

**DOCKETED**

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| <b>Document Title:</b>  | Presentation - CPUC - CalFUSE VGI Rates and ELRP                               |
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California Public  
Utilities Commission

# EV Specific Rates and CPUC Energy Division CalFUSE Staff Proposal

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Retail Rates Section | Energy Division

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# Summary

- **Multiple options to support Vehicle-Grid Integration**
  - I. Optional EV TOU rates with reduced demand charges or demand charge “subscriptions”.
  - II. EV RTP rate options and V2G Export compensation pilots
  - III. Emergency Load Reduction Program (ELRP)
  - IV. Submetering protocols
  - V. “CalFUSE” CPUC Energy Division Staff proposal

# I. EV TOU Rates

- **SCE Charge Ready Program (TOU-EV-7/8/9)**

- No monthly demand charges till 2023, 5-year phase in afterwards
- E.g., TOU-EV-8 off-peak = \$0.176/kWh (summer), \$0.108/kWh (winter)

- **PG&E Schedule BEV**

- Super off-peak (9am-2pm) = \$0.1485/kWh
- Discounted “Subscription”-based demand charges: e.g., \$62/mo for 50-kW

- **SDG&E EVHP**

- Super off-peak (12am-6am) = \$0.10/kWh
- “Subscription”-demand charge: e.g., \$190/mo for 50-kW

## II. EV Dynamic Rate Pilots

- **PG&E Commercial EV Day Ahead RTP (CEV DAHRTP) rate (D.21-11-017) – October 2023**
  - Optional day-ahead, hourly RTP rate for Commercial EV customers.
  - Includes a dynamic MGCC Adder and a time-differentiated Revenue Neutral Adder
  - Distribution rate includes demand charge-“Subscription”
  - Cost-based export rate-rider (in proceeding: A.20-10-011)
- **SDG&E GRC Phase 2 RTP rate & High-Power EV(HPEV) RTP Rate (A.21-12.006/A.21-12.008)**
  - Applications for C&I RTP pilot and RTP export rate-rider for HPEV customers have been consolidated into a single proceeding.
  - Rate design includes day-ahead hourly market prices, CPP adders for MGCC.
  - SDG&E to revise its applications in supplemental testimony based on ED staff guidelines.

**Note: Both the above pilots offer dynamic generation rates and do not include dynamic distribution rates.**

- **SB 676 PG&E VGI Pilots (CPUC Resolution E-5192 regarding PG&E AL 6259-E)**
  - 3 VGI pilots (residential, commercial fleet, and microgrid)
  - Address V2X barriers and demonstrate capabilities of bidirectional EV chargers

# III. ELRP Option A.5: VGI Aggregation

ELRP established in D.21-03-056

VGI-specific program modifications established in D.21-12-015

|  |   |
|--|---|
| Program availability:                        | May-October<br>Seven days a week; 4-9pm           |
| Event duration:                              | 1 hour min; 5 hour max                            |
| Annual dispatch limit:                       | Up to 60 hrs                                      |
| <b>IOU minimum VGI aggregation dispatch:</b> | <b>30 hours per season</b>                        |
| Consecutive day dispatches:                  | No constraints                                    |
| <b>Compensation rate:</b>                    | <b>\$2/kW of Incremental Load Reduction (ILR)</b> |



# VGI Event Triggers

- **CAISO-Declared System Events**

- Alert (day-ahead)
- Warning (day-of, several hours ahead)
- Emergency (day-of, 30-60 min ahead)

- **IOU Discretion**

- High Location Marginal Prices (CAISO energy market)
- Forecasted grid stress conditions
- To meet 30-hour minimum VGI aggregation dispatch per season

# VGI Aggregation (ELRP A.5) Eligibility

- **An eligible aggregator can manage a portfolio that combines any numbers of EVs and charging stations**
  - Both V1G and V2G (export with bi-directional charger) is allowed
- **Eligibility Requirements:**
  - A customer site within an aggregation cannot be simultaneous enrolled in a supply-side (CAISO market-integrated) DR program.
  - All sites within the VGI aggregation must be located within the distribution service area of a single IOU.
  - A VGI aggregation should contribute ILR > 25kW for a minimum of one hour during an ELRP event
  - NOTE: NEM customers with EVs meeting the above requirements are eligible
- **An EVSE meter or EVSE sub-meter may be used to determine the ILR**



# IV. Submetering Protocols

- **PD adopting EV submetering protocol and EVSE communication protocols issued (June 20<sup>th</sup>) in R.18-12-006**
- **Goals:**
  - Reduce cost of EV charging
  - Consumers can avoid having to install a separate utility meter
  - Can use a submeter to have EV charging measured and billed separately
  - Customers can enroll in EV-specific rate independently



## V. The “CalFUSE” Staff Proposal

# Executive Summary

## Staff Proposal

Pursue joint reforms of DR programs and Rate structures to Promote *Unified Strategies* for Demand Management and Grid Optimization to ***Achieve widespread adoption of demand flexibility solutions.***

## Policy Objective: Improve demand-side resource management...

- Through more effective demand response (DR) and retail rate structures,
- That leverage opportunities enabled by long term electrification and DER deployment,
- To better address grid issues associated with the growth of renewables, electrification, and DER adoption, and support California's clean energy goals.



# Present

# Future

## Basket of Rates

(cost recovery / allocation, equity)

## Basket of Supply-Side Programs

(market integrated)

## Distribution Level DR

## Demand Side: Flexible Unified Signal for Energy in California (CaIFUSE)

- ➔ Complex, inefficient, expensive, confusing
- ➔ Difficult to scale, Limited adoption
- ➔ High cost of controls, automation

- ➔ Reduced complexity, Single point focus
- ➔ Highly scalable, widespread adoption
- ➔ Reduced cost of controls, automation

# The “CalFUSE” Vision



...leading to a reduction in peak loads, energy prices, and required infrastructure...



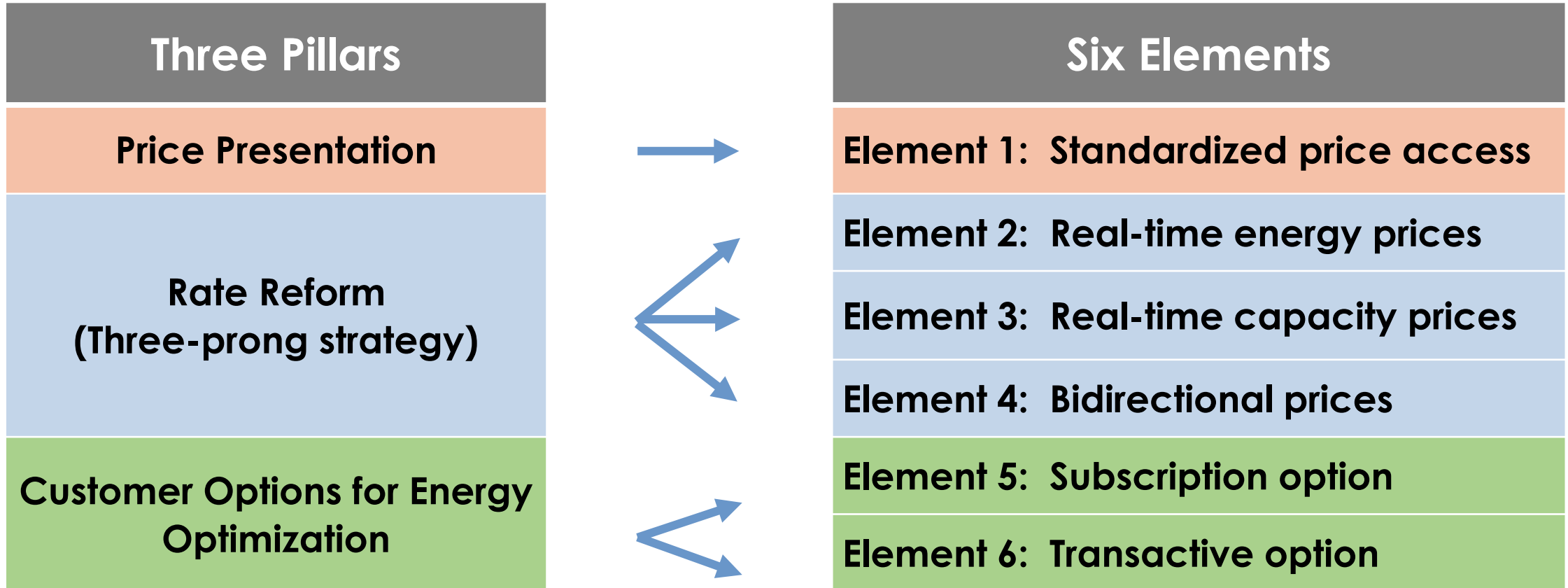
Lower peak load means less infrastructure cost..

...and customers buy more electricity when it is cheaper



- ➔ *Widespread adoption of demand flexibility solutions*
- ➔ Reduced peak loads, energy prices, infrastructure needs
- ➔ Reduced cost of service

# The CalFUSE “Framework”





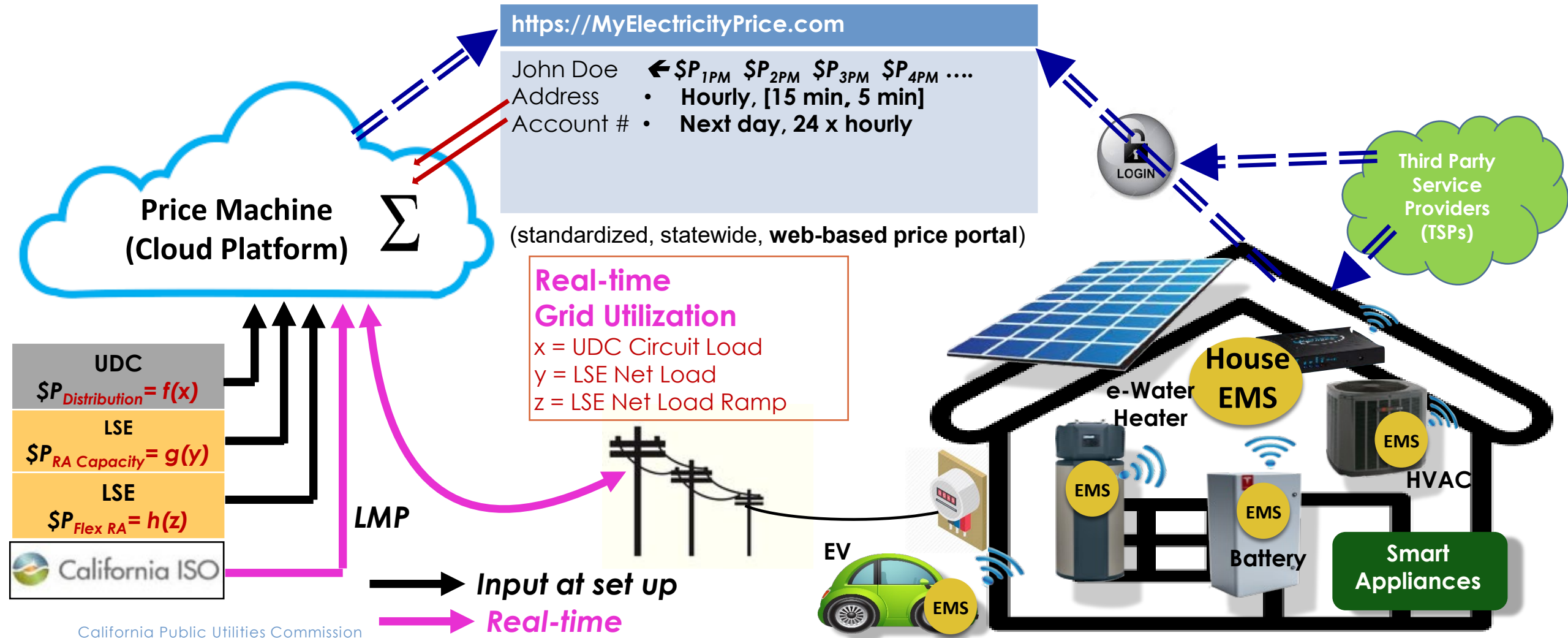
# Role of Third Parties

Third parties expected to play a major role in the implementation of CalFUSE.

The CalFUSE “ecosystem” could include:

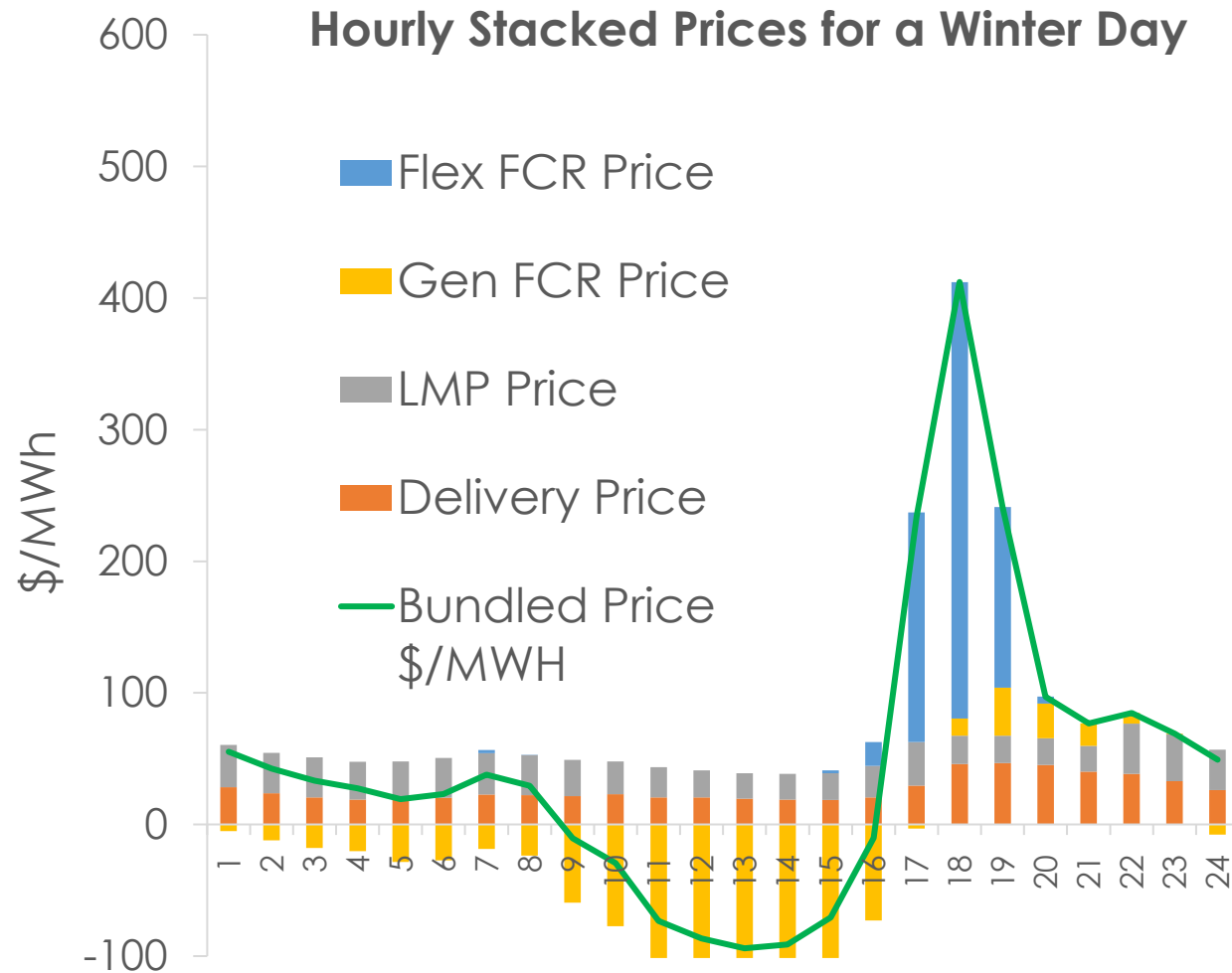
- **Application developers** focused on making the CalFUSE price signal accessible to customers and devices,
- **Device manufacturers** integrating the necessary functionality to enable the devices to interact with the CalFUSE signal,
- **Automation service providers** layering intelligent algorithms or artificial intelligence to optimize device behavior in response to the CalFUSE signal,
- **Energy management service providers** offering services to customers for managing multiple smart devices and optimize customer’s bills, and
- **DER operators or aggregators** pooling together and leveraging multiple customers and their devices as a resource and offering services to LSEs or UDCs, etc.

# Locational, Dynamic Energy and Capacity Prices



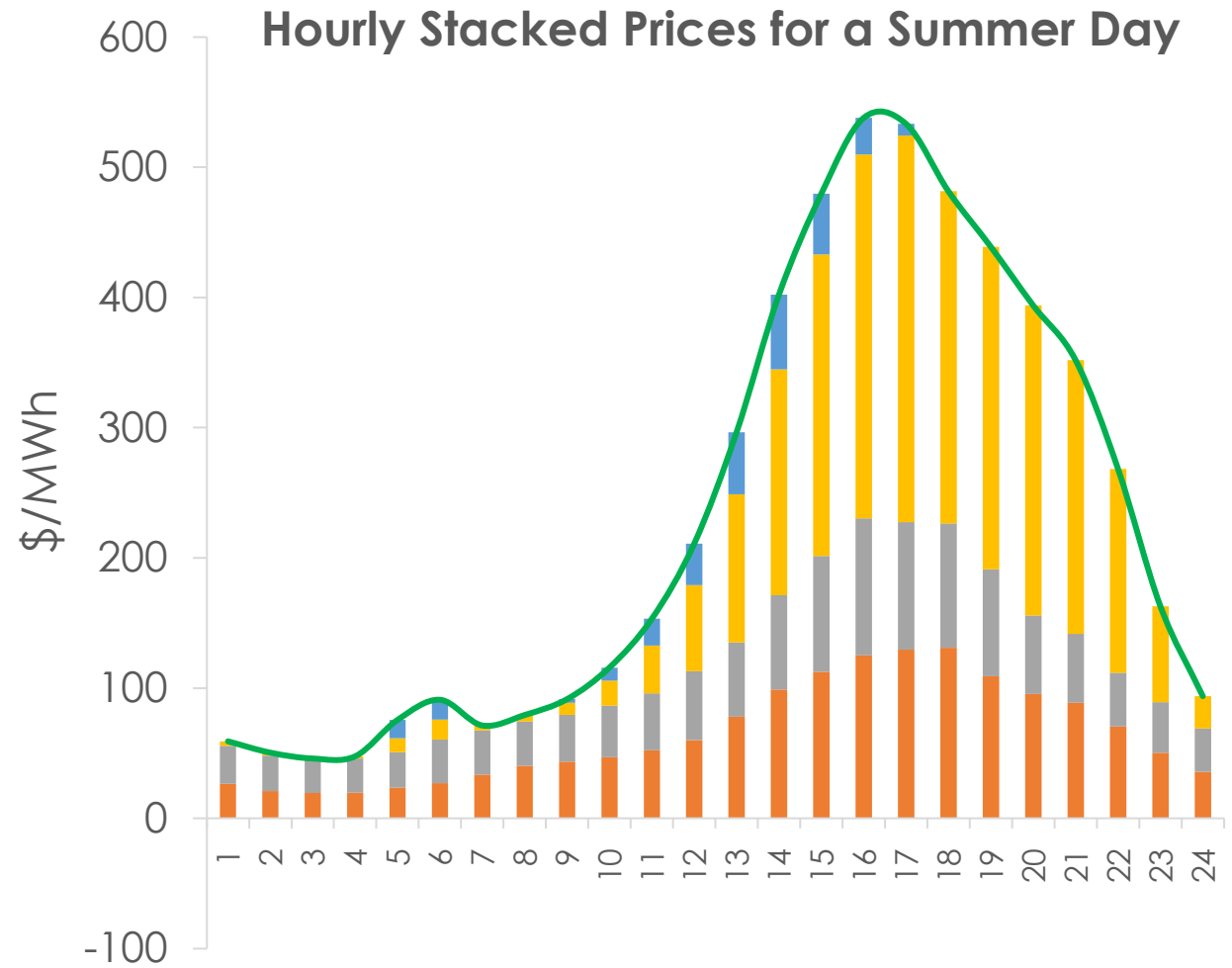
# Example – SCE/TeMix “RATES” Pilot

Composite Hourly Prices based on Hourly Capacity Utilization & CAISO LMP



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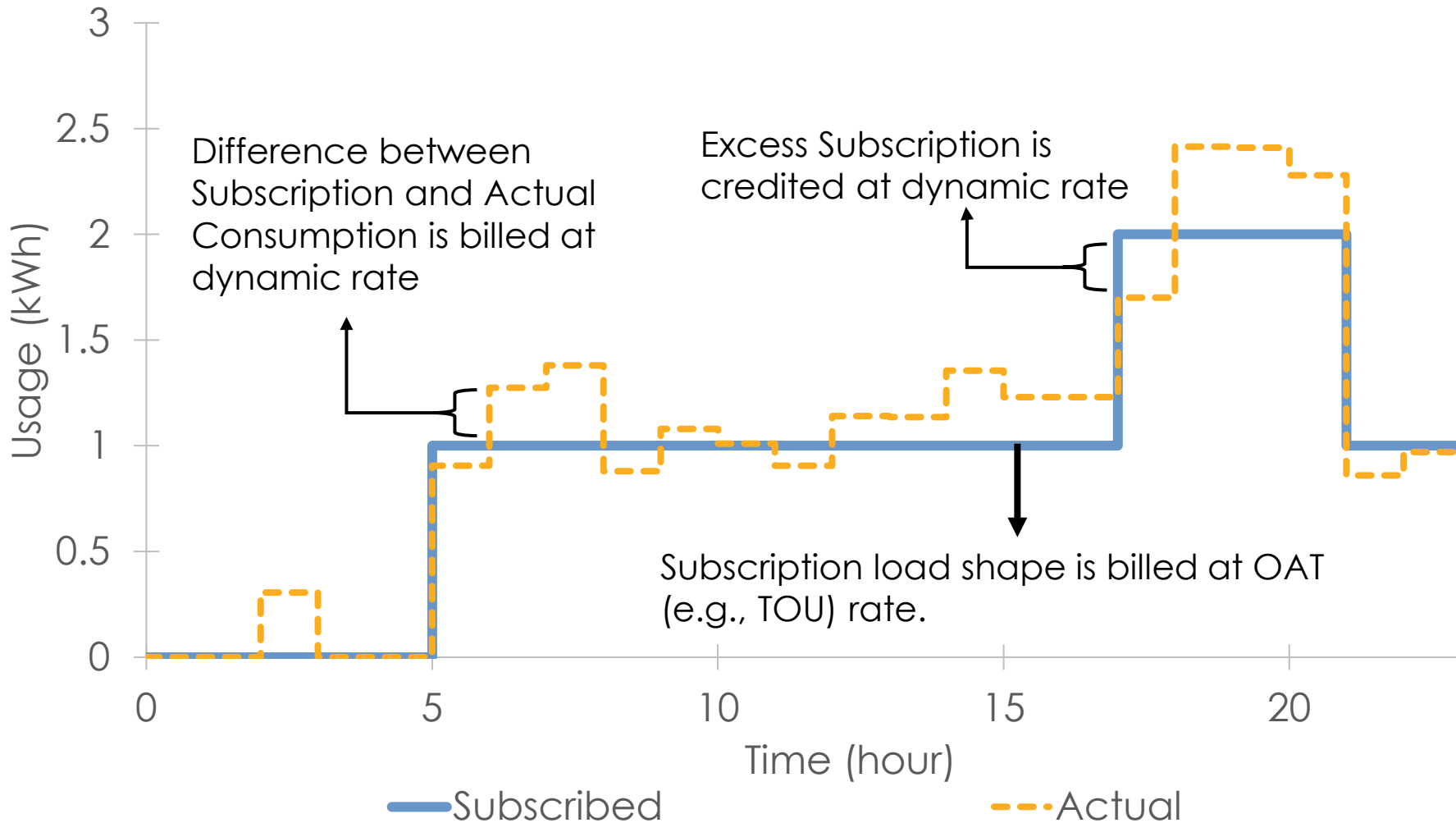
FCR = Fixed Cost Recovery



Source: SCE / TeMix “RATES” Pilot funded by CEC (EPIC)

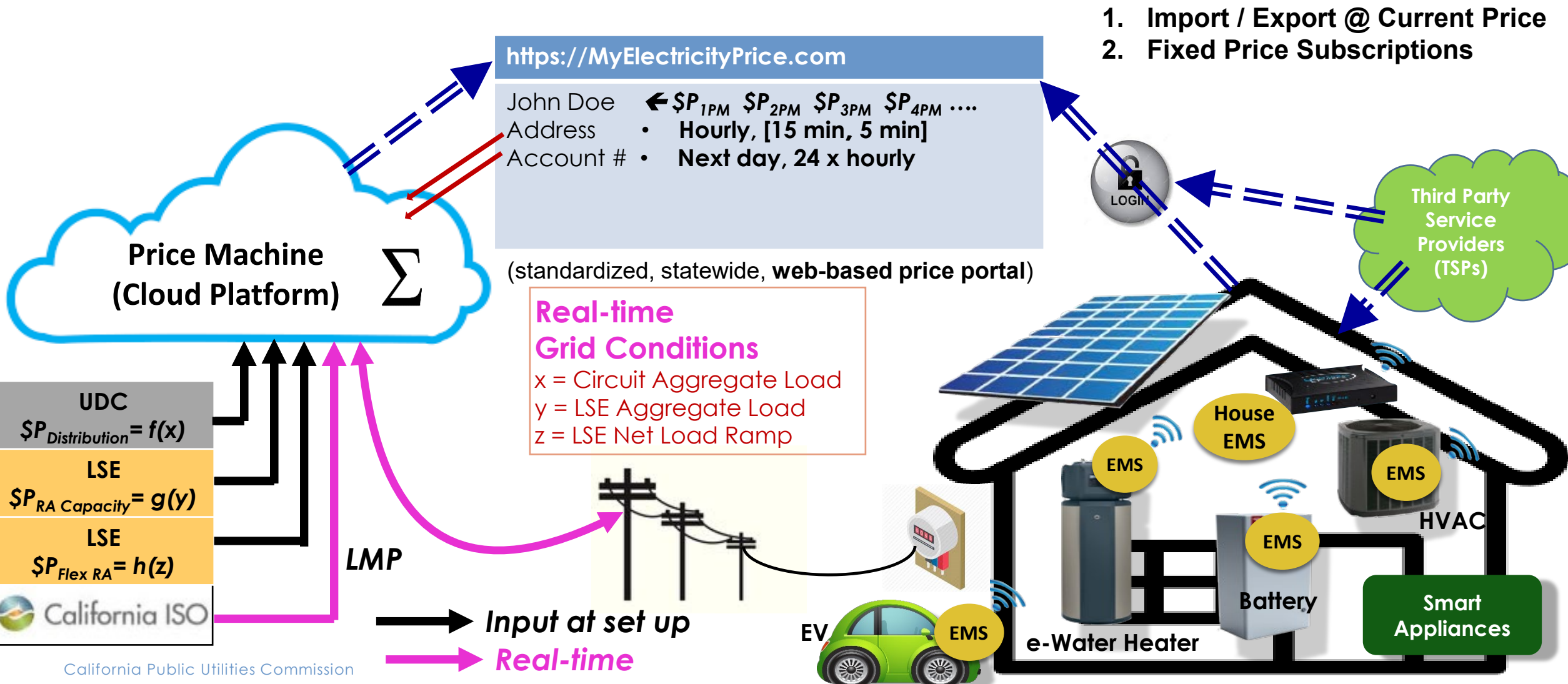
# Customer-Specific Baseline Subscriptions

## Historic Load Shape & Energy Quantity at OAT Price

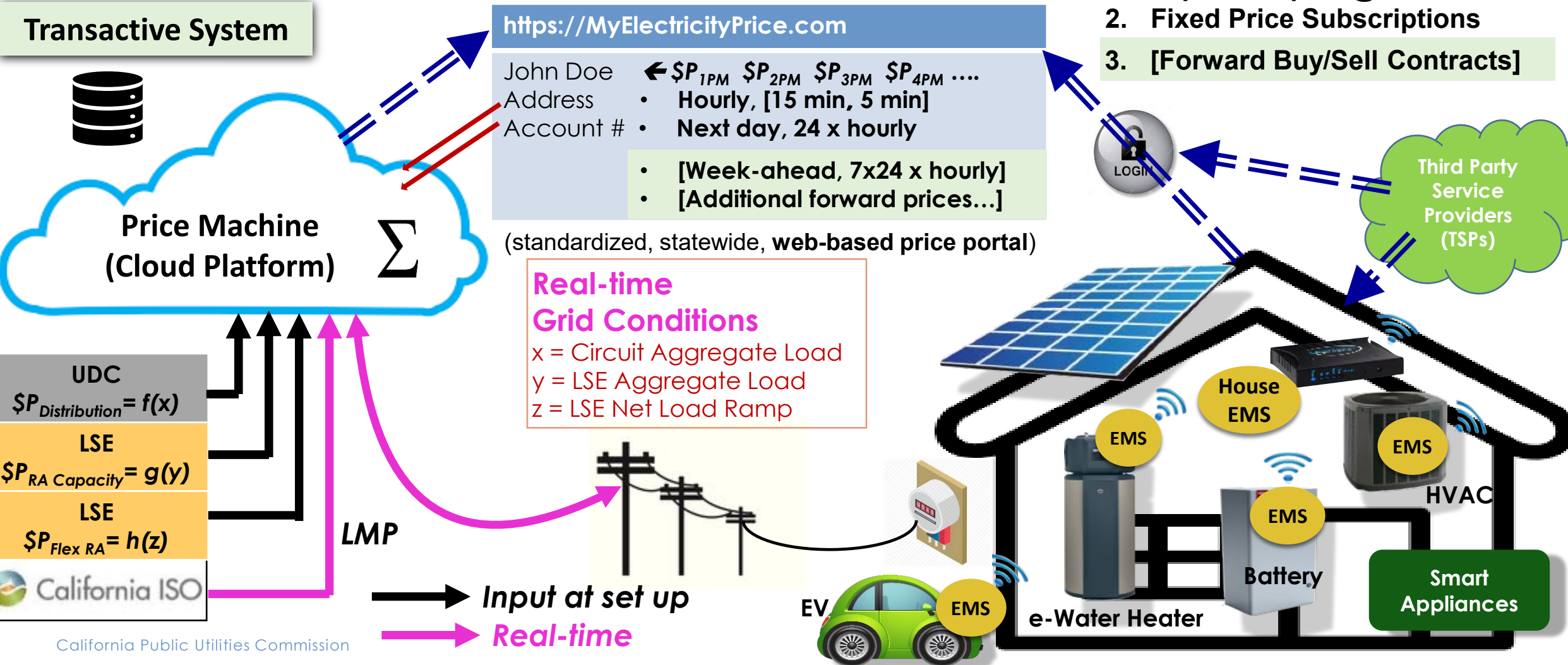


- Stabilizing Element (Hedge) for Both Customers and Utilities
- Options for subscriptions shape include:
  - Customer-specific,
  - class-averaged,
  - climate-zone weighted.

# Transactive Platform



# Transactive Platform





# Upcoming CalFUSE Pilots

- **CalFUSE Pilots authorized by Summer Reliability OIR Phase 2 (D.21.12.05) to launch on May 1**
- **VCE/PG&E “AgFIT” agricultural pumping dynamic rate pilot**
  - Jointly implemented by Polaris, TeMix, VCE, and PG&E
  - Authorized for 5MW (~1MW enrolled)
  - Provides farmers week-ahead prices which they can use to pre-schedule irrigation cycles using TeMix Transactive Layer
- **SCE “RATES Phase 2” dynamic rate pilot**
  - Open to all C&I and residential SCE customers
  - Will be available across SCE service territory



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