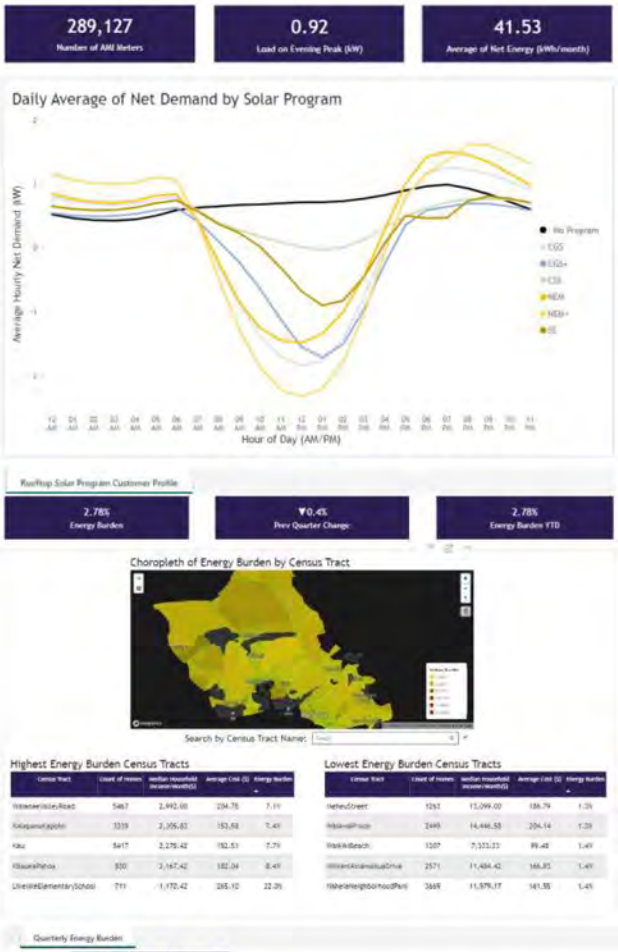
* August 30, 2024: deadline for request to extend and/or expand the Pilot

Major Deliverables	%	Start	Target
Project Initialization	**100%**	**2/6/23**	**2/27/23**
PI-1	**100%**	**2/27/23**	**5/30/23**
PI-2 & MVP R1	**100%**	**5/31/23**	**8/29/23**
PI-3 & MVP R2	**100%**	**8/30/23**	**12/3/23**
PI-4 M&V Release	**100%**	**12/4/23**	**3/1/24**
PI-5 & MVP R3	**100%**	**3/4/24**	**5/31/24**
PI-6 ELS - 1	**5%**	**6/3/24**	**8/30/24**
PI-7 ELS - 2 (TBD)	**0%**	**9/2/24**	**11/29/24**
PI-8 ELS - 3 (TBD)	**0%**	**12/2/24**	**2/28/25**

Budget Forecast (on track) – Total budget $2,758

$000s	2023	2024	2025	Total
Updated Forecast	1,645	877	209	2,731

Portal & Use Cases



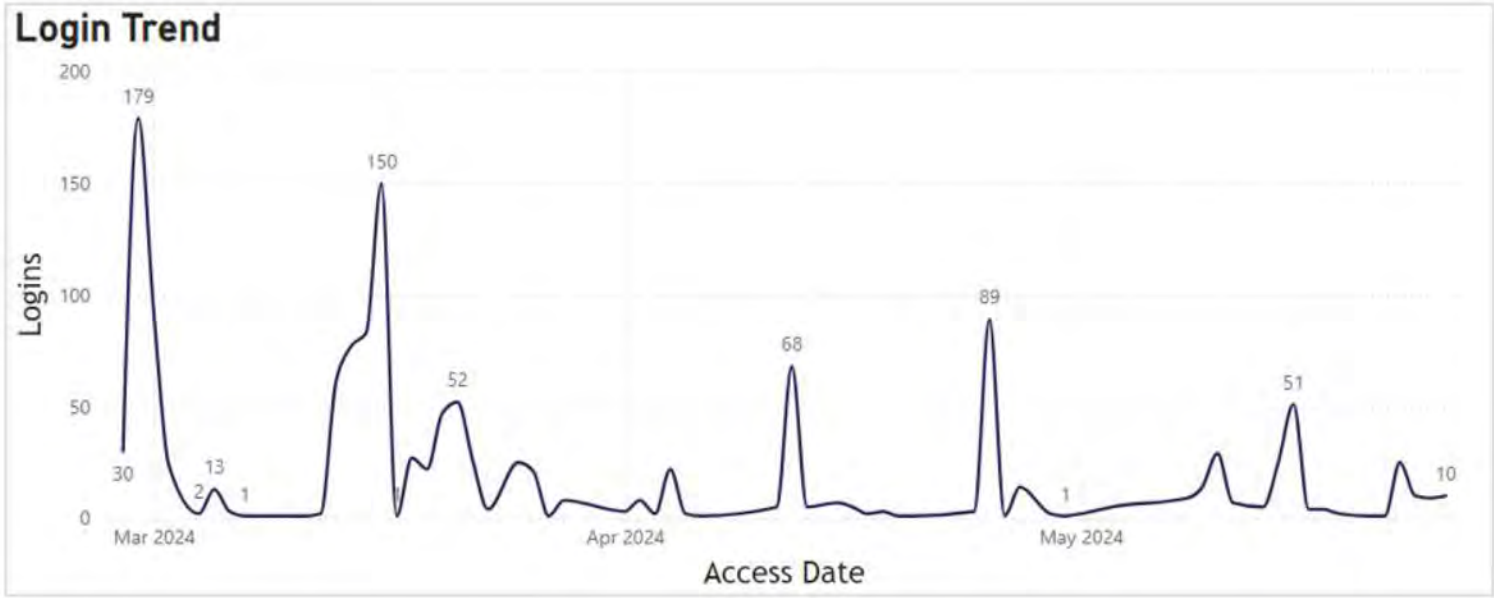
Portal: https://clearinghouse.hawaiianelectric.com/

Collab and DACh Portal Usage (External Entities) - Year 2024 to date

#Logins
1360

#Logins by Access Method

Collab Workspace	DACh Portal
952	408



Residential EV Telematics Pilot

Division	EoT
Project Manager	Timur Tufail

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

4. Vendor/partner provides customer app where drivers can view charging and Pilot details

ev.energy

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

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

Residential EV Telematics Pilot

Division	EoT
Project Manager	Timur Tufail

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)

$000s	2023	2024	TOTAL
TOTAL	**$177**	**$533**	**$710**

Residential EV Telematics Pilot

Division	EoT
Project Manager	Timur Tufail

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 - November 2024	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)	October/November 2023	Complete
Focus group with up to 10 participants / Survey all participants	April - July 2024	In progress
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

*Dates may be subject to change

Residential EV Telematics Pilot

Division	EoT
Project Manager	Timur Tufail

Enrollment Details

(As of 6/4/2024)

Unique Drivers Connected

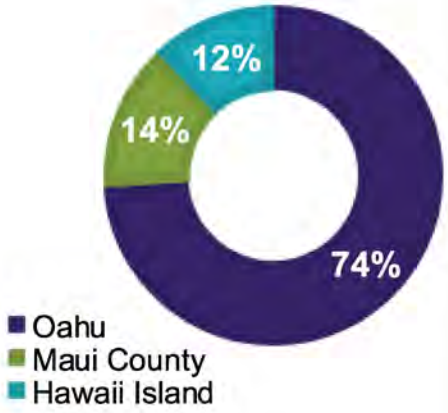
709

Devices Connected*

763

* Includes Multiple EVs in household and Smart Chargers

Service Area Distribution



Pilot Updates

- **Positive experience at Smart Charge Hawaii Road Show**
  - Earth Month Event at Kahala Mall (4/27)
  - Over 200 attendees

- **Active media opportunities being pursued:**
  - HI Now Daily, Spectrum News, Hawaii Public Radio, KHON2
- **Developing local EV driver testimonial videos to be promoted on social media.**
- **EV Telematics data in review process ahead of Data Analytics Clearinghouse upload.**
- **Preliminary insights and driver feedback results analyzed (see next slide).**

Residential EV Telematics Pilot

Division	EoT
Project Manager	Timur Tufail

Pilot Insights

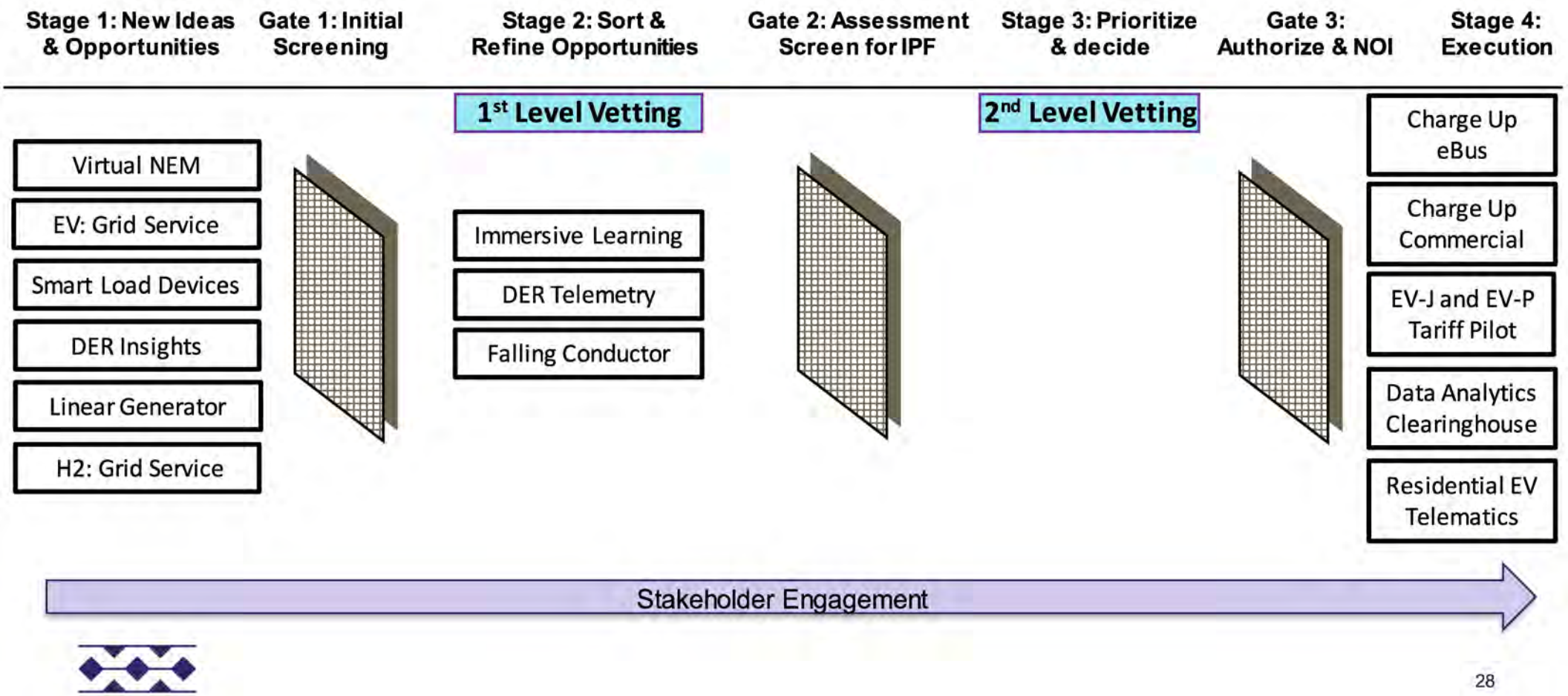
- **Over 42,000 individual charging sessions have been recorded**
- **Over 700,000 kWh of energy dispensed**
- **Top 3 OEMs:**
  - Tesla
  - Nissan
  - BMW
- **Charging Behavior**
  - Majority of charging happens during daylight hours (i.e., 09:00 to 17:00)
  - Approximately 70% of participants have Level 2 chargers at home.
- **State of Charge**
  - Majority of drivers start charging at 60% state of charge.
  - Ending state of charge is typically 90%.

Key Survey Findings

- **Awareness**: Majority of respondents learned about the pilot via email (47%) with Facebook in second place (18%).
- **Incentives**: 82% of respondents felt the pilot incentive amount was reasonable.
- **Primary Residence**: 84% of respondents live in single-family homes (75% of this population have solar panels).

Pilot Pipeline

Innovation Pilot Framework (IPF) pipeline status board



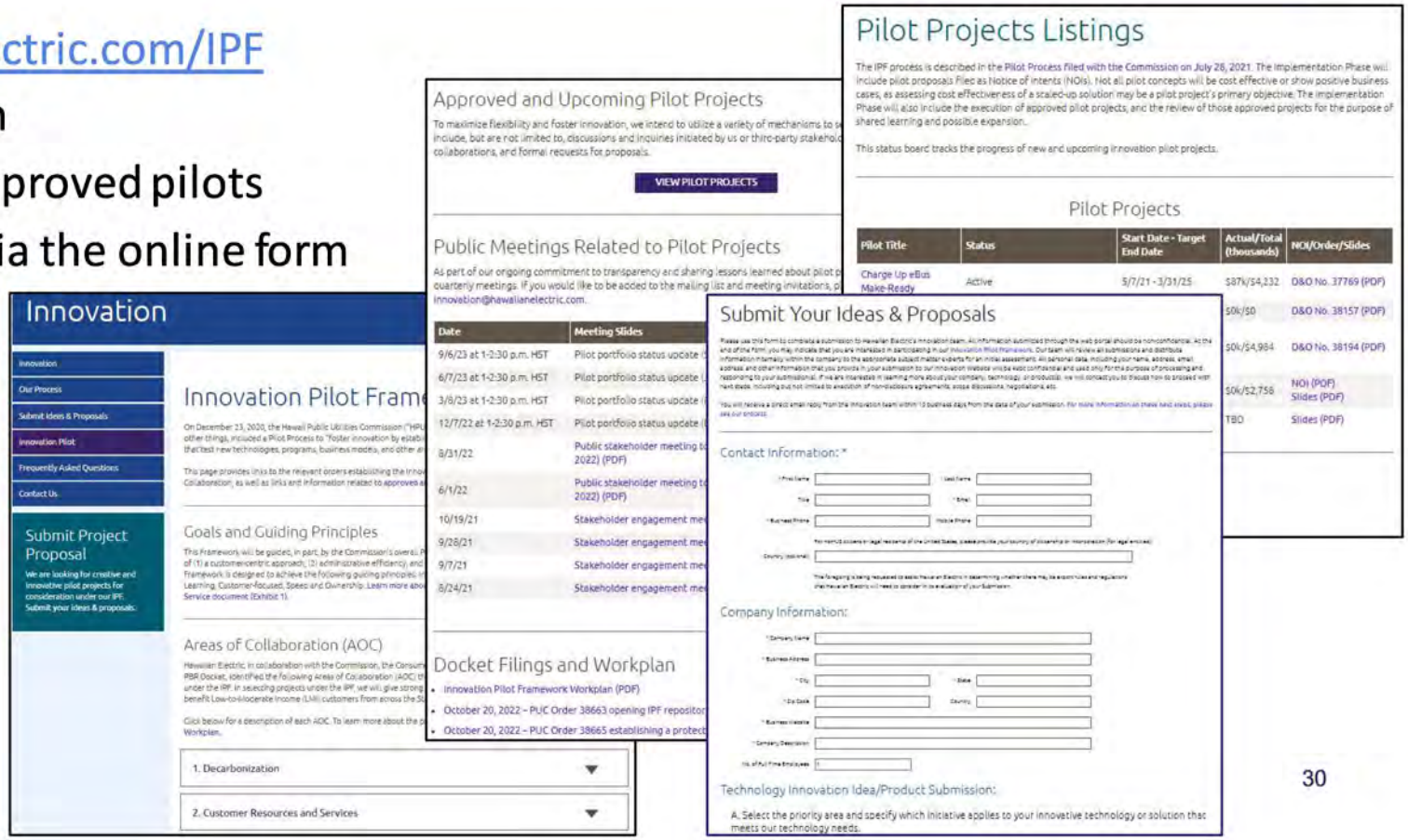
What's next?

- Next quarterly IPF stakeholder meeting: Sept. 18 (1:00-2:30pm)
- Remaining 2024 Meetings
  - Dec. 4 (1:00-2:30pm)

Innovation Pilot Framework Website

Website: hawaiianelectric.com/IPF

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



THANK YOU