Time-of-Use Pilot Customer Insights*

Southern California Edison

Prapti Gautam, PhD
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*Supported by
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Purpose of this session

• SCE Opt in Pilot TOU Rates ***
• Load and Bill impacts
• Operational learnings
• Key Takeaways

***Opt-in TOU rates were tested – and a modified version of these rates are being rolled out for SCE’s Default TOU Pilot
TOU Opt-in Pilot Rates Overview
### Figure 4.1-1: SCE Pilot Rate 1 (January 2017)

| Tariff   | Season   | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24:00 |
|----------|----------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weekday  | Summer   |      |      |      |      |      |      |      |      |      | Super Off-Peak (23.2¢) | Off-Peak (27.8¢) | Peak (34.8¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|          | Winter   |      |      |      |      |      |      |      |      |      | Super Off-Peak (22.7¢) | Off-Peak (22.7¢) | Peak (27.3¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Weekend  | Summer   |      |      |      |      |      |      |      |      |      | Super Off-Peak (23.2¢) | Off-Peak (27.8¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|          | Winter   |      |      |      |      |      |      |      |      |      | Super Off-Peak (22.7¢) | Off-Peak (22.7¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |

### Figure 4.1-2: SCE Pilot Rate 2 (January 2017)

| Tariff   | Season   | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24:00 |
|----------|----------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weekday  | Summer   |      |      |      |      |      |      |      |      |      | Super Off-Peak (17.6¢) | Off-Peak (29.1¢) | Peak (55.2¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|          | Winter   |      |      |      |      |      |      |      |      |      | Super Off-Peak (17.7¢) | Off-Peak (25.5¢) | Peak (27.0¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Weekend  | Summer   |      |      |      |      |      |      |      |      |      | Super Off-Peak (17.6¢) | Off-Peak (29.1¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|          | Winter   |      |      |      |      |      |      |      |      |      | Super Off-Peak (17.7¢) | Off-Peak (25.5¢) |      |      |      |      |      |      |      |      |      |      |      |      |      |

### Figure 4.1-3: SCE Pilot Rate 3 (January 2017)

| Tariff   | Season   | 1:00 | 2:00 | 3:00 | 4:00 | 5:00 | 6:00 | 7:00 | 8:00 | 9:00 | 10:00 | 11:00 | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 | 24:00 |
|----------|----------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Weekday  | Summer   |      |      |      |      |      |      |      |      |      | Off Peak (16.3¢) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|          | Winter   |      |      |      |      |      |      |      |      |      | Off Peak (18.3¢) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|          | Spring   |      |      |      |      |      |      |      |      |      | Off Peak (18.3¢) |       | Super Off Peak (10.0¢) |       |       |       |       |       |       |       |       |       |       |       |       |
| Weekend  | Summer   |      |      |      |      |      |      |      |      |      | Off Peak (16.3¢) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|          | Winter   |      |      |      |      |      |      |      |      |      | Off Peak (18.3¢) |       | Super Off Peak (10.39¢) | Mid Peak (21.1¢) |       |       |       |       |       |       |       |       |       |       |       |
|          | Spring   |      |      |      |      |      |      |      |      |      | Off Peak (18.3¢) |       | Super Off Peak (10.0¢) | Mid Peak (21.1¢) |       |       |       |       |       |       |       |       |       |       |       |

Energy for What’s Ahead™
Study overview
Opt in pilot study design

• Randomized encouragement design

• RCT design where participants were first recruited into the study and then randomized into control or treatment

• Over-represented participation for mandated income categories (CARE/ FERA enrollment, income level guidelines, hot climate zones)

• ~50,000 customers enrolled

• After enrollment, response rates averaged 80% for SCE, 82% overall.

Opt in pilot study design & timeline

• Impacts on peak load and bills examined through meter interval data and monthly bills by Nexant, Inc.

• Impacts on health and economic ability examined through 2 surveys to customers: administered by Research Into Action, Inc.

• First customer bills: June-July 2016

• First Interim Report : April 2017
• Second Interim Report : Nov 2017

• Final Report : March 2018
Load impacts from Opt in TOU rates
Findings

• A difference in difference fixed effects regression using pre-treatment and post-treatment design

• Customers shifted load by varying amounts
  • Customers on TOU rates were more likely to take time-specific actions than customers in the OAT. E.g., a larger proportion of treatment customers indicated they shifted doing laundry, running the dishwasher, and increased their thermostat during peak hours.

• Absolute Peak Impact (0.06KW)

• Percent Impact (~ 3.2 - 4.4%)

• Most rates and customer segments showed a small conservation effect

• Similar peak reductions between Non CARE/FERA and CARE/FERA customers

1 Otherwise applicable tariff
Bill Impacts
Findings

• Load shifting / behavior partially mitigated some bill impacts
  (ranges: $2.21 – $3.37, 1.7- 2.7%)

• Some segments experienced high bills during the summer. Participants reported no increased difficulty in paying these bills, however, customer hardship is being examined for the full year.

Notes:

• First bill from TOU – Customers had no prior experience, and SoCal has hot summers

• Bill impacts were expected to be high

• Rates were seasonal *designed* to be higher in summer and lower in winter
Survey findings
Findings

• Economic index was measured through questions on difficulty paying bills and financial concerns about money.

• Medical health was indexed through self report.

• Customer satisfaction with SCE and Rates were also examined

• Overall, being on the TOU rates did not substantially increase economic hardship for CARE/FERA and CARE/FERA eligible customers.

• Being on the TOU rates also did not substantially increase economic hardship for seniors within households.
Operational Learnings
Operational findings

• Pretesting to help streamline the pilot process was successful
  • E.g. incentive amounts, use of FedEx envelopes.

• Streamlining of customer communications
  • Different customer departments as well as survey implementer needed to be in-sync

• In-language needs
  • Various languages were tested (Korean, Vietnamese, Mandarin & Spanish)- Spanish had the greatest need for our customer base.
Behavioral Insights
Key Takeaways

• Customers will shift behavior in response to TOU rates: we found both shifts in peak usage as well as overall conservation effects

• High differentials and longer peaks both had similar load peaks – high differentials might be preferable for effective behavioral measures

• Timing of TOU rates is important – starting on winter would be largely preferential compared with starting during the summer

• Adequate time to build in rates and finalize customer communication is important

• Utilizing a rigorously designed randomized controlled trial means that SCE and the CPUC has strong evidence based information that can be utilized for future program design and implementation.