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Advanced Meter Functionality and Energy Efficiency Programs

Fall 2023

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Agenda

- ✓ AMF Plan:
  - ✓ Drivers
  - ✓ Status
  - ✓ Roadmap
- ✓ Customer Programs in an AMF World

Drivers of AMF Proposal

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Modernized System

Advanced meter data is critical for the necessary level of visibility and control of the electric grid

Operational Needs

Approximately 60% of our existing meters are at the end of their design life and need to be replaced no matter what

Climate Mandates

2021 Act on Climate requires net-zero greenhouse gas emissions by 2050; 100% Renewable Energy Standard by 2033

Customer Expectations

Customers expect to be able to easily manage their energy use and resulting utility bills; superior customer experience

Advanced Metering Functionality (AMF)

Foundational data to see grid conditions and customer needs

AMF Business Case –Status of Review

- June 2022 – September 2022: Pre-filing review of business case Docket 4770 Power Sector Transformation Advisory Group and PUC Tech Session.
- November 2022: Filed business case with the PUC (See Docket 22-49-EL available here).
- November 2022 – May 2023: Discovery, PUC Tech Sessions, Public Comment Hearing, Intervenor Statements, Testimony, Rebuttal, Surrebuttals.
- July 2023: PUC Hearings.
- September 2023: PUC approved plan with conditions, including:
  - Removal of capital expenditures for some functionalities.
  - Capital expenditures to be recovered through ISR mechanism and subject to cost cap of ~$153 M.
  - Significant accountability mechanisms.
- End of 2023: Certification and Compliance filing from RIE

AMF Roadmap

DRAFT Post 9/27/23 RIPUC Ruling & Pending Final RIPUC Certification

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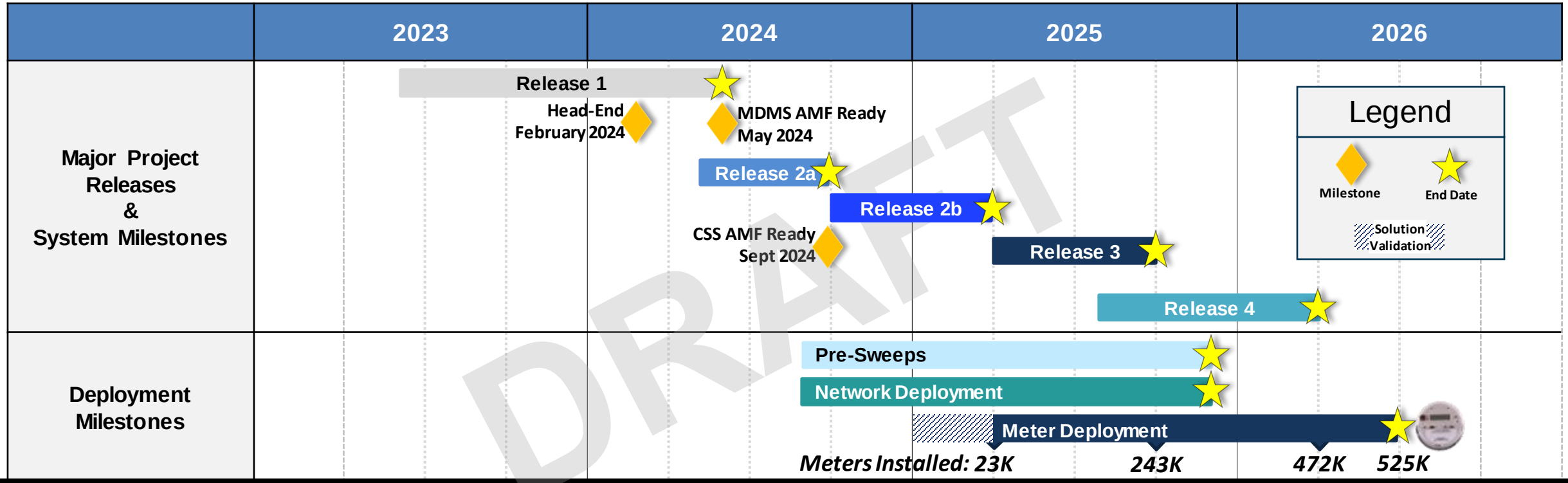

Functionality

Release 1 (@ TSA Exit (May 2024))	Release 2a (September 2024)	Release 2b (March 2025)	Release 3 (September 2025)	Release 4 (March 2026)
▪ Deployment Exchange Management Solution ▪ Remote Meter Configuration ▪ AMO Data Driven Operations	▪ Remote (AMF) Meter Reading & Billing ▪ Deployment Exchange Management Solution (cont'd) ▪ Alerts & Alarms: High Temp Alerts ▪ Customer Portal (AMF)	▪ Proactive Outage Mgmt. (Last Gasp / Power Up) ▪ Customer Outage Alerts ▪ Remote Connect & Disconnect ▪ CP: Bill Alerts	▪ CP: Green Button Connect ▪ CP: Near Real Time Data Access ▪ CP: In Home Device Support ➢ Customer Load Disaggregation via Sense App	▪ ADMS: Volt-Var Optimization ▪ ADMS: Sag/Swell ▪ ADMS: On Demand Voltage Measurement ▪ ADMS: DER Monitor & Management ▪ Network Model Analytics ▪ Theft Detection Analytics

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Customer Portal

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3 Key Components of the Customer Portal

Personalized Insights

- Ability to view current and historical energy usage in a graphical format
- Analytics - weather, price
- Bill education - how to review and analyze an energy bill
- Share billing and energy data with third parties via GBC

Tools

- Assists customers with their pricing plans and energy expenses through calculators, reporting, and forecasting
- Ability to set communication preferences for notifications related to energy usage, high-usage alerts, and future energy-related events (e.g., critical peak pricing events)

Integrated Customer Actions

- Empowers customers to take educated actions based on the personalized insights and tools within the Portal.
- Enrollment in demand response and energy efficiency programs
- Purchases from established marketplaces for energy-saving technologies

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Customer Programs in an AMF World

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Initial Enhancements

Customer Targeting
- Qualification.
- Marketing.
- Trade ally leads.

Customer Engagement
- More detailed, personalized HERs.

Faster Data Access
- Facilitate program design and reporting.

Enabled by Release 2a & 2b

Program Evolution

Program Design
- Expanded P4P programs.

Program Management
- Mid-year course adjustments.
- More precise quantification of impacts.

Customer Engagement
- Additional insights in customer portal.
- Layer customer portal activities with existing programs.

Enabled by Release 3

The Next Generation

Enabling Enhancements
- New rate structures
- Advanced EM&V
- Apps on the meter

Program Design
- Market-based programs (NMEC).
- BTM devices connected to the HAN.

Building on Release 3

AMF in EE Planning Cycle

2024

Increase familiarity with targeting and P4P concepts.

Research and plan for pilots to launch in 2025.

2025

Begin exploring program designs through pilots with customers who have received AMF meters, leveraging available functionality as it is released (Releases 2b, 3, and 4 develop throughout 2025).

2026

Continue pilots.

Launch additional pilots based on enhanced functionality deployment (Release 4 develops throughout 2026).

Identify potential for full programs to launch in 2027 based on pilot learnings.

2027-2029 Plan Cycle

Launch programs based on available functionality, given territory-wide deployment of meters.

Explore and evolve further into next-generation, AMF-enabled programs.

Case Study: Normalized Metered Energy Consumption (NMEC) in California

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Early 2010's
- AMF Deployment.

2015
- State laws make P4P the primary method for EE, leading to the emergence of "normalized metered energy consumption" (NMEC) protocols.

2018, 2020
- CPUC releases NMEC Rulebook v1.0, then v2.0.

2021
- CPUC requires utilities to create "Market Access" programs; "FLEXmarkets" launched.

2023
- CPUC orders all EE programs to use meter-based methods, unless not feasible or not cost-effective, starting in 2024.

June 2023 CA FLEXmarket results:
- >2x "Total System Benefit" per MWh saved.
- 102% realization rate

"benefits to the energy efficiency portfolio of the market access approach include:

- *Providing a **streamlined pathway** for energy efficiency aggregators to participate in energy efficiency portfolios and deliver projects[…];*
- *Allowing for **market innovation** that can be fast-paced and implemented quickly by aggregators;*
- *Rewarding aggregators based on the **benefits their projects deliver to the grid**[…];*
- *Encouraging **market competition** […]which will result in **continuous improvements** to the program delivery and customer experience;*
- ***Minimizing ratepayer risk** because aggregators are only paid based on measured savings; and*
- ***Minimizing risk of portfolio underperformance**, acting as a hedge against underperformance"*

CPUC Decision 23-06-055

References:
https://www.demandflexmarket.com/june2023.html
https://www.canarymedia.com/articles/energy-efficiency/california-sees-success-tying-energy-efficiency-rebates-to-real-results
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M512/K907/512907396.PDF

Appendix

AMF: Solution Elements

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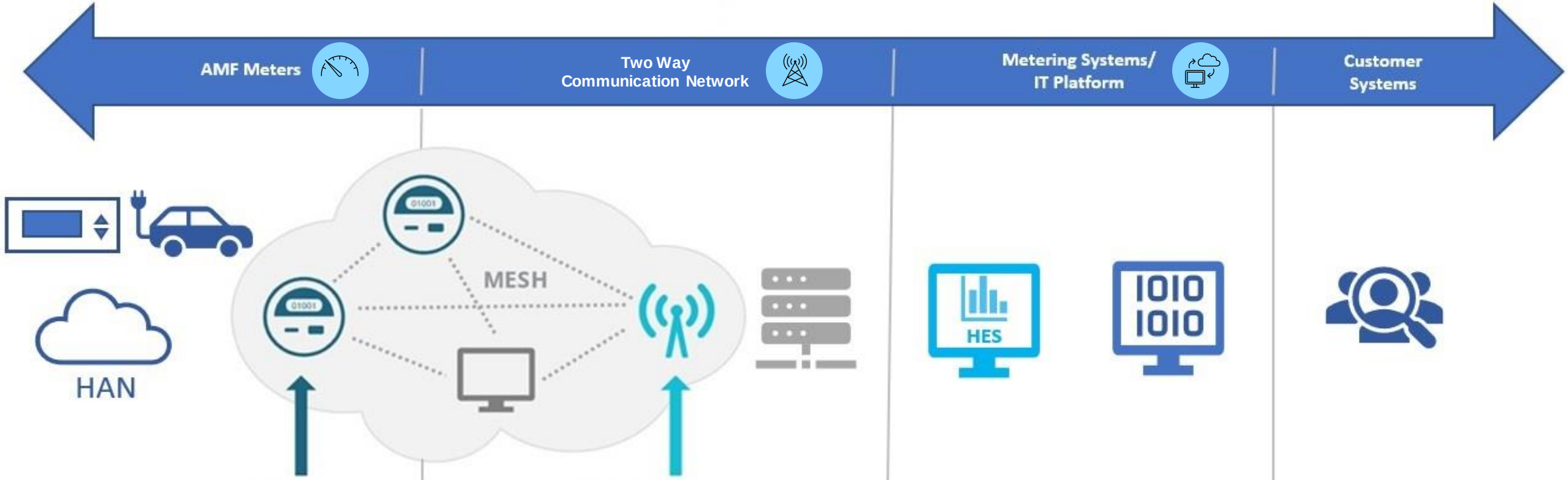

Behind the Meter Devices

Creating customer visibility to Home Area Network (HAN) technologies via Wi-Fi including real time consumption, DERs, EVs, etc.

AMF Meters

- Bi-directional
- Residential
- Commercial
- Industrial

Radio Frequency Mesh Network

Communication between meters, routers, mesh extenders, and Gateways

Network Backhaul

Infrastructure between Gateways and utility head-end: a.k.a. WAN

Collection of necessary networking components that enable secure communication from meters and routers to the head-end system

AMF Head End System

Collects meter data, identifies and collects gap data, allows for meter management and monitoring

Meter Data Management System(MDMS)

VEE (Validation, Estimation, and Editing) of meter data

Provides 'Bill Ready' customer data

Customer Service System(CSS)

Customer billing data

Customer Portal

- Energy Insights
- Energy Alerts
- Green Button