Mid-Term Evaluation:
SCE Dynamic Rate Pilot

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Presentation Outline

1. Pilot Overview
2. Evaluation Requirements
3. Participant Summary
4. Load Response Analysis
5. Bill Impact Analysis
6. Cost Recovery Issues
7. Stakeholder Comments

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1. Pilot Overview

- Three-year dynamic day-ahead hourly pricing pilot (2022 – 2024)
- Open to residential, commercial, and industrial customers
- Two-part pricing method (based on CPUC CalFUSE concept)
  - Purchase "subscription" (a fixed quantity of electricity) priced at an Otherwise Applicable Tariff (OAT) equivalent "legacy" rate
  - During intervals when the customer's usage differs from the subscription quantity, the customer will be billed (or will be credited) the ex-post dynamic hourly price for the difference (settlement transactions)
  - Settlements are conducted for every five-minute interval of the day
  - Pilot allows for day-ahead and hour-ahead bi-lateral binding transactions as well (tenders), but these did not occur during the analysis period

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1. Pilot Overview:
Settlement Example
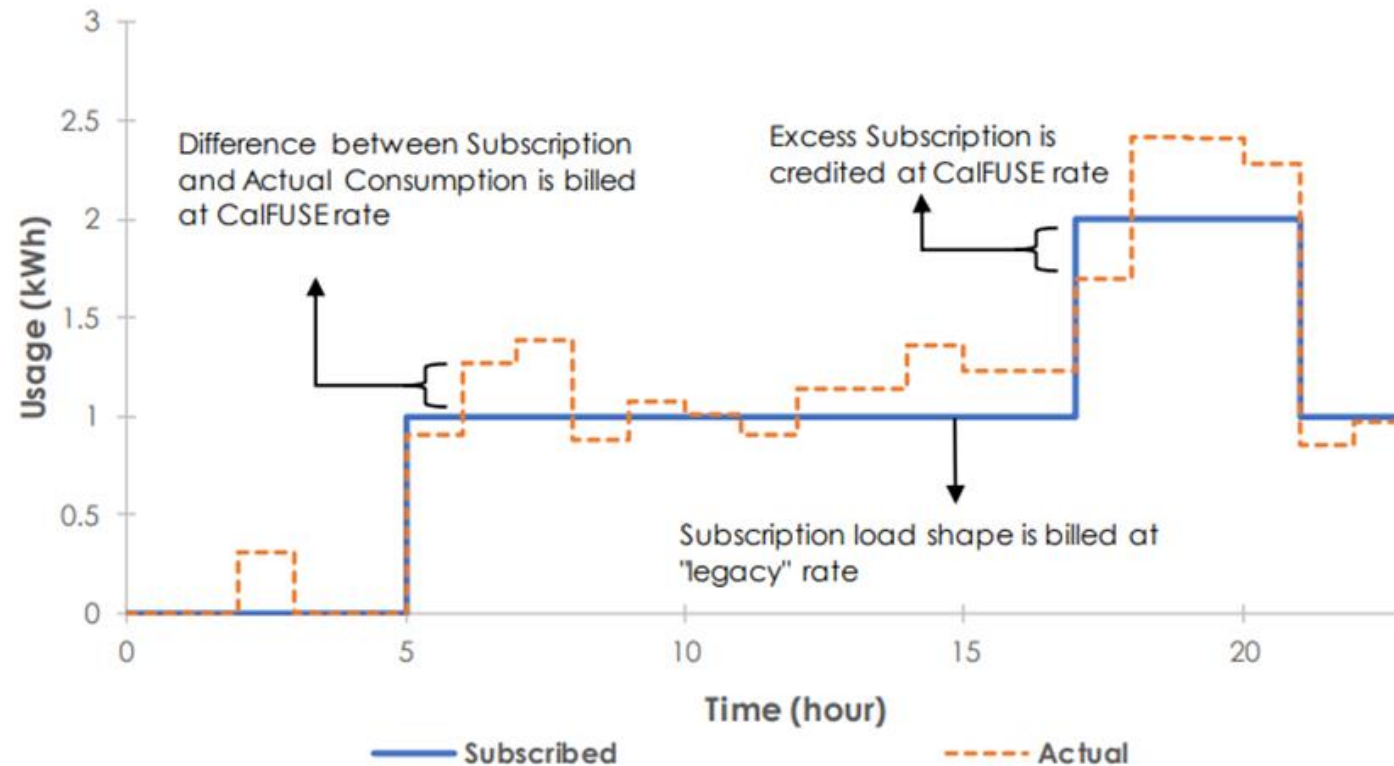
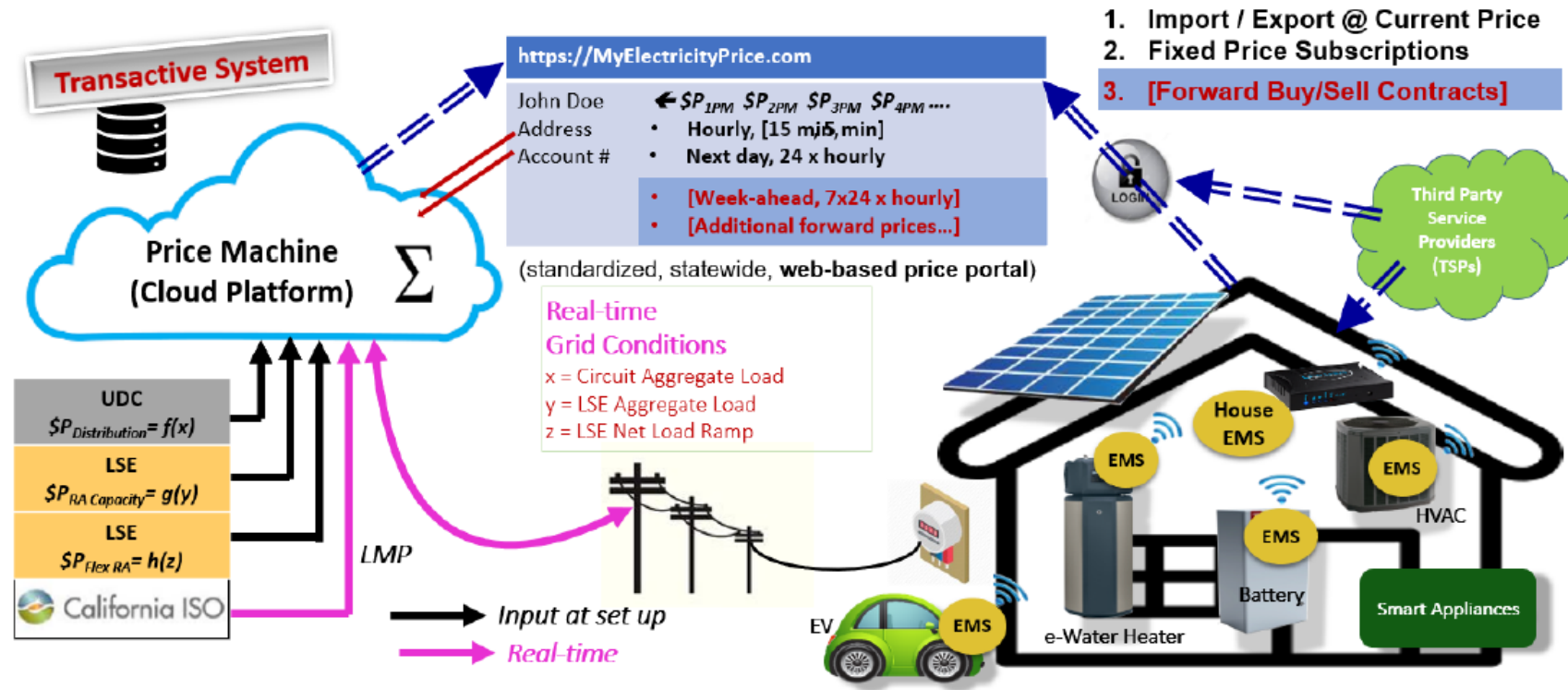# 1. Pilot Overview:
Technology Enabled Price Response

Figure 4-8: Graphical illustration of the CalFUSE framework, including the transactive elements.

2. Evaluation Requirements

- Decision D.21-03-056 (March 25, 2021) approved the pilot and required mid-term and final evaluations

- Evaluation requirements
  - An evaluation of **load responsiveness**. SCE should evaluate the efficacy of the Pilot tariff in shifting loads enrolled in the program from peak to off-peak periods and should be compared to non-participant loads.
  - The monthly **bill impacts** of the Pilot dynamic rate in comparison to a customer's OAT.
  - An evaluation of the **cost recovery** which assesses the impact of any under-collection of revenues associated with the Pilot.

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3. Participant Summary (n=5)

ID	ASP	Start month	NEM / Type	CARE?	Rate	Class	Industry
ASP-A-001	ASP-A	Aug 23	Yes, 1.0	N/A	TOU-GS-2-R	Com.	Education
ASP-A-002	ASP-A	Aug 23	Yes, 1.0	N/A	TOU-GS-2-R	Com.	Education
ASP-B-001	ASP-B	Aug 23	Yes, 2.0	N/A	TOU-GS-2-D	Com.	Civic / Social Org.
ASP-C-001	ASP-C	Aug 23	No	No	TOUD-5-8PM	Res.	N/A
ASP-C-002	ASP-C	Jul 23	No	Yes	TOUD-5-8PM-CARE	Res.	N/A

- At the time of the report, 54 customers were at various stages of the Pilot nearing the settlement process

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4. Load Response Analysis
Methods

- Two types of analyses were conducted

- Comparisons of hourly usage by price day type
  - Compare usage on the highest-priced day (August 16th, which reached $1.74/kWh during HE17) to a similar day with lower dynamic prices (August 30th, when the price reached $0.58/kWh)
  - Provides an anecdotal illustration of whether/how customers respond to the highest dynamic prices

- Statistical analysis
  - Uses data from all of August 2023 to estimate the relationship between customer usage and hourly dynamic prices
  - Control for typical hourly usage pattern, temperature, and day type (non-holiday weekday vs. weekends and holidays)
  - More comprehensive than the day-type analysis

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4. Load Response Analysis:
August Price Summary
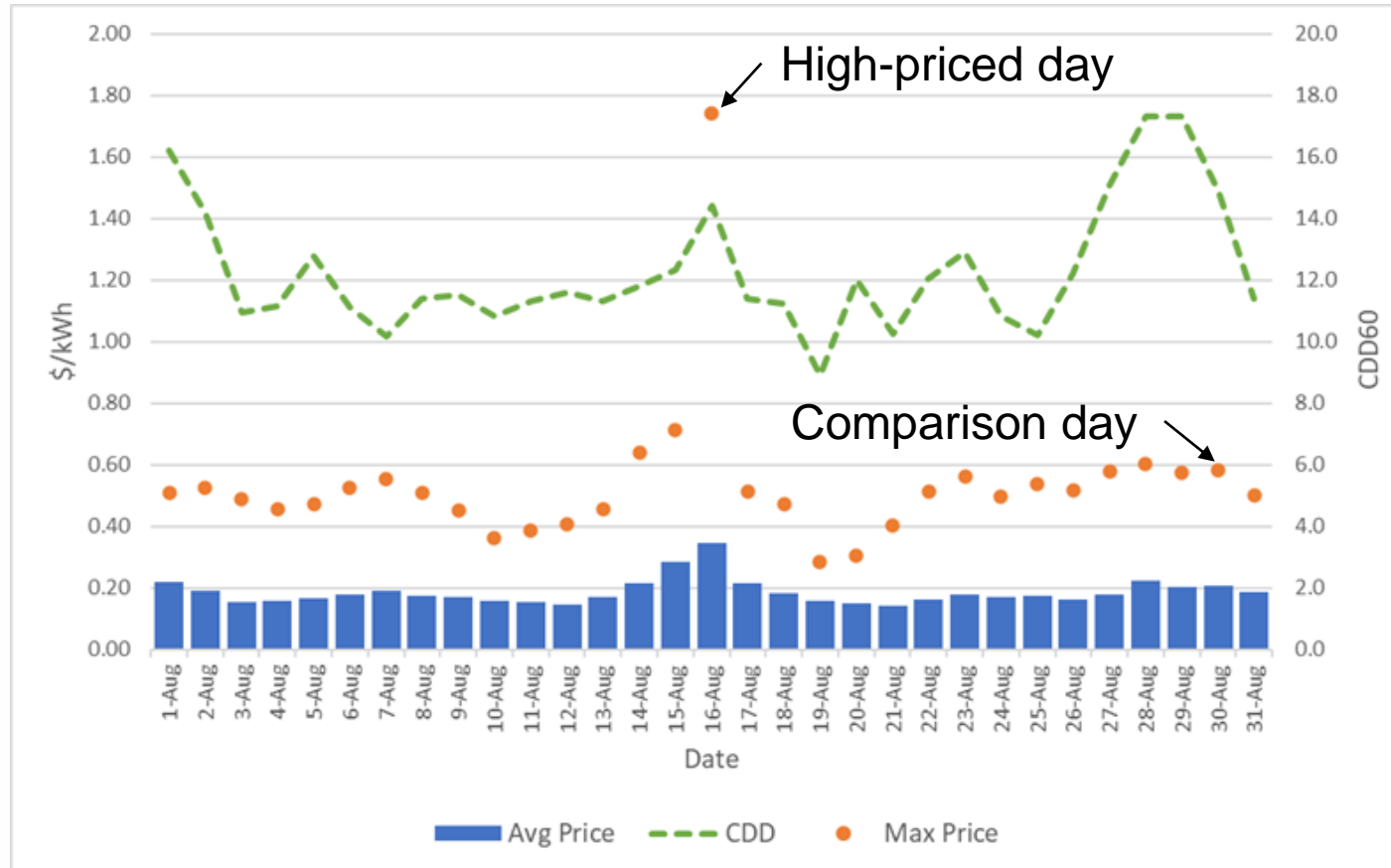
4. Load Response Analysis:
August 16th Hourly Prices

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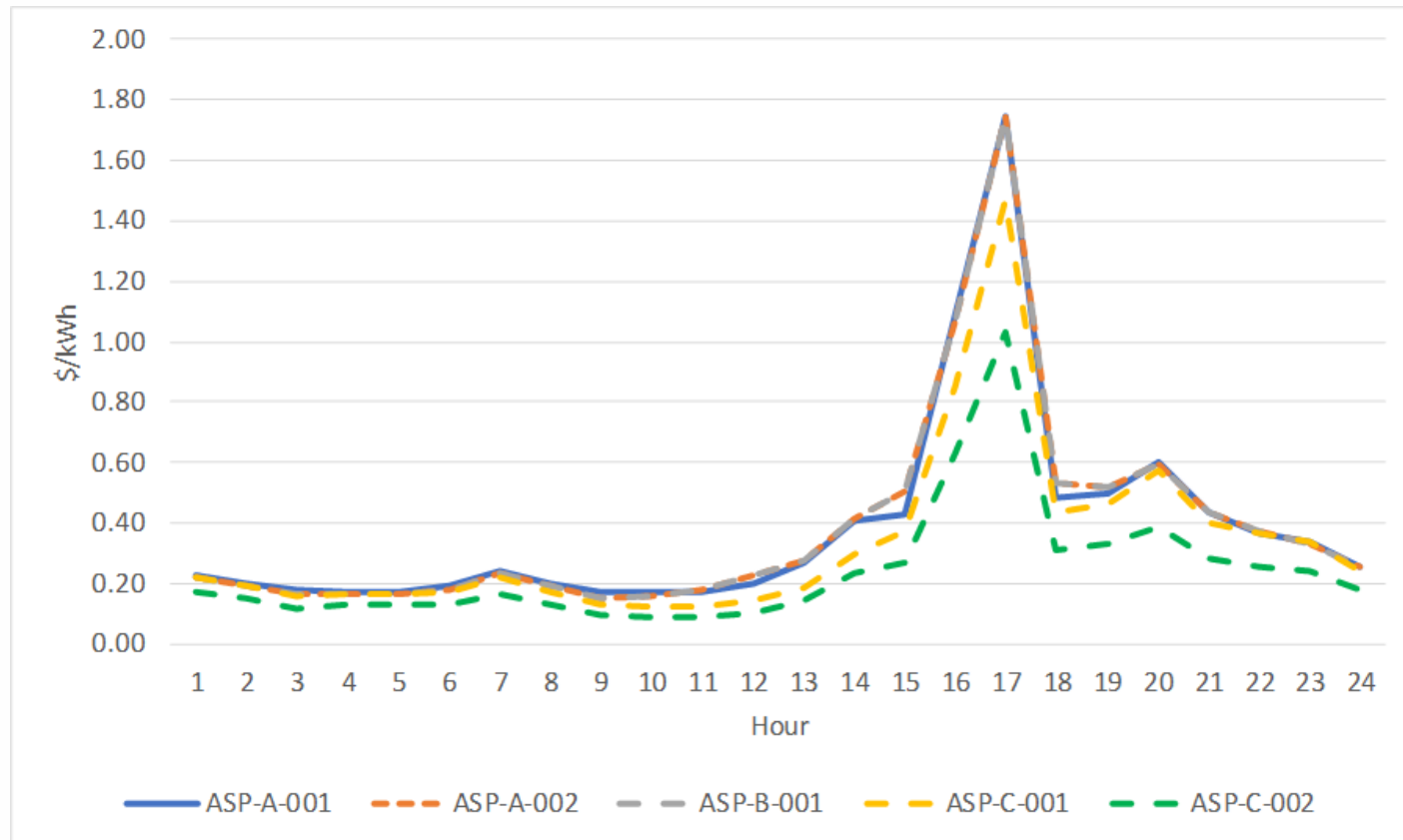
4. Load Response Analysis
Price day type comparison findings

- Figures can't be shown due to customer privacy & confidentiality concerns

- The figures provided little evidence that customers acted to avoid the August 16th price spike

- For example, one customer usage dropped during the highest-priced hour on August 16th, but this drop also occurs on the low-priced day

- However, one customer had relatively low usage in hours-ending 19 and 20 across the whole month. Those hours tend to have the highest prices, so the observed loads may indicate that the customer avoided using electricity during those hours daily but did not respond differently based on date-specific prices.

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4. Load Response Analysis
Statistical analysis findings

- Examined within-pilot data for August 2023

- Three model versions tested:
  - Current usage vs. current price
  - One-hour differenced usage vs. one-hour differenced price
  - Two-hour differenced usage vs. two-hour differenced price

- The differenced models may better reflect how customers respond to price differences within a day (i.e., testing the extent to which the change in usage across hours within a day is related to the change in price within a day)

- Of the 15 estimated price variables (5 customers x 3 methods), only one was statistically significantly different from zero

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4. Load Response Analysis
Summary of findings

Several factors likely contributed to the lack of evidence for price responsiveness

- Lack of pilot experience available to examine (focused on one month for five customers)
- Weather was generally mild, with at least one customer rarely using the air conditioner that would be controlled to respond to price signals
- One customer expressed that they needed time to acclimate to, and be more informed about, the methods that would be used to respond to prices
- Two customers were part of a technology test process from their ASP that required them to revert to their pre-Pilot load management methods at pre-specified random intervals
- The month had only one period with significant price spikes, during hours-ending (HE) 16 and 17 of August 16th

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5. Bill Impact Analysis
Overview

- August 2023 bills were available for five customers; the July 2023 bill was available for one of them

- Both OAT and Pilot (shadow) bills were available
  - Shadow bills can further be divided into subscription and ex-post components
  - No participants engaged in day-ahead or hour-ahead transactions during the analysis period

- At the end of the relevant 12-month period, the customer will be credited for savings they would have realized under dynamic pricing rate, but they will not be billed for more if the OAT bills are lower than the Pilot bills.

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5. Bill Impact Analysis
Summary

- Tables cannot be shown due to confidentiality concerns
- Two of the five customers were on track to receive a bill credit given their Pilot experience through August 2023
- For the sole customer with two months on the Pilot, a bill credit in one month was more than offset by a higher shadow bill in the other month
- Subscription average prices do not necessarily match average OAT prices because the subscription is priced using historical usage patterns while the OAT is billed at current usage (i.e., the customer's load factor may have changed)

5. Bill Impact Analysis
Summary (2)

- When examining transactions data, we found:
  - Three of the five customers had a higher percentage of hours in which they sold excess subscription versus buying additional energy above the subscription amount
  - Ex-post transactions (buy and sell) had lower average prices than the corresponding subscription prices

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5. Bill Impact Analysis
Shadow Bill Credit Interpretation

- A customer who receives a shadow bill credit could still have paid more than their pre-Pilot costs, and a customer who does not receive a shadow bill credit may still have benefited from Pilot participation

- For example, a customer who increases its billed demand under the OAT but responds to dynamic prices may save money relative to the current OAT bill, but pay more than they would have under the OAT had they not changed usage at all

- One of the ASPs responded to this Pilot credit design and considered both the dynamic and OAT prices when managing a customer's usage

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6. Cost Recovery Issues

- Comments during the proceeding in which the Pilot was approved reflected concern that the Pilot could shift costs to other service classes

- The available information (one month of data for five customers) is not adequate to assess this issue

- The design of the Pilot "two-part" rate design suggests that the Pilot may adequately recover the costs to serve the participants, thus limiting the potential of cost shifts to non-participating customers

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