



**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Modernize
the Electric Grid for a High Distributed
Energy Resources Future.

Rulemaking 21-06-017

FILED

07/14/26

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R2106017

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E) RESPONSE TO
ASSIGNED COMMISSIONER AND ADMINISTRATIVE LAW JUDGE'S RULING
REQUESTING COMMENT ON ASSIGNED COMMISSIONER'S PROPOSAL ON
FLEXIBLE SERVICE CONNECTIONS**

(PUBLIC VERSION)

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Attorney for
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Dated: July 14, 2026

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(PUBLIC VERSION)**

Pursuant to the *Assigned Commissioner and Administrative Law Judge’s Ruling Requesting Comment on Assigned Commissioner’s Proposal on Flexible Service Connections* (Ruling), filed July 7, 2026, and Administrative Law Judge Regnier’s July 10, 2026 emailed ruling granting schedule modifications, Pacific Gas and Electric Company (PG&E) provides its responses to questions presented in Section 3 of the Ruling.

I. PG&E RESPONSES TO QUESTIONS PRESENTED

1. What are the Final Workstreams, Use Cases, and Target Customer Profiles?

As noted in the Ruling, PG&E’s 2024 EPIC Annual Report stated that PG&E hosted a series of workshops with the technology providers that defined workstreams, identified and refined use cases, and confirmed target customer profiles.¹

Pursuant to this request, PG&E provides the following attachments that detail the current iteration of the workstreams, use cases, and target customer profiles.

- a. PG&E shall file the existing materials associated with and any work products that resulted from this series of workshops and associated technology partner collaboration(s).**

In response to this request, PG&E includes the following attachments:

¹ *Assigned Commissioner and Administrative Law Judge’s Ruling Requesting Comment on Assigned Commissioner’s Proposal on Flexible Service Connections* (Ruling), p. 5 (July 7, 2026).

Att. #	Title
A	REDACTED Socket of the Future Workshop 9-2023
B	CONF Smart Meter EV Charger Protocols Recap 10-2023
C	CONF Correspondence on EV Charger Protocols 10-2023
D	CONF Meter EVSE integration design 2-2024
E	CONF EV Connect Workshop Agenda Final 6-2024
F	CONF PGE Technical EV Connect Workshop 6-2024
G	CONF EV Connect Deck Day1 6-2024
H	CONF EV Connect Deck Day2 6-2024
I	CONF Workshop Notes 6-2024

II. CONCLUSION

PG&E appreciates the opportunity to provide these responses to the questions posed in the Ruling. PG&E looks forward to continuing to review these responses with the Commission and Stakeholders.

Respectfully Submitted,

BENJAMIN C. ELLIS

By: /s/ Benjamin C. Ellis

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Dated: July 14, 2026

Attorney for
PACIFIC GAS AND ELECTRIC COMPANY

Attachment A

Socket of the Future Workshop 9-2023
(Redacted)

Socket of the Future Part 2

September 11th, 2023



Chris Moris and Quinn Nakayama
GRiD

Our goals

Gain a mutual understanding of the use cases for Socket of the Future to enable [REDACTED] and [REDACTED] to create a roadmap by 9/28 to meet our needs

Agenda

<u>Lunch</u>	11:30 AM to 12:30 PM
<u>Intros & Background</u>	12:30 PM to 1:00 PM
<u>Use case review</u>	1:00 PM to 3:30 PM
<u>Next steps</u>	3:30 PM to 4:00 PM

Before we begin...

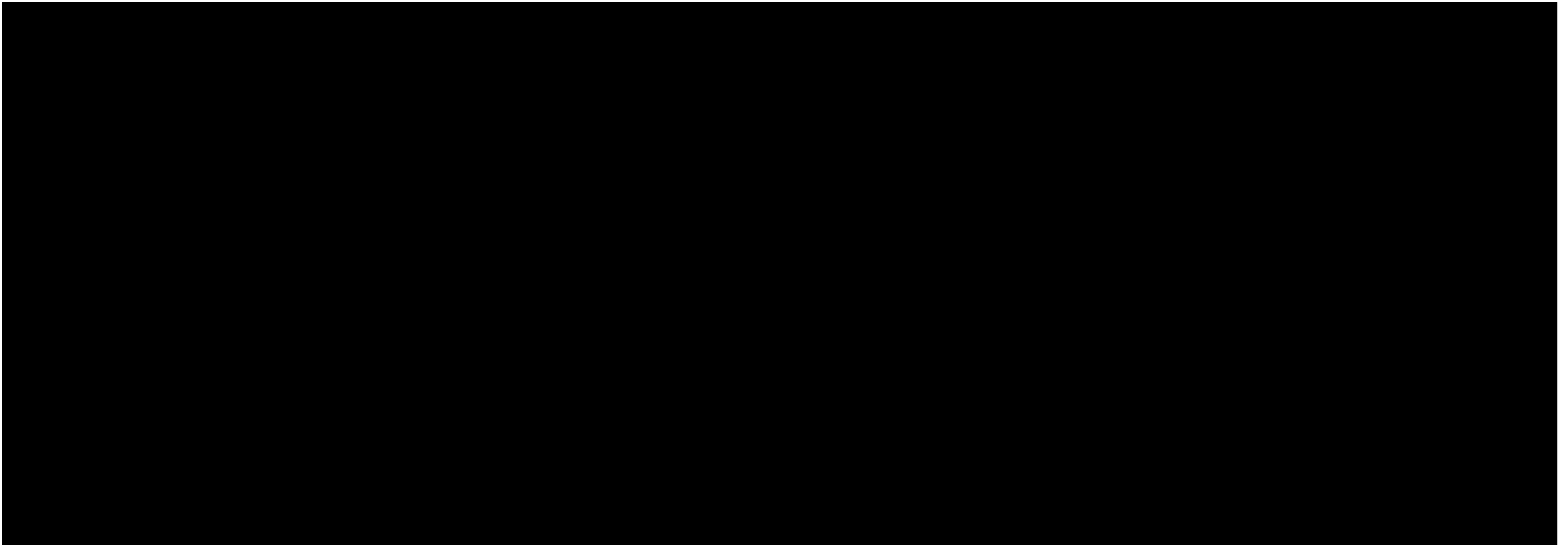
- Identify a note taker
- Introductions



Introduction

Start 12:30 PM
End 1:00 PM

Our load is forecasted to grow ~70% by 2040...



Driven by new load types... that are controllable at the grid edge.

Vehicle



■ of flexible load in 2040

Solar & Storage



■ of flexible load in 2040

Electrification



■ of flexible load in 2040

Near-term
foundational

Long-term
growth

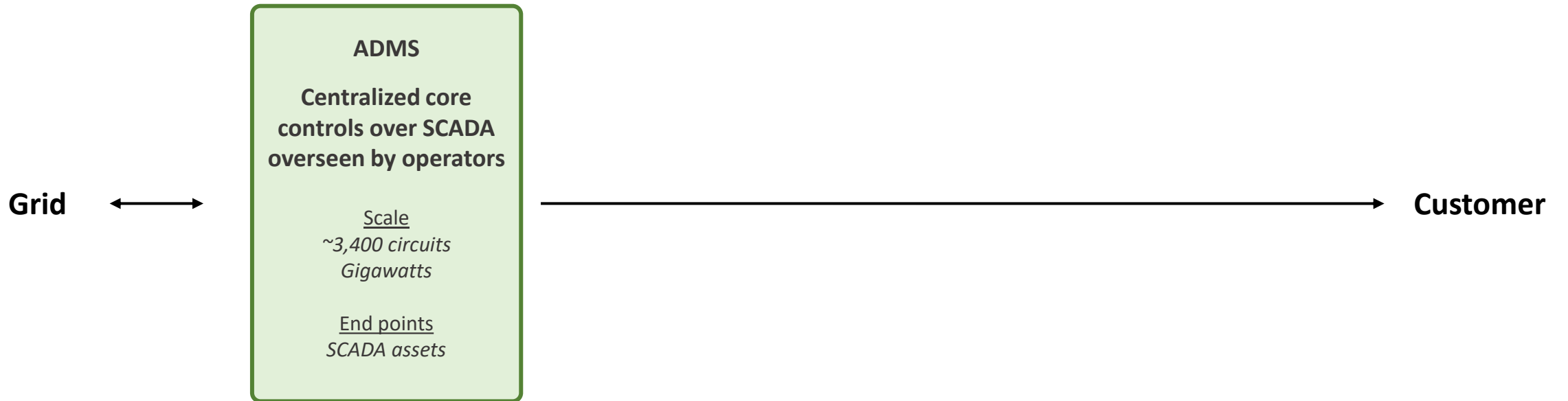
Achieving our goals will require customer loads to interact with the grid.

Grid

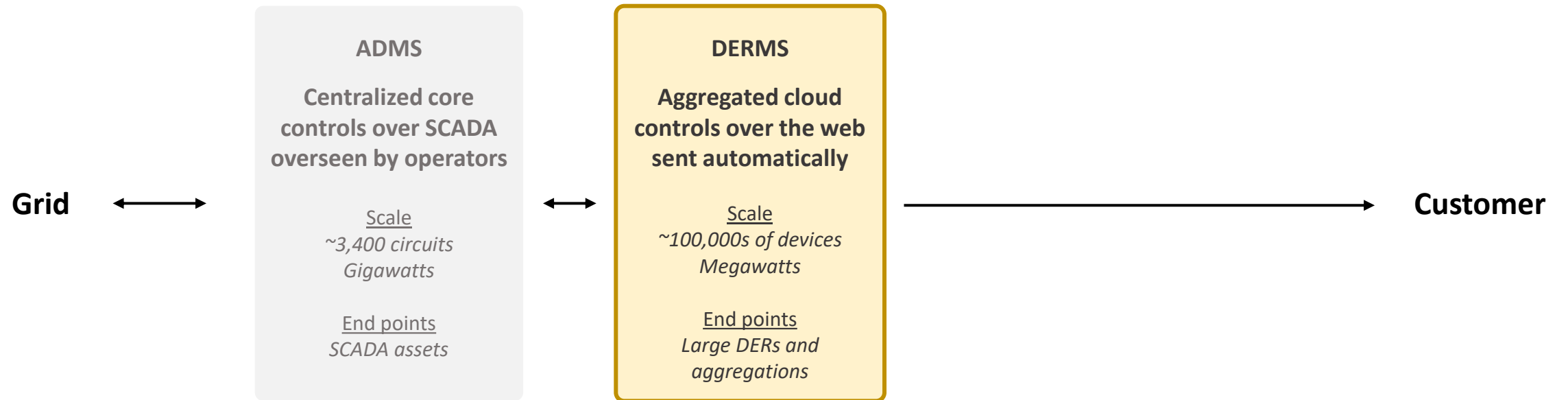


Customer

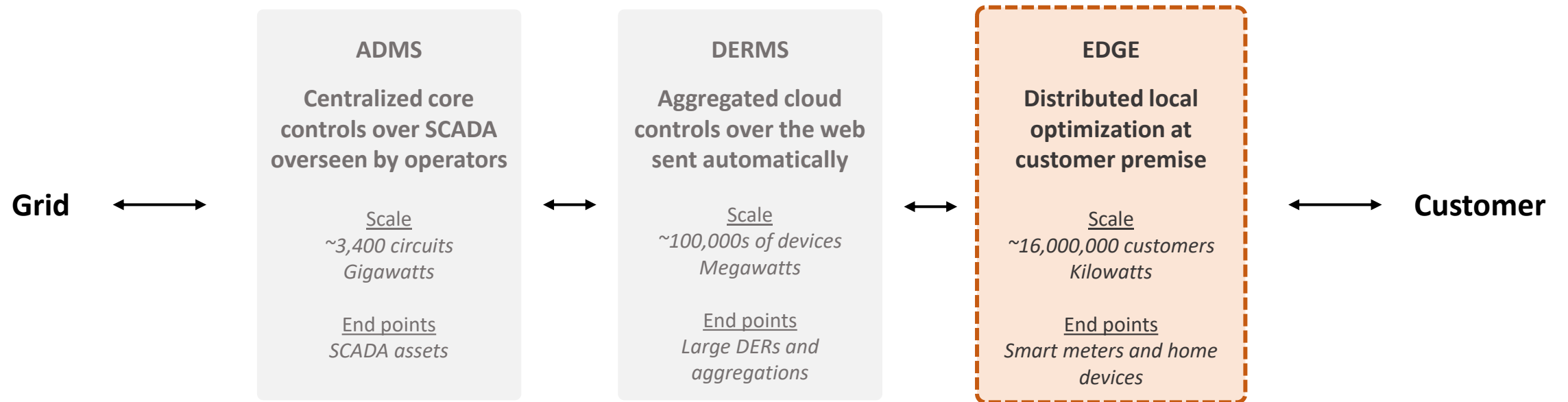
Today...

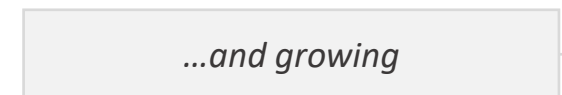
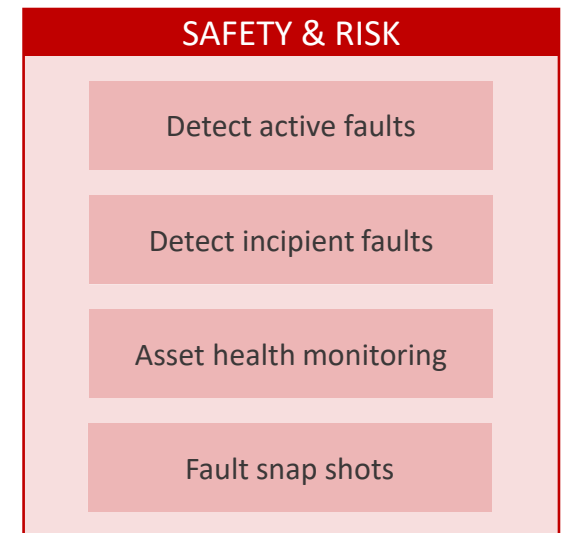
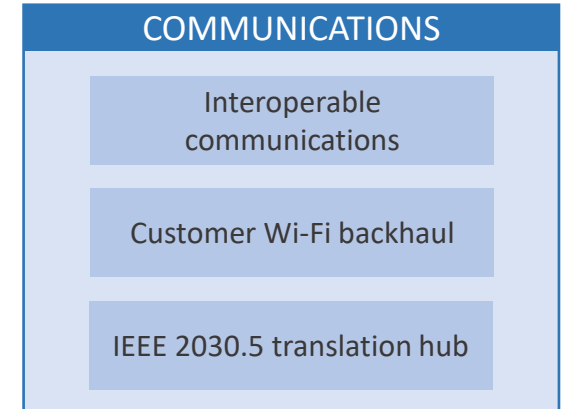
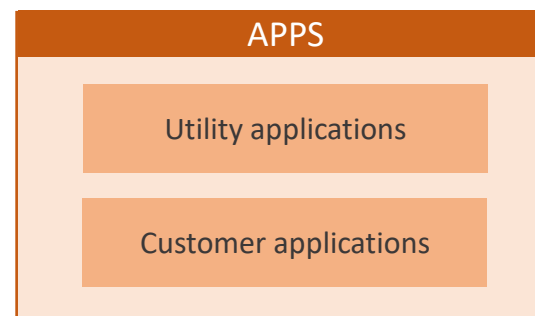
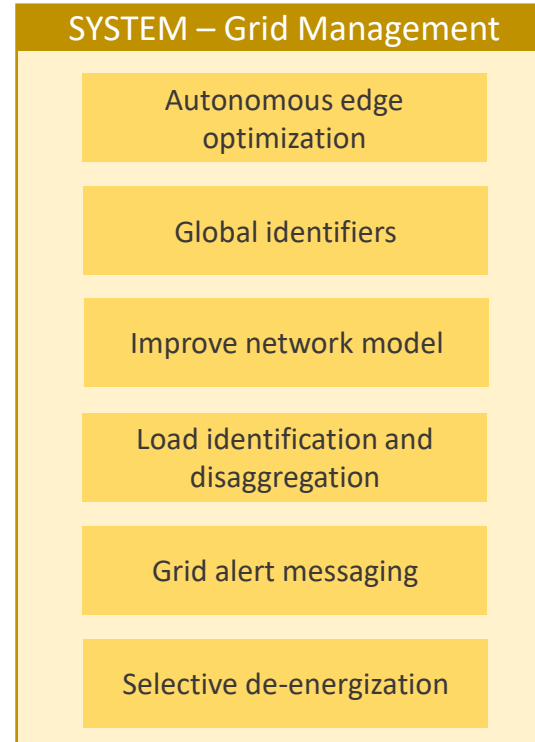
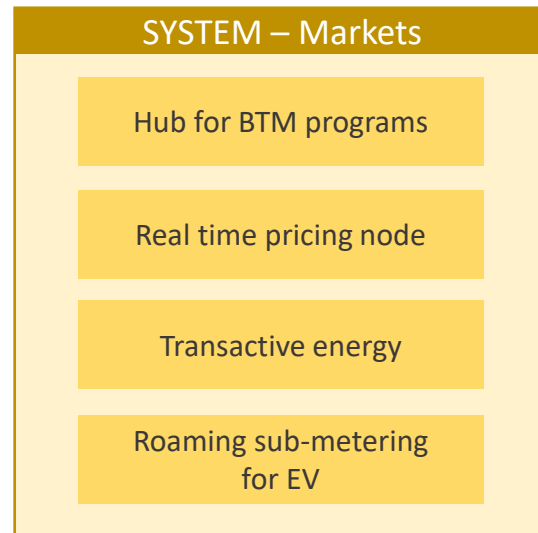
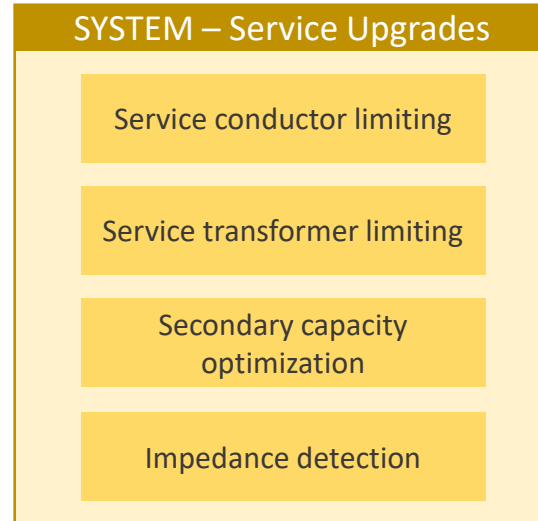
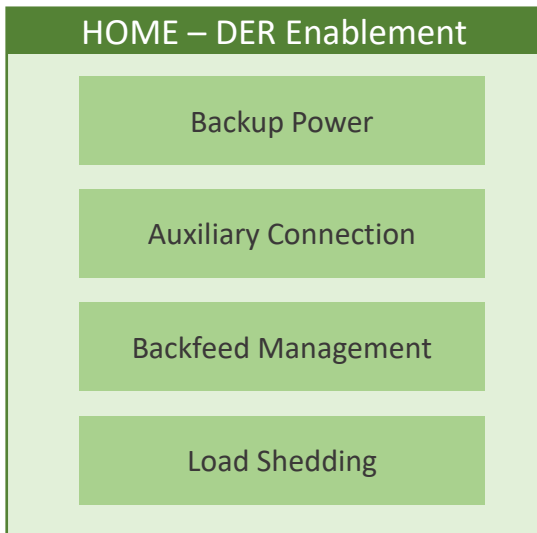
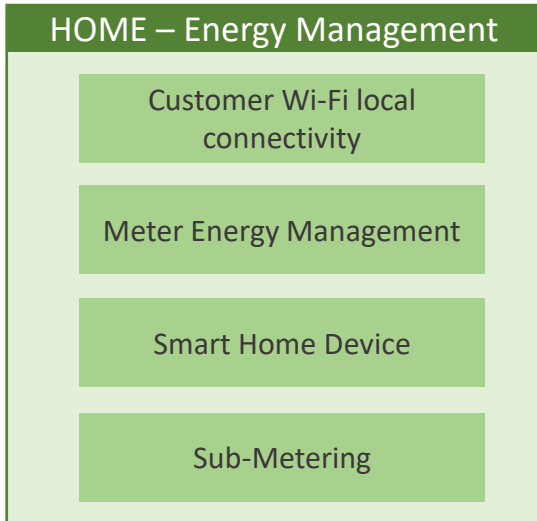


Near future...



...where we need to go.







Home – Energy Management

Start 1:00 PM
End 3:30 PM
10% complete

Objective: Connectivity into the customer’s home to interface with, report data from, or control customer owned DERs.

Principles:

- Work with the devices and ecosystems customers want
- Experiences in line with best-in-class offerings (e.g. we shouldn’t offer 1 minute load monitoring resolution if 1 second is expected)
- Capture the data at the edge, bring back what is valuable/needed

#	Capability	Description
1	Customer Wi-Fi local connectivity	Meter joins customer Wi-Fi for real time local data acquisition and control
2	Meter energy management	Devices connect to the meter to read limits or be controlled directly
3	Smart home device	Meter joins ecosystems as a smart home device
4	Sub-metering	Hub for other metering devices to report load



Home – DER Enablement

Start 1:00 PM
End 3:30 PM
20% complete

Objective: Lower the cost and complexity for DERs and new load to join the network

Principles:

- Avoid customer side electrical work and panel upgrades
- Support new paths for customers to connect
- Optional meter types when needed

#	Capability	Description	
5	Backup power	Islanding relay inside the meter controllable by the DER and utility	
6	Backfeed management	Coordination of DER output ensuring panel is not overloaded	
7	Auxiliary 200A connection	200A lugs and flexible conductor for a new 200A panel	
8	Load shedding	During emergency events auxiliary lugs load can be shed	



System – Service Upgrades

Start 1:00 PM
End 3:30 PM
30% complete

Objective: Enable new loads to connect immediately without expensive upgrades

Principles:

- Automated detection, calculation, and configuration of service limits on the meter
- Connect >95% of customer load in under a month safely
- Provide data needed to detect which assets should be upgraded vs. mitigated

#	Capability	Description
9	Service conductor limiting	Real time dynamic kW limit to bring on new load while protecting customer service wire
10	Service transformer limiting	Dynamic kW to bring on new load without damaging transformer
11	Secondary capacity optimization	Prioritization of available transformer capacity based on need/impact
12	Impedance detection	Detection of conductor type, ampacity, and hosting capacity

Objective: Enable markets to form efficiently at the distribution grid edge and home level

Principles:

- Open pathways for distribution market integrated products to form (e.g. efficient markets)
- Customer preferences allowing for autonomous response at the edge of the grid

#	Capability	Description
13	Hub for BTM programs	Interface point for market connected energy management
14	Real time pricing node	Meters along a feeder negotiate amongst themselves to determine the price of power on the segment in real time
15	Transactive energy	Surplus generation and attributes can be traded amongst customers
16	Roaming sub-meter for EVs	Subtractive billing and association of load between accounts

Objective: Autonomously manage grid capacity, asset health, and customer load at the edge of the grid

Principles:

- Smart meters handle local optimization
- Data and control aggregation roll-ups to the DERMS level
- Alerts for edge conditions pushed up

#	Capability	Description
17	Autonomous edge optimization	Meters along a feeder negotiate amongst themselves to achieve local, distribution, and transmission outcomes
18	Global identifiers	Data, calculation, and analysis of every segment between substation and customer
19	Improve network model	Identification of missing network data via high frequency analysis
20	Load identification and disaggregation	High frequency analysis of smart meter data to create load profiles by device



System – Grid Management (continued)

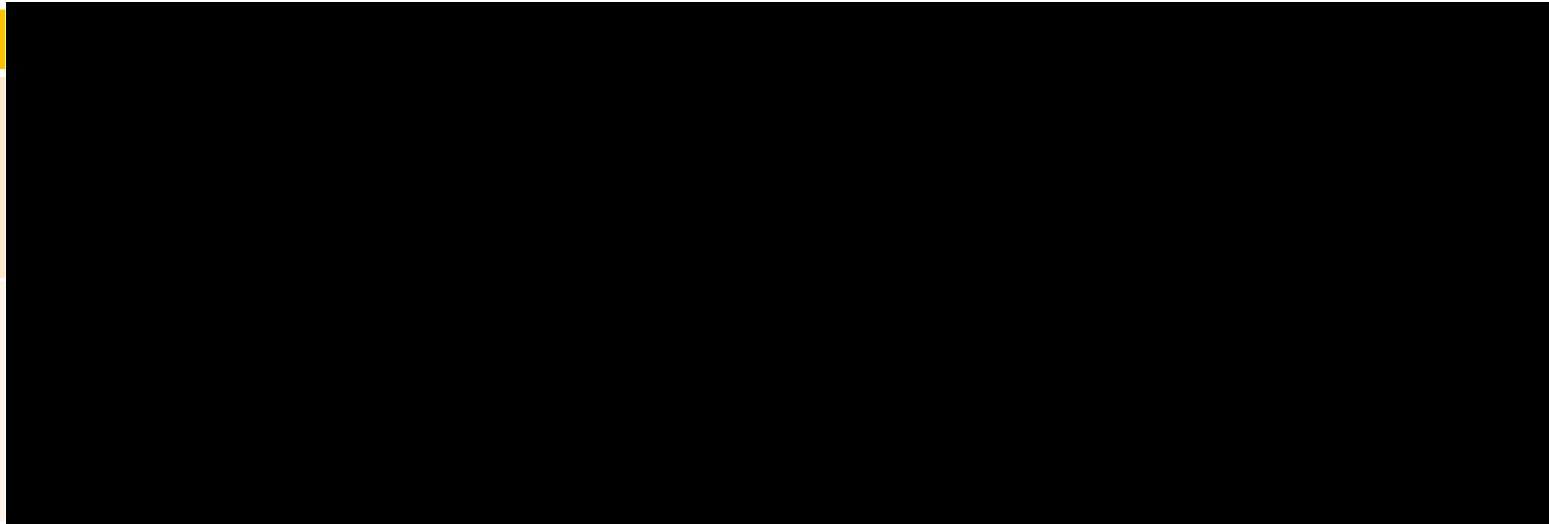
Start 1:00 PM
End 3:30 PM
60% complete

Objective: Autonomously manage grid capacity, asset health, and customer load at the edge of the grid

Principles:

- Smart meters handle local optimization
- Data and control aggregation roll-ups to the DERMS level
- Alerts for edge conditions pushed up

#	Capability	Description
21	Grid alert messaging	Real time alerts pushed to devices and customers
22	Selective de-energization	Targeted de-energization in emergencies or for microgrid operations



Objective: Scale edge computing capabilities

Principles:

- Support growing/changing set of capabilities to be deployed in parallel
- Benefit from the work of other utilities and developers
- Must be cyber secure with robust application management and conflict detection

#	Capability	Description
23	Utility applications	1 st party grid management applications
24	Customer applications	3 rd party developer written apps incorporating the meter into their DER ecosystem

Objective: Provide pathways for DER orchestration, edge computing, and next generation customer experiences

Principles:

- Sufficient bandwidth to enable the experiences customers/developers want and to support future edge applications
- Standardized communications to avoid “one off” integrations

#	Capability	Description
25	Interoperable communications	Standard protocol to allow for on-site data transfer and control between devices and meter
26	Customer Wi-Fi backhaul	Enable bi-directional communications from the meter back over customer ISP
27	IEEE 2030.5 translation hub	Messaging bus to allow for OCPP, Sunspec Modbus, OpenADR, and other standard communications paths

Objective: Identify unsafe or damaging conditions immediately

Principles:

- Identify early indicators to avoid incidents and failures before they happen
- Provide actionable insights to best resolve active incidents

#	Capability	Description
28	Detect active faults	Real time monitoring and notification of fault conditions
29	Detect incipient faults	Actionable alerts ahead of an active fault
30	Asset health monitoring	Build digital twins of assets and line segments and compare model vs. actual performance
31	Fault snap shots	Multiple meters capture fault performance during event for analysis

Next Steps



Together, Building
a Better California

Attachment B

Smart Meter EV Charger Protocols Recap

Oct. 2023

(Fully Confidential)

Attachment C

Correspondence on EV Charger Protocols

Oct. 2023

(Fully Confidential)

Attachment D

Meter_EVSE_integration_design

Feb. 2024

(Fully Confidential)

Attachment E

EV Connect Workshop Agenda Final June 2024 (Fully Confidential)

Attachment F

PGE Technical EV Connect Workshop

June 2024

(Fully Confidential)

Attachment G

EV_Connect_Deck_Day1

June 2024

(Fully Confidential)

Attachment H

EV_Connect_Deck_Day2

June 2024

(Fully Confidential)

Attachment I

Workshop Notes

June 2024

(Fully Confidential)