California’s Electric Grid Challenges

System trends by 2030:
• 60% increase in evening ramp
• 15x increase in renewables curtailment

CA is facing increasing reliability and stability challenges, both in terms of resource management and IOU revenue stability

Solutions:
• DR can be a cost-effective alternative
• But highly scalable, low-cost deployment strategies are needed

Graphic from CAISO “Briefing on Post 2020 Grid Operational Outlook,” Mark Rothleder, VP, @ CAISO BOG, December 19, 2019
The “UNIDE” Proposal
Executive Summary

**Vision:** A staff white paper and rulemaking that leverages a menu of opt-in and opt-out advanced rates and DR strategies to effectuate widespread load management, and a more robust, dynamic, transactive DER marketplace.

Support long term electrification:
- Leverage more effective DR and retail rate design strategies

Support and accelerate California’s clean energy goals:
- Better address grid issues associated with the growth of renewables, electrification, and DER adoption

Promote fair and secure compensation for DERs:
- Encourage mechanisms and automation technologies in an increasingly transactive bidirectional grid
Present

Basket of Rates
(cost recovery / allocation, equity)

Basket of Supply-Side Programs
(market integrated)

Distribution Level DR

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

Future

Demand Side: Unified, universal, dynamic, economic signal (UNIDE)

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

California Public Utilities Commission
The UNIDE Framework

1: Develop standardized, universal access to current electricity price
2: Introduce dynamic prices based on real-time, wholesale energy cost *(opt-in)*
3: Modify prices per real-time, localized grid conditions *(opt-in)*
4: Transition to bi-directional prices (buy & sell)
5: Offer subscription option (average load shape & energy quantity)
6: Introduce transactive features (ability to lock in price in advance)

Demand Side: unified, universal, dynamic, economic signal *(UNIDE)*
...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
Example: SCE/TeMix “RATES” Pilot
Composite Hourly Prices based on Hourly Capacity Utilization & CAISO LMP

Hourly Stacked Prices for a Winter Day
- Flex FCR Price
- Gen FCR Price
- LMP Price
- Delivery Price
- Bundled Price

Hourly Stacked Prices for a Summer Day

Source: SCE / TeMix Pilot funded by CEC (EPIC)
Subscriptions: Load Shape & Energy Quantity at Fixed Monthly Price
Stabilizing Element for Both Consumers and Utilities

Difference between Subscription and Actual Consumption is billed at RTP rate
Excess Subscription is credited at RTP rate
Subscription load shape is billed at TOU rate
Next Steps:
Upcoming Dynamic Rates Pilots

• RTP pilots have been authorized or in proceedings for all IOUs:
  • PG&E – Commercial EV Day Ahead RTP rate (authorized)
  • PG&E – GRC Phase 2 RTP rate (in proceeding)
  • SDG&E – GRC Phase 2 RTP rate (in proceeding)
  • SCE – GRC Phase 2 RTP rate (in proceeding)

• UNIDE pilots authorized by Summer Reliability OIR Phase 2 Decision
  • Valley Clean Energy and PG&E – Agricultural Pumping Dynamic Rate Pilot
  • SCE – RATES Phase 2 Pilot
Next Steps

- Finalize CPUC Energy Division Staff Proposal & Initiate Potential OIR (April/May 2022)