FOR DISCUSSION PURPOSES ONLY

Hawaiian Electric

Innovation Pilot Framework (IPF) Portfolio Update

March 20, 2024

Agenda

March 20, 2024 (1:00 - 2:30 PM HST)

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

In-Flight Pilot Updates

Key Takeaways

Status:

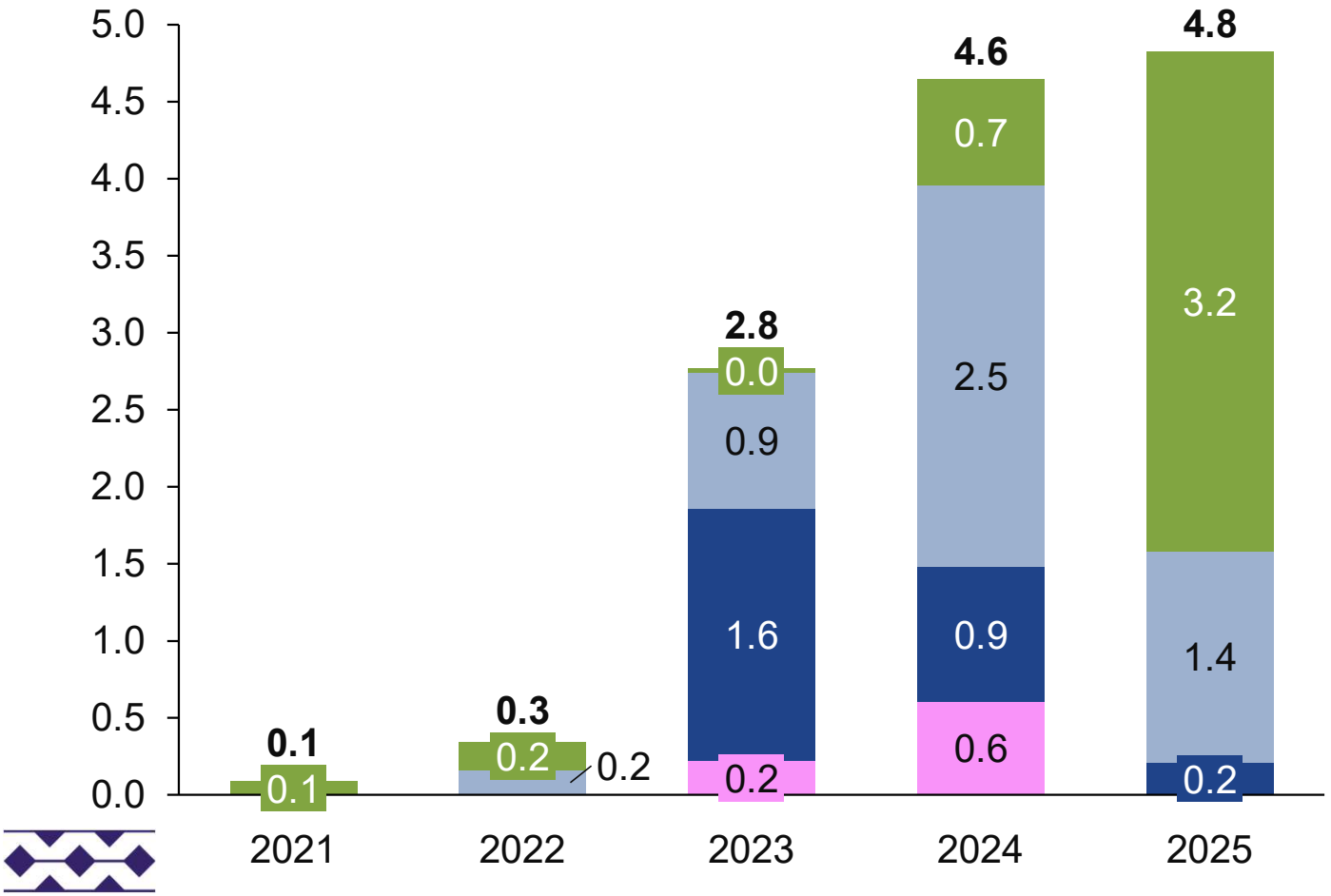
- IPF Annual Report filed on 3/11/24

Active pilots:

- **Charge Up eBus** – Yellow: One (1) Participation Agreement is pending review. Due to delays in procurement and long bus-build timelines, buses are expected to arrive mid-late 2025.
- **Charge Up Commercial** – Yellow: Extended Pilot to Dec. 2025. Accepted 13 sites, executed 12 Participation Agreements.
- **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 04 completed 3/1/24. Program Increment 05 started 3/4/24. Program Participants received guest accounts and access to Portal and Collaboration Workspace. Measurement & Verification phase initiating and expected to run through Q1 2024.
- **EV Telematics (Smart Charge Hawaii)** – Green: Continued focus on enrollment through localized outreach efforts. Large data set viable candidate for DACh. Commencing the surveying of EV drivers and other stakeholders for feedback.

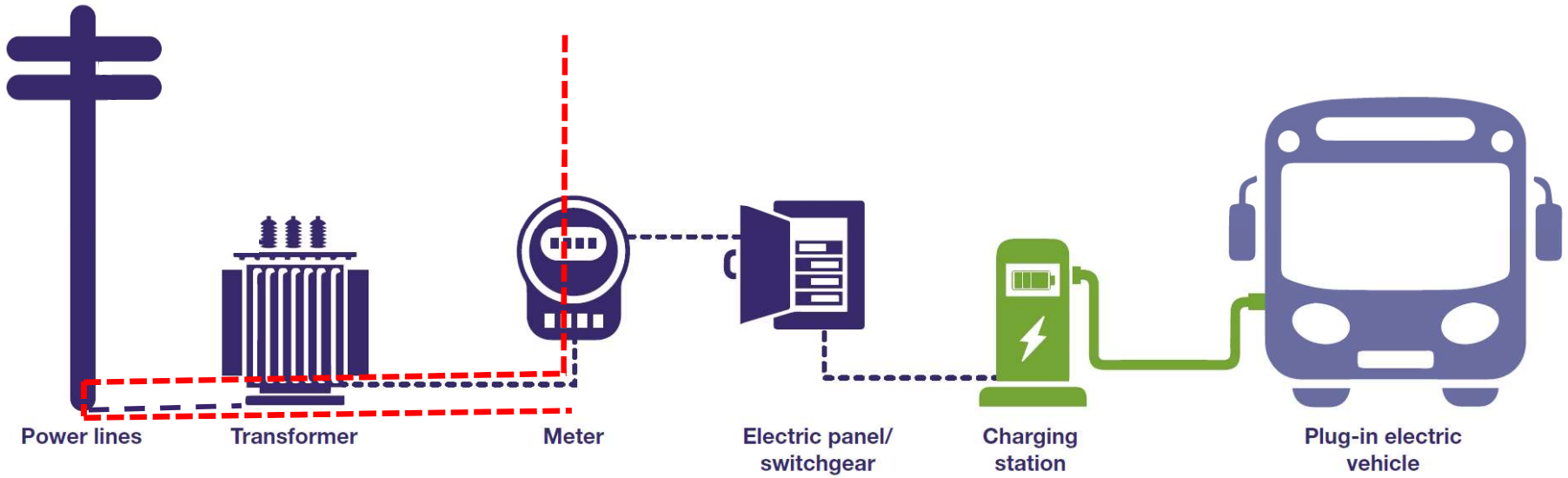
Active Pilots (latest forecast)

$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

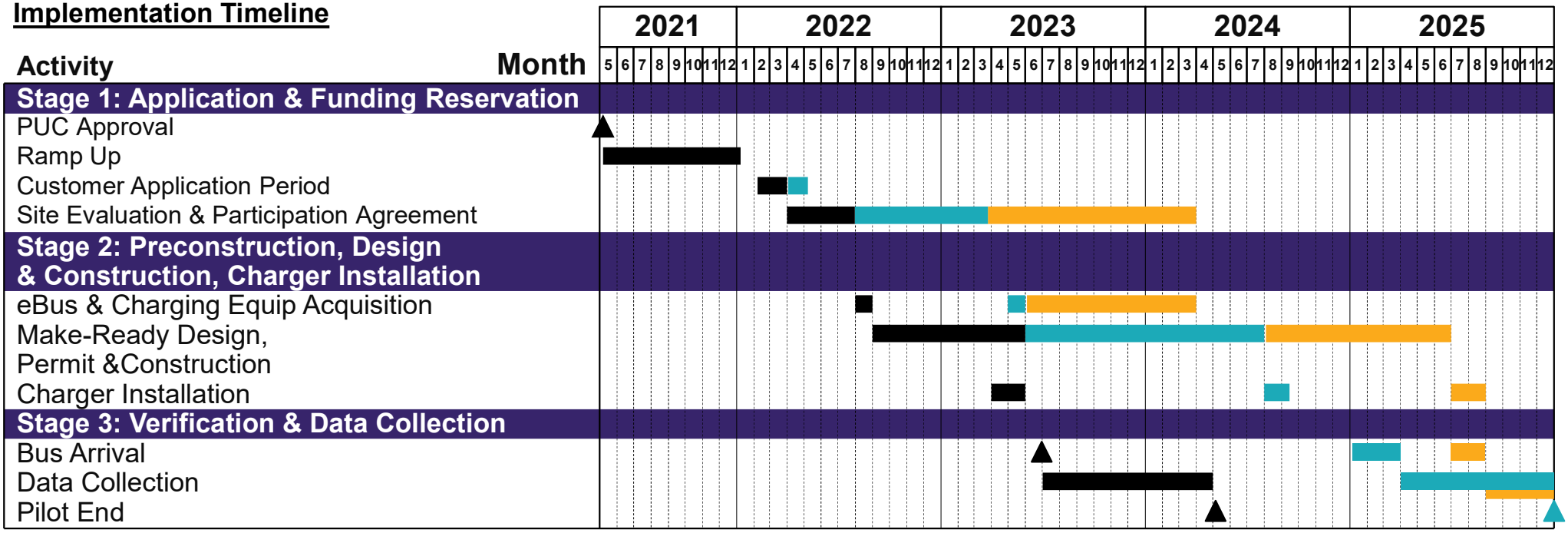
Risks

- 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



Original Implementation Schedule Adjusted Implementation Schedule Anticipated Schedule

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	Complete
Participation Agreements + Funding Reservation	12/30/23	40%
eBus/Charging Equip. (customer)	12/30/23	48%
Make-Ready Design	6/30/24	11%
Permit	3/31/25	
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		**34%**

Updated Forecast (on track)

$000s	2021	2022	2023	2024	2025	TOTAL
TOTAL	**87**	**183**	**29**	**691**	**3,242**	**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	Site 1	Site 2	Site 3
Application Received	3/31/22	3/31/22	3/6/24
Days to execute Participation Agreement (as of 3/12/24)	712	613	6
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
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), over a 3-year period, 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
- Increase enrollment in commercial EV rates
- Collect data to inform future filings
- Develop actual pilot costs and lessons learned to inform future filings

Major Deliverables

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

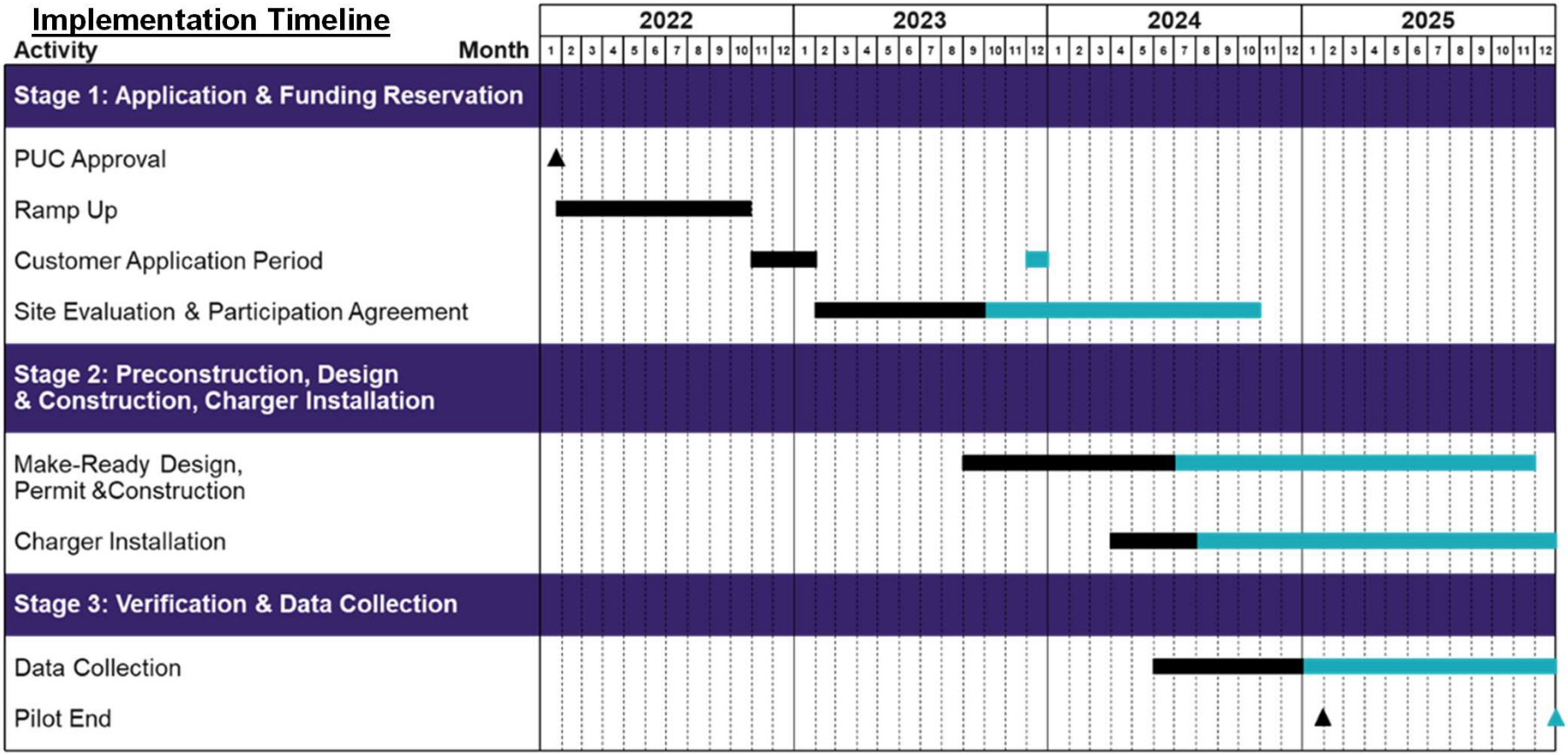
Risks:

- Complex/lengthy permitting processes (each island is unique) could impact installation timeline
- Rising labor and material costs
- 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	6/1/24	60%
Final Design	9/1/24	50%
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%**

Observations & Lessons Learned

- eBus pilot informed Commercial Make Ready implementation
  - Cost cap
  - Reduce data requirement
- Anticipate up to 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

Updated Forecast (on track)

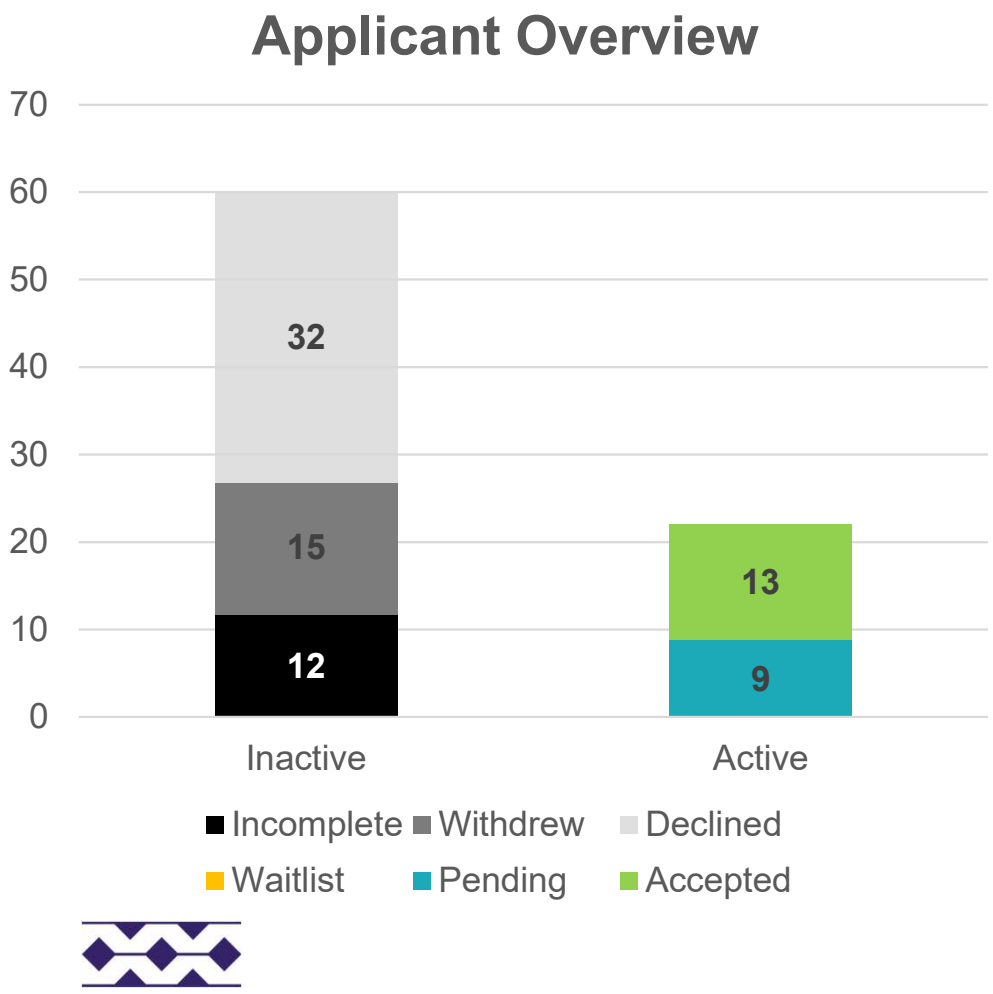
$000s	2022	2023	2024	2025	TOTAL
TOTAL	**159**	**878**	**2,476**	**1,375**	**4,888**

Next steps:

- Execute participation agreements with qualified new applicants
- Schedule construction upon permit approval

Charge Up Commercial

Division	EoT
Project Manager	Kevin Hachey



Completed Applications

	Original	New	Total
Oahu	32	7	39
Maui	14	5	19
Hawaii Island	9	2	11
Total	**55**	**14**	**69**

Accepted Sites

	Sites Accepted	Projected Total
Oahu	9	11
Maui	4	6
Hawaii Island	0	3
Total	**13**	**20**

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.

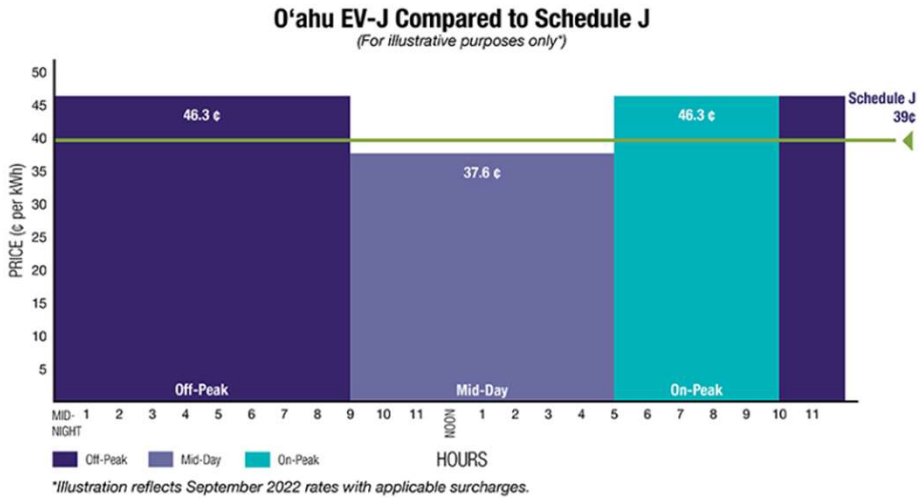
No budget.
No deliverables schedule beyond annual reports.

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

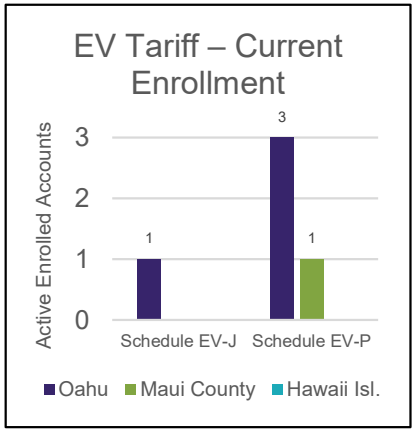
Major Deliverables:

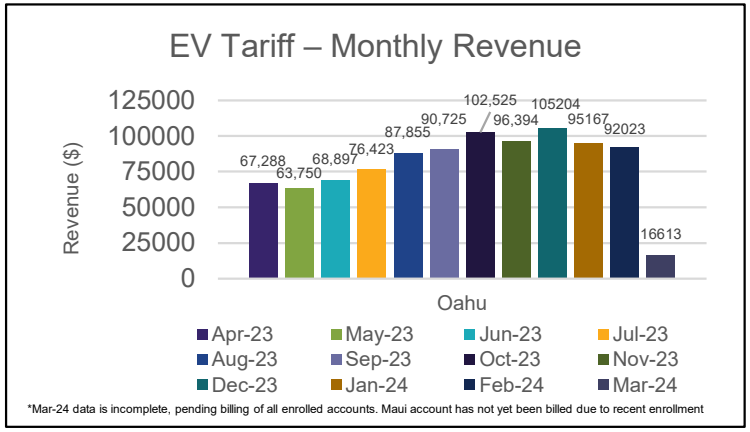
- Annual reports

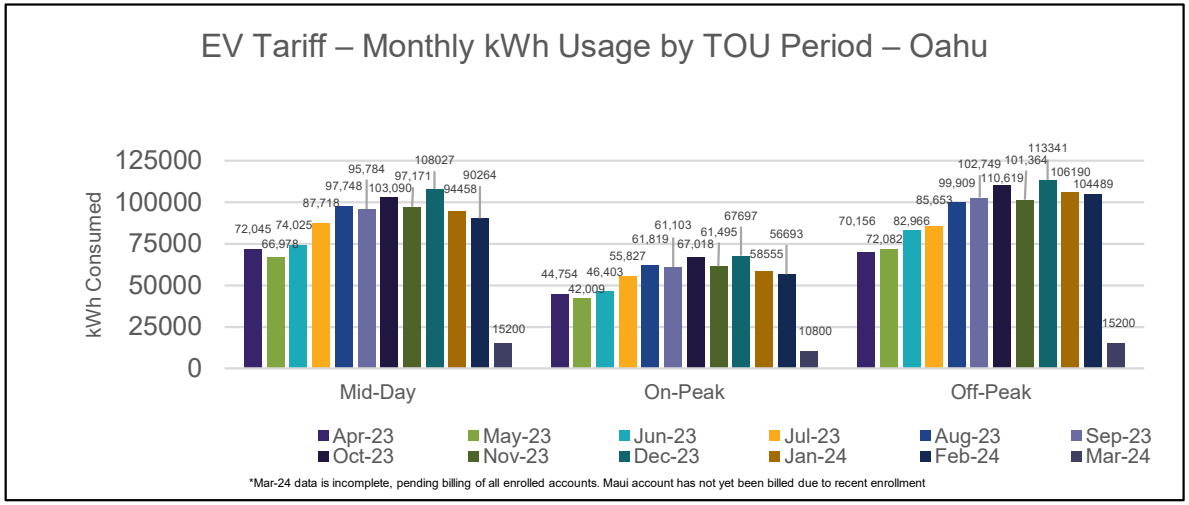


EV-J and EV-P Tariff Pilot

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.
- Despite customer interest, the infrastructure cost for a separately-metered service remains the primary barrier to enrollment.
- There is an opportunity to increase enrollment by using revenue-grade submetering to disaggregate EV charging loads from other loads.
- Removal of closed permit enrollment condition would facilitate enrollment process.

Status updates:

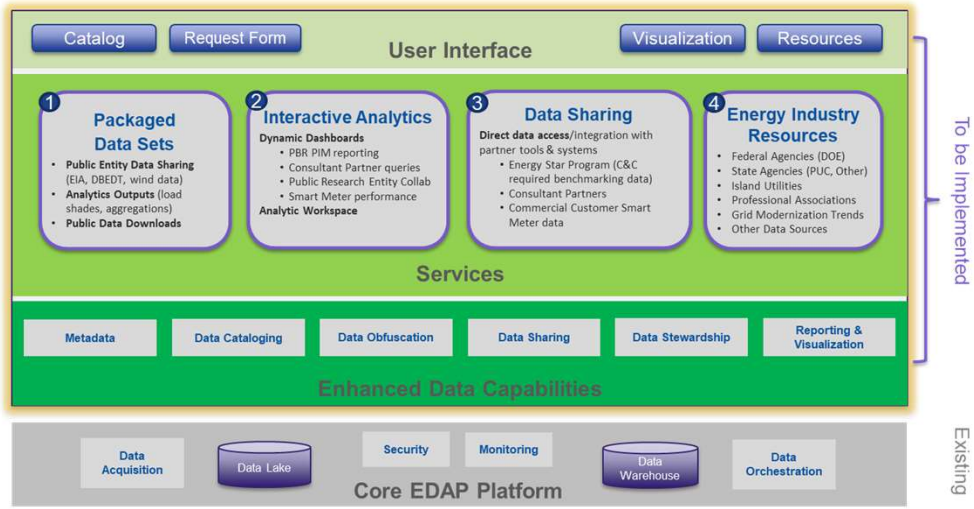
- D&O 38157 issued on 12/30/21, approving pilot
- Tariff sheets were filed 2/1/22
- PUC approved the final tariffs on 3/1/22 to go into effect on 3/18/22
- Filed proposed rates for Molokai & Lanai on 6/30/22 effective 8/1/22
- Current enrollment:
  - Oahu:
    - EV-J: 1 account
    - EV-P: 3 accounts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

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:

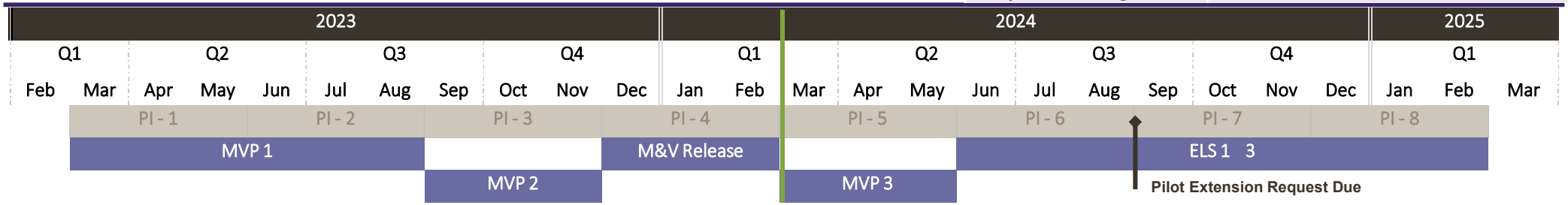
- Meet regulatory commitments & share data collaboratively
- Measure and demonstrate Clearinghouse solution model & value
- Increase data analytics maturity and useability of data as a strategic asset

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 (Mar-24): Green

Program Increment 04 completed 3/1/24

Program Increment 05 started 3/4/24

- Program Participants received guest accounts and access to Portal & Collaboration Workspace with initial Hands-on Review 2/29/24
- Available Data & Use Cases
  - Time Series Data Sharing for PII and non-PII
  - Load Profile Visualizations for Home without PV and in various PV Programs
  - Load Profile Analysis Pre/Post PV Program Participation
  - Energy Burden Report
- Pursuant to Order No. 40648, Hawaiian Electric has until August 30, 2024 to request to extend and/or expand the Pilot

Next steps:

- Evaluate & report on usage and system metrics
- Collaborate with participants on use of workspace environment
- Develop new use cases based on feedback

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	**15%**	**3/4/24**	**5/31/24**
PI-6 ELS - 1	**0%**	**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**

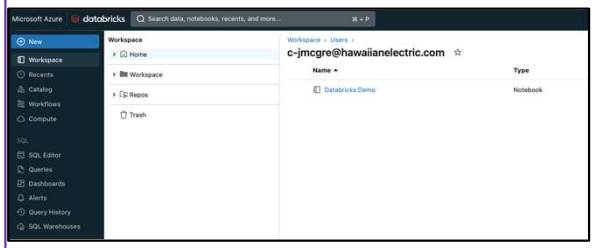
Budget Forecast (on track) – Total budget $2758

$000s	2023	2024	2025	Total
Updated Forecast	1,645	875	209	2,728

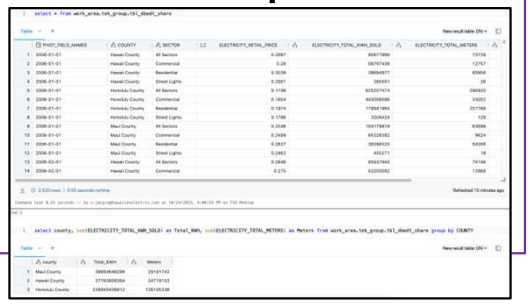
Data Analytics Clearinghouse (DACh) – Data Access

Division	Enterprise Architecture & Planning
Project Manager	Joel Wasson

Collaboration Workspace



Databricks Workspace



Data Sharing

Delta Sharing

Portal

Power BI Reporting and Visualization

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

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

ev. energy

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

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

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	**$216**	**$606**	**$822**

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 - December 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)	October/November 2023	Complete
Focus group with up to 10 participants / Survey all participants	*Updated:* April 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 3/13/2024)

Unique Drivers Connected

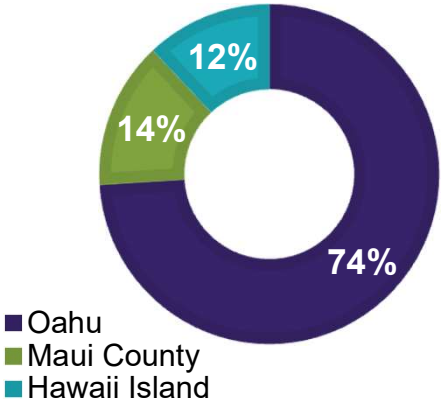
656

Devices Connected*

688

* Includes Multiple EVs in household and Smart Chargers

Service Area Distribution

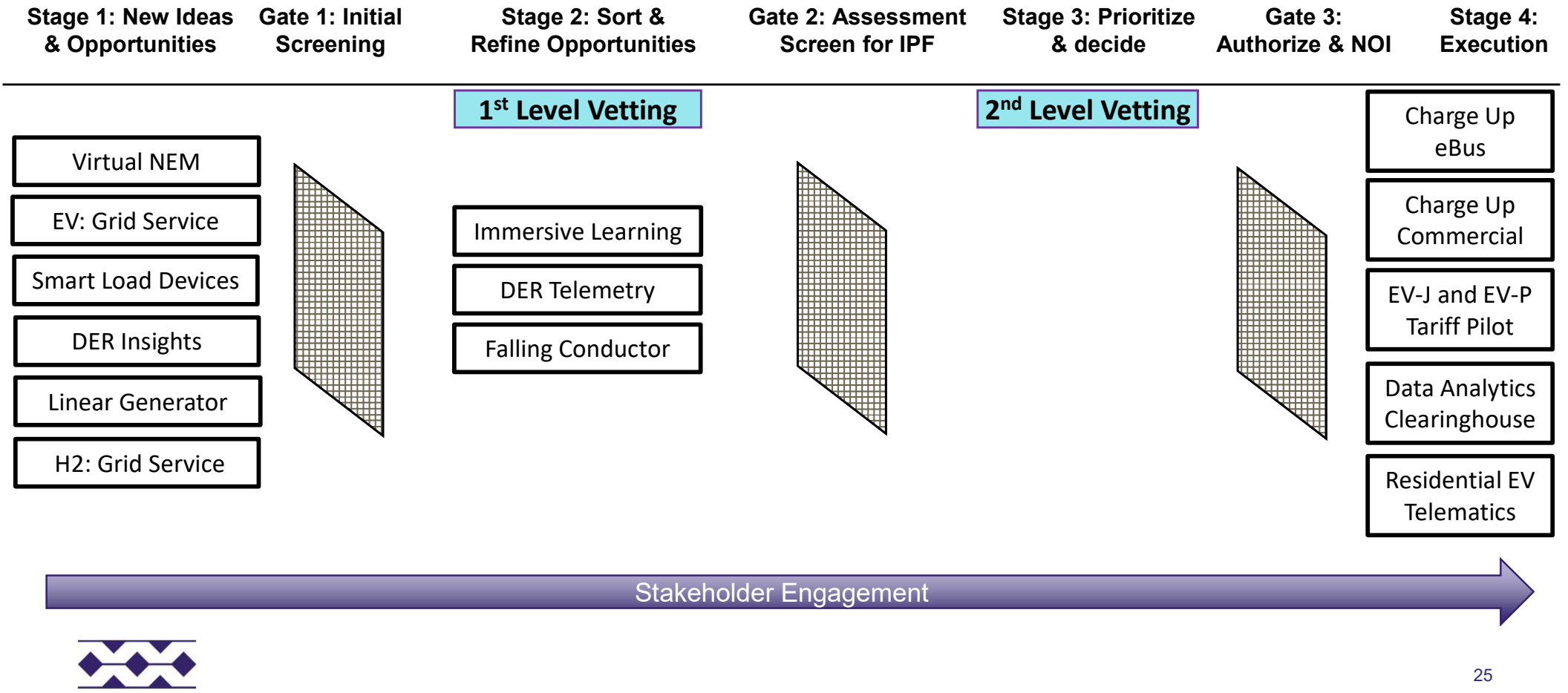


Pilot Updates

- **Large data set being prepared as a potential candidate for Data Analytics Clearinghouse.**
  - Data collected to date is available to stakeholders upon request.
- **Driver feedback surveys and focus groups expected to start in April.**
- **ev.energy retained Hawaii-based communications firm to augment education and outreach efforts.**
- **Charging data findings:**
  - Heaviest EV charging typically in mid-afternoon.
  - Approximately 70% of charging “at home” and 30% “away from home” (i.e., public charging).
  - Top 5 EVs:
    1. Tesla Model 3
    2. Tesla Model Y
    3. Nissan Leaf
    4. Tesla Model S
    5. Tesla Model X

Pilot Pipeline

Innovation Pilot Framework (IPF) pipeline status board



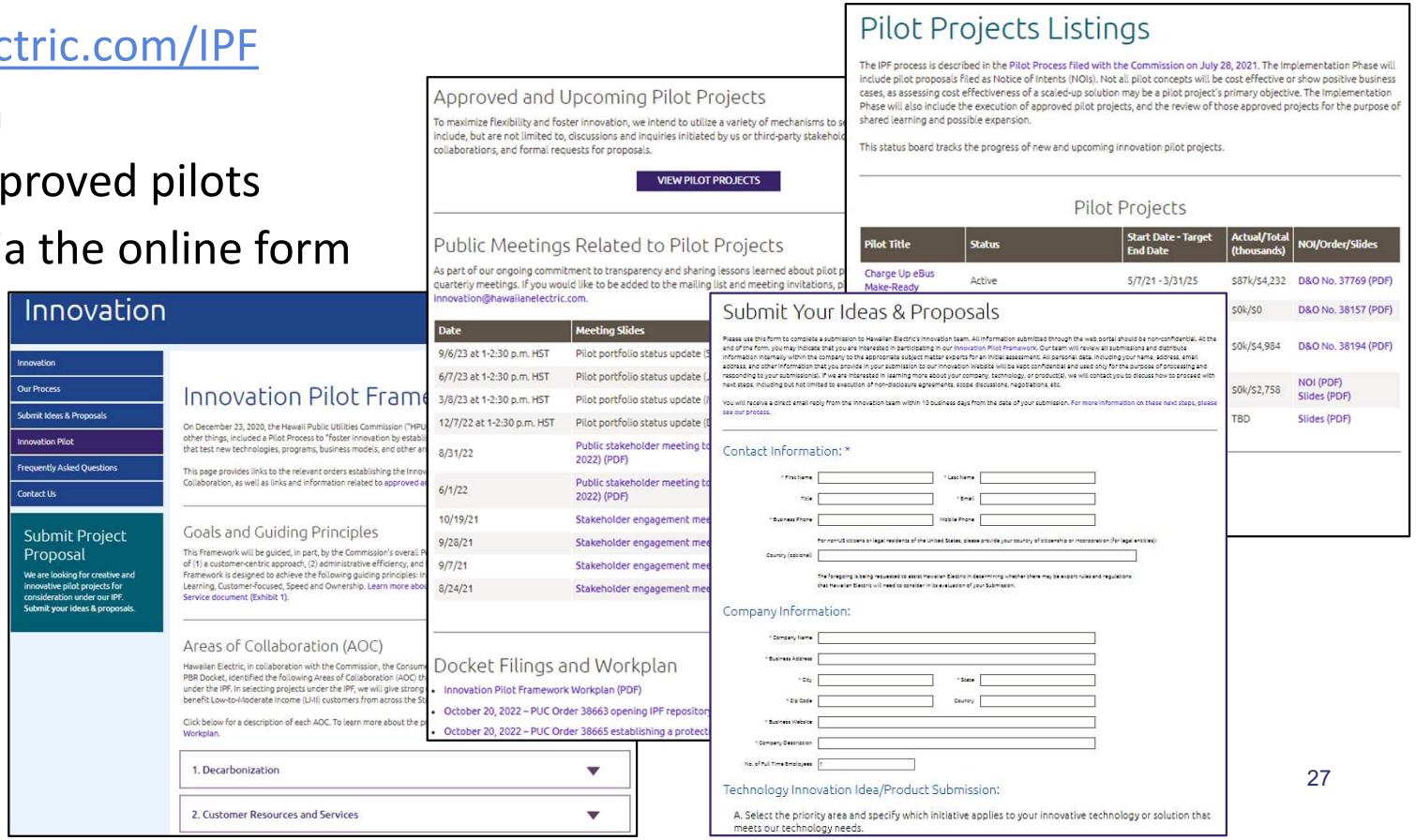
What's next?

- Next quarterly IPF stakeholder meeting: June 12 (1:00-2:30pm)
- Remaining 2024 Meetings
  - Sept. 18 (1:00-2:30pm)
  - 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