PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Item 24
AGENDA ID #14673

ENERGY DIVISION **RESOLUTION E-4769 (Rev.1)**
March 17, 2016

R E S O L U T I O N

Resolution E-4769. Adoption of residential time-of-use pricing pilots pursuant to Decision 15-07-001.

PROPOSED OUTCOME:

- San Diego Gas & Electric Company's (SDG&E's) Time-of-Use (TOU) Pilot Plan advice letter is approved with modifications. SDG&E shall file a supplemental advice letter in compliance with this Resolution within 21 days.

SAFETY CONSIDERATIONS:

- There is no impact on safety.

ESTIMATED COST:

- The costs of SDG&E's TOU Pilots are estimated to be approximately $9 million.

By SDG&E Advice Letter (AL) 2835-E, filed December 30, 2015 and AL 2835-E-A, filed January 22, 2016.

SUMMARY

On December 30, 2015, San Diego Gas & Electric Company (SDG&E) filed its Time-of-Use (TOU) Pilot Plan advice letter in accordance with Decision (D.) 15-07-001 (the Decision) on 2015-2019 residential rate reform.[1] SDG&E filed a partial supplement to the advice letter on January 22, 2016.[2] The advice letter

[1] D.15-07-001 at 166; 303.

[2] All references hereafter to SDG&E's "advice letter" refer to supplemental Advice Letter 2835-E-A unless otherwise noted.

sets out SDG&E's plan for three residential opt-in TOU pilots that will inform their Rate Design Window (RDW) application on January 1, 2018 for a default residential TOU rate and a menu of optional TOU rates.

According to the final report of Nexant, Inc. to the TOU Working Group (the consultant report) that is incorporated by reference into SDG&E's original AL-2835-E, and SDG&E's AL 2835-E-A, SDG&E's TOU pilots will collect the following information:

- For SDG&E pilot rates 1 and 2, how TOU rates affect economically vulnerable customers and senior customers. The measured effects will include the bill impacts, an assessment of the behaviors underlying any shift or reduction in usage, and for economically vulnerable customers the load impact. These and other measured effects will be used to determine whether those customers would face unreasonable hardship if they were to be defaulted onto either pilot rate 1 or 2.
- The average peak and off-peak change in energy usage for SDG&E pilot rates 1 and 2 on a utility-wide scale, as well as in moderate and cool climate regions.[3]
- The average peak and off-peak change in energy usage for SDG&E pilot rates 1 and 2 for customers enrolled in the California Alternate Rates for Energy (CARE) program or the Family Electric Rate Assistance (FERA) program, and for non-CARE/FERA customers on a utility-wide scale.
- For SDG&E pilot rates 1 and 2, the bill impacts for CARE/FERA customers and non-CARE/FERA customers in SDG&E's moderate and cool climate regions, as well as the bill impacts for CARE/FERA customers in the hot climate region for pilot rate 2; and an assessment of the behaviors underlying any shift or reduction in usage.
- The level of customer understanding, acceptance, and engagement while taking service on a given TOU rate.

[3] SDG&E's advice letter at Attachment A, page 22 notes that it may be possible to calculate load impacts for the hot climate region as well if a matched control group is used, or if a normal control group is created in the event that more hot climate region customers enroll than expected.

- The impact of a usage alert on energy usage and/or customer understanding, acceptance, and engagement while taking service on SDG&E's pilot rate 2.
- The impact of education and outreach (E&O) materials that are tailored to various customer segments (including seniors, renters, and non-English speaking customers) and to certain cognitive profiles/customer personas on customer understanding, acceptance, and engagement while taking service on SDG&E's pilot rates 1 and 2.
- SDG&E's pilot rate 3 is specifically designed to test customer interest, acceptance and understanding of a relatively complex TOU rate that uses variable hourly pricing. SDG&E will also seek to assess the effectiveness of enabling technologies in conjunction with the variability of the pricing in pilot rate 3. Because pilot rate 3 is unique and complex, only 50 to 200 customers that are early adopters and that might benefit from the rate are targeted for enrollment.

This information must be collected in the evaluation and analysis of SDG&E's TOU pilots. A complete list of the deliverables can be found in the Deliverables Table below. SDG&E's advice letter also contains a request for authorization of TOU pilot study costs as required by the Decision.[4]

As discussed in detail below, SDG&E's advice letter, as modified herein, fulfills the requirements of the Decision and is expected to lead to the collection of the deliverables outlined in this Resolution, and is therefore approved, subject to modifications as ordered in this Resolution that must be made by a supplemental advice letter filed within 21 days.

BACKGROUND

Public Utilities (P.U.) Code § 745 establishes the conditions for implementing default TOU rates for residential electricity customers. The Decision established the pathway toward default TOU rates for all residential electricity customers of California's investor-owned utilities (IOUs) by January 1, 2019.

[4] D.15-07-001 at 166.

Section 745 sets out several conditions that must be met before the implementation of default TOU rates for residential customers in 2019. These include:

- Certain classes of customers may not be defaulted without their affirmative consent – customers with medical baseline allowances, customers requesting third-party notification, and customers that require an in-person visit prior to disconnection.[5]
- The California Public Utilities Commission (Commission or CPUC) must ensure that any TOU rate schedule does not cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones.[6]
- The CPUC must strive for TOU rates that utilize time periods for at least five years.[7]
- One year of bill protection must be provided to customers defaulted to TOU rates.[8]
- A comparison of various rate options and the impact on a customer's bill must be sent to each customer annually.[9]
- A non-TOU rate option must be available for customers to switch to if they choose.[10]
- The CPUC must explicitly consider evidence addressing the extent to which hardship will be caused on: 1) customers located in hot, inland areas, assuming no change in their usage during peak periods, and 2) residential customers living in areas with hot summer weather, as a

[5] P.U. Code § 745(c)(1).

[6] P.U. Code § 745(c)(2). Note that the CPUC will separately consider the definition of many of these terms in a Decision in Phase 3 of the R.12-06-013 proceeding.

[7] P.U. Code § 745(c)(3).

[8] P.U. Code § 745(c)(4).

[9] P.U. Code § 745(c)(5).

[10] P.U. Code § 745(c)(6).

result of seasonal bill volatility, assuming no change in summertime usage or in peak period usage.[11]

Many of these requirements can be met without the need for an opt-in TOU pilot (e.g., the requirement to transmit bill comparisons on an annual basis). In order to fulfill the requirements embodied in Section 745(c)(2), however, it is necessary to gather data on how seniors and economically vulnerable customers in hot climate zones respond to TOU rates.

The Decision also notes that parties suggested that the effectiveness of various education and outreach (E&O) strategies for customers on TOU rates be explored before the implementation of default TOU rates for residential customers in 2019.[12]

Additionally, we note that SDG&E was ordered through a Joint Assigned Commissioner's and Administrative Law Judge's Ruling (ACR or Ruling) of September 24, 2015 to "prepare a menu of a minimum of three opt-in [TOU] rate designs for piloting beginning in 2016. At least one of the opt-in TOU pilot rates for [SDG&E] must be a TOU option with a more complex combination of seasons and time periods than traditional TOU rates that better matches system needs, and must begin no later than October 1, 2016. The design of all opt-in pilots must be prepared in 2015 and submitted for Commission review and approval as part of the Tier 3 advice letters required to be filed by D.15-07-001 on January 1, 2016."[13]

On December 30, 2015, SD&GE filed AL 2835-E. Energy Division reviewed AL 2835-E and found the filing to be non-compliant, and therefore requested a supplement to correct deficiencies. On January 22, 2016, SDG&E filed supplemental AL 2835-E-A. In an Administrative Law Judge's Ruling of February 3, 2016, SDG&E's officer responsible for the original filing of AL 2835-E

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[11] P.U. Code § 745(d)(1)-(2). As with the Section 745(c)(2) terms, the CPUC will separately consider the definition of many of these terms in a Decision in Phase 3 of the R.12-06-013 proceeding.

[12] D.15-07-001 at 165.

[13] ACR at 1.

was called to appear before the Administrative Law Judge at a status conference on February 4, 2016, to explain the deficiencies of AL 2835-E. The CPUC's investigation of the filing of AL 2835-E is ongoing.

Per the Decision's instructions, the IOUs formed a TOU Working Group that met frequently through December, 2015. The TOU Working Group collectively selected a consultant to inform their work on TOU pilot design, and the consultant report is incorporated by reference in SDG&E's AL 2835-E. The consultant report heavily informed SDG&E's TOU Pilot Plan development, and we expect the TOU Working Group will remain extant to consider ongoing implementation issues related to the TOU pilots, development of the survey and measurement and evaluation (M&E) plan for the pilots, default TOU pilots for 2018,[14] and the preparation of the IOUs' 2018 RDW applications.

SDG&E's proposed TOU pilots include the following elements:

- Three TOU rates will be tested, with varying levels of complexity and price differentiation.
- SDG&E's pilot rates 1 and 2 utilize a five hour peak period (4-9pm). Rate 1 includes a super off-peak period (12-6am on weekdays and 12am-2pm on weekends/holidays) that pilot rate 2 lacks. Both rates 1 and 2 utilize a six month summer (May-October) and a six month winter (November-April).
- SDG&E's pilot rate 3 is an hourly dynamic rate that includes, as proposed, an approximately $40 monthly service fee, prices that vary hourly, dynamic rate components and net surplus energy credits.
- SDG&E proposes summer price differentials of approximately 1:1.9 for rate 1 and approximately 1:1.7 for rate 2. Price differentials for rate 3 will vary on a daily basis.
- For SDG&E's pilot rates 1 and 2, a control group will remain on the existing tiered rate structure without a time-differentiated element. This will allow evaluators to test the impact of the TOU rate on a customer's load, bill and acceptance.

[14] By a letter submitted on November 30, 2015, the IOUs requested that the submission of default TOU pilot designs be delayed until December 16, 2016. This request was accepted by email ruling of ALJ McKinney on December 23, 2015.

- Because of the very low number of SDG&E customers in its hot climate region, SDG&E will not use a formal control group for customers in that region and will only recruit hot climate region customers to pilot rate 2. SDG&E may employ statistical matching in the evaluation phase to create a control group for the hot climate region customers.
- Thousands of SDG&E customers will be recruited onto pilot rates 1 and 2, and the control rate. SDG&E will use a "pay-to-play" recruitment approach[15] that will help defend against biased samples.
- Pilot rates 1 and 2 will begin in June, 2016 and continue through December, 2017. Pilot rate 3 will begin in October, 2016.
- SDG&E will default a subset of pilot participants on pilot rate 2 to enroll in usage alerts providing information on the customer's usage and the impact of pilot rate 2 on their bill. SDG&E will test the impact of the usage alert on the customer's bill, acceptance and load shift.
- Pilot participants will be surveyed to determine their acceptance, understanding and engagement with their rate.

As noted previously, SDG&E proposes to collect information through various survey questions related to how customers interact with the piloted rates, including:

- How pilot rates 1 and 2 affect economically vulnerable customers and senior customers.
- The level of customer understanding, acceptance, and engagement while taking service on a given TOU rate.
- The impact of education and outreach (E&O) materials that are tailored to various customer segments and to certain cognitive profiles/customer personas on customer understanding, acceptance, and engagement while taking service on a given TOU rate.

[15] "Pay-to-play" refers to a financial incentive provided to participants before, during, and/or at the conclusion of the pilot to promote recruitment and to retain customers on the rate for the duration of the pilot.

NOTICE

Notice of the SDG&E AL 2835-E/A was made by publication in the CPUC's Daily Calendar. SDG&E states that their advice letter was distributed in accordance with General Order (GO) 96-B, and was also served on the R.12-06-013 service list.

PROTESTS

A protest to SDG&E's original AL 2835-E was filed by SolarCity Corporation (SolarCity) on January 13, 2016. SolarCity requested various modifications to SDG&E's Pilot Plan. The Office of Ratepayer Advocates (ORA) also filed a protest to SDG&E's original AL 2835-E on January 29, 2016. Because much of the content of ORA's protest concerns the supplemental AL 2835-E-A as well, we interpret ORA's protest as addressing both letters in total. SDG&E filed a reply to these protests on February 9, 2016. The Utility Consumers' Action Network (UCAN) filed a protest to SDG&E's supplemental AL 2835-E-A on February 10, 2016. SDG&E filed a separate reply to UCAN's protest on February 10, 2016. SolarCity filed a protest to SDG&E's supplemental AL 2835-E-A on February 11, 2016. Environmental Defense Fund (EDF) filed a protest to SDG&E's AL 2835-E on February 11, 2016. We presume that EDF actually meant to protest the supplemental AL 2835-E-A, and interpret EDF's protest in that manner.

SolarCity

SolarCity in its original protest argues that the TOU pilots only test a limited set of TOU periods and that this would bias the future default TOU rate toward those periods. Specifically, the pilots would not collect information on customer response to earlier peak periods, and SolarCity argues that this would essentially prejudice the outcome of R.15-12-012 (the TOU OIR). In addition, SolarCity argues that solar and storage customers should be allowed to participate in the pilot, and that information about how these customers respond to TOU rates should inform future TOU rate design. SolarCity also requests that any recruitment, marketing or outreach material fairly articulate the reasons for late shifted peak periods, without assigning blame to solar or distributed generation customers. Finally, SolarCity argued that customers currently taking service on a

discontinued TOU rate, which choose to participate in the pilots, be allowed to resume service on their former rate once the pilot is over.

SDG&E's in its reply notes that SolarCity was a member of the TOU Working Group and had an opportunity to persuade the TOU Working Group to adopt its recommendations. SDG&E states that SolarCity did not object to SDG&E's proposed rate designs during TOU Working Group meetings. SDG&E further argues that its proposed rate designs are consistent with the Decision in spite of SolarCity's protest.

In SolarCity's protest to the supplemental AL 2835-E-A, they focus their argument on pilot rate 3. They argue that the cost basis for the proposed $40/month fixed charge is uncertain, requires greater scrutiny and may have the effect of dampening the incentive to shift load from peak times. SolarCity also states that they would like to examine SDG&E's forecasted bill impacts and the methodology SDG&E will use to determine Critical Peak Pricing Days.

The Office of Ratepayer Advocates (ORA)

ORA's main argument is that SDG&E's proposed pilot rates do not comply with an objective to test potential default TOU rates for residential customers. They argue the SDG&E's pilot rate 3 cannot possibly become a default TOU rate and therefore should be rejected entirely. ORA also states that SDG&E should not be allowed to record the estimated costs associated with the implementation of pilot rate 3. ORA further argues that SDG&E's pilot rate 2 should have its off-peak to peak price differential lowered to 1:1.5.

SDG&E in its reply to ORA's protest cites language from the Decision and the ACR suggesting that TOU pilots may include rates not contemplated as default rates. SDG&E also notes that while pilot rate 3 may be similar to a recently approved rate in another proceeding, pilot rate 3 will be available to customers beyond those contemplated by the other dynamic rate.

UCAN

UCAN's protest centers on SDG&E's pilot rate 3. They echo ORA's arguments that as pilot rate 3 is unlikely to become a default residential TOU rate, and

because it is similar to an experimental rate recently approved in a different proceeding, it should be rejected as its implementation would be an inefficient use of SDG&E's resources. UCAN therefore asks that SDG&E's proposed recovery of pilot rate 3-related costs be denied unless the rate is substantially modified.

SDG&E in its reply to UCAN's protest cites language from the Decision and the ACR suggesting that TOU pilots may include rates not contemplated as default rates. SDG&E also notes that while pilot rate 3 may be similar to a recently approved rate in another proceeding, pilot rate 3 will be available to customers beyond those contemplated by the other dynamic rate.

EDF

EDF's protest is generally supportive of the SDG&E pilot plan and commends in particular the proposal for pilot rate 3. EDF states that it has concerns regarding the fixed charge proposal and the lack of a formal control group for pilot rate 3. On the fixed charge, they note that the $40/month charge would not comply with existing law concerning potential default residential TOU rates. EDF suggests several other methods of testing customer response to different kinds of fixed charges. EDF also argues that net energy metering (NEM) customers should be allowed to participate in the pilots, and that CARE/FERA customers should be allowed to participate in pilot rate 3. EDF further proposes altering the CARE/FERA subsidy in a way that preserves the complete price signal of a volumetric TOU rate.

Disposition of protests

The concerns raised by SolarCity's original protest are noted and addressed. While SolarCity criticizes elements of the TOU pilot design proposed by SDG&E and developed by the TOU Working Group, it is important to note that this group included SolarCity as a participant. The Decision contains few mandates for the TOU pilots, and provides no specific requirements, guidance or direction that would support the concerns with TOU pilot design or the changes recommended by SolarCity. We also note that almost all of SDG&E's pilot participants will be drawn from customers not currently on TOU rates, making SolarCity's final argument moot as to these customers.

It is possible that some of the participants on SDG&E's pilot rate 3 may be existing TOU customers. Rate 3 customers that were originally TOU customers will have the option of returning to a TOU rate at the end of the pilot. Potential pilot rate 3 customers will be alerted that the peak periods or rate structure for SDG&E's opt-in residential TOU rates may change while a customer is on pilot rate 3 and that their old TOU rate may no longer be available. This will ensure that existing TOU customers can make an informed choice about whether to stay on their existing TOU rate or join pilot rate 3.

For these reasons, SolarCity's original protest is rejected.

SolarCity's second protest raises an issue that we recognize and address later in this resolution. We agree that the cost basis for the proposed $40/month fixed charge for SDG&E's pilot rate 3 is uncertain and direct SDG&E to modify this fixed charge accordingly. With respect to SolarCity's other elements of its second protest, we believe that these are appropriate topics for discussion at the TOU Working Group before pilot rate 3 recruitment begins. We encourage SolarCity to raise these issues in that forum and seek SDG&E's feedback.

ORA's protest is rejected for reasons similar to our rejection of SolarCity's original protest. While ORA asserts that pilot rate 3 cannot become a default rate, it does not provide any rationale for why this Resolution cannot approve a pilot TOU rate that may not become a default rate. Further, while ORA "recommends focusing on examining potential candidates for default TOU rates for 2019"[16], we note that the vast majority of IOU pilot TOU rates are indeed potential default TOU rates.

ORA argues that pilot rate 3 should be rejected because a different CPUC proceeding is considering a proposed electric vehicle rate that is similar to SDG&E's proposed pilot rate 3. ORA claims that it would therefore be "inappropriate"[17] for the CPUC to approve pilot rate 3 in this Resolution. ORA does not explain why that is so, and cites to no portion of the Decision (or any

[16] ORA Protest at 3.

[17] ORA Protest at 4.

other Decision) supporting their argument. We note that these proposed pilot TOU rates are experimental in nature and not binding for future implementation.

ORA states that SDG&E should not be allowed to record costs related to implementation of pilot rate 3 in its Residential Rate Reform Memorandum Account (RRMA). As with ORA's previous arguments, ORA does not explain why the CPUC should do this. ORA notes that the RRMA is designed to record incremental costs associated with SDG&E's TOU pilot program. Because the costs estimated by SDG&E for implementation of its pilot rate 3 are associated with its TOU pilot program, and therefore eligible for recovery upon review in accordance with the Decision, we reject ORA's protest on this point. We note that the reasonableness of SDG&E's recorded costs will be evaluated in a future CPUC proceeding.

Finally, ORA argues that the price differential for SDG&E's pilot rate 2 be lowered to from 1:1.7 to 1:1.5. ORA cites to language from the Decision that suggests default TOU rates begin with "less volatile" rates with a transition to more cost-based price differentials later.[18] We reject ORA's protest on this point. TOU rates that have low volatility are not necessary distinct from TOU rates that are cost-based. Furthermore, there is no clear definition of what a cost-based TOU rate for SDG&E should look like, or of what a "less volatile" TOU rate for SDG&E might look like. ORA's suggestion of a 1:1.5 price differential reflects an apparently arbitrary choice concerning the appropriate price differential for a TOU rate, with no explanation as to why this is more appropriate than SDG&E's 1:1.7 proposal. In light of this uncertainty, we reject ORA's protest on this point. UCAN's protests are rejected for similar reasons. SDG&E is not required by the Decision or the ACR to propose only potential default TOU rates for its TOU pilot rates. Furthermore, the fact that a separate proceeding has approved a similar rate for a different kind of customer does not necessarily make SDG&E's proposed pilot rate 3 incompatible with either the Decision or the ACR.

[18] ORA Protest at 5, citing to D.15-07-001 at 136. We note that SDG&E in its reply agrees with ORA's position on revising the rate differential for pilot rate 2. Nonetheless, we examine the proposal for rate 2 as submitted in SDG&E's advice letter and assess that proposal on its compliance with the Decision and the ACR.

EDF's protest is noted. Many of EDF's proposals are appropriate for the TOU Working Group to consider as the pilots are implemented, and we encourage EDF to raise its proposals – such as a restructured CARE subsidy – in that forum. We agree with EDF's general point that the $40/month fixed charge proposal should be modified and direct SDG&E to do so in this resolution.

DISCUSSION

It is important to ensure that implementation of SDG&E's TOU pilots proceeds smoothly and in accordance with the terms of this Resolution. Per the ACR, the two less-complex TOU pilots must begin by June 1, 2016, and the more complex TOU pilot must begin by October 1, 2016.[19]

Required information

In order to meet our statutory obligation embodied in Section 745(c)(2), we find that we must consider three core pieces of information for seniors and economically vulnerable customers in SDG&E's hot climate region:

> 1) The average peak and off-peak change in energy usage as a result of the TOU rate.
>
> 2) The impact of the TOU rate on customer bills (i.e., the distribution of bill impacts for the class of customer).
>
> 3) The impact of the TOU rate on how these customers use energy and on these customers' choices regarding other household expenses.

Due to the relatively small number of customers in SDG&E's hot climate region (~ 16,000), it is not possible to collect this information for all three SDG&E pilot rates. Instead, only pilot rate 2 will be offered to seniors and economically vulnerable customers in SDG&E's hot climate region, and a formal control group will not be utilized. While this is less than ideal, it is an approach adopted by the TOU Working Group and appears to be a reasonable limitation in light of the small number of hot climate region customers.

[19] ACR Ordering Paragraphs 2 and 3.

The TOU Working Group process revealed the need for more information to be collected by the pilots in order for the CPUC to make an informed decision on the potential benefits and hardships faced by SDG&E's customers because of TOU rates. In light of the TOU Working Group's discussion, and to more fully comply with the Decision's requirement to analyze customer understanding, acceptance, and engagement while on TOU rates[20], it is necessary to secure the following additional information beyond the core requirements of Section 745:

1) The average peak and off-peak change in energy usage as a result of pilot rates 1 and 2 for customers in SDG&E's service territory, and in SDG&E's moderate and cool climate regions separately (and potentially the hot climate region).[21]
2) The average peak and off-peak change in energy usage for CARE/FERA customers and non-CARE/FERA customers across SDG&E's territory as a whole for pilot rates 1 and 2.
3) The impact of pilot rates 1 and 2 on the bills of CARE/FERA customers and non-CARE/FERA customers (i.e., the distribution of bill impacts) in SDG&E's entire territory and in the moderate and cool climate regions separately (and potentially the hot climate region).
4) The impact of pilot rates 1 and 2 on how customers in SDG&E's entire territory, and in the moderate and cool climate regions separately, change their energy usage and on these customers' choices regarding other household expenses.
5) The level of understanding, acceptance, and engagement while taking service on a given TOU rate among various customer groups.

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[20] D.15-07-001 at 129 ("Specifically, the IOUs should quickly and thoroughly evaluate all areas of transition to default TOU, including but not limited to: load shift and load reduction, customer acceptance, appropriate parameters of residential default TOU, customer classes who are not able to respond and should remain on tiered default rate, and measure of environmental and cost savings from load shift and load reduction").

[21] SDG&E's advice letter, Attachment A at 21 noted that the hot region is comprised of SDG&E's mountain and desert climate zones; the moderate region is comprised of SDG&E's inland climate zone; and the cool climate region is comprised of SDG&E's coastal climate zone.

6) The impact of usage alerts and/or other technology on energy usage and/or customer understanding, acceptance, and engagement while taking service on a given pilot rate.
7) The take rates of participants on pilot rates 1 and 2 for smart thermostats at two different rebate levels, and qualitative assessment of their usefulness to households that accept them. If possible, an estimate of the load impacts of smart thermostat usage.
8) The customer interest, acceptance and understanding of participants on pilot rate 3; the strategies customers use to respond to hourly prices; the strategies customers use to respond to an over-generation credit; and the effectiveness of enabling technologies in conjunction with pilot rate 3.
9) The impact of E&O materials that are tailored to various customer segments (including seniors, renters, and non-English speaking customers) and to certain cognitive profiles/customer personas on customer understanding, acceptance, and engagement while taking service on a TOU rate.

These constitute the deliverables that must be collected by SDG&E's TOU pilots, and are accounted for in either SDG&E's advice letter or the consultant report incorporated by reference. In the event that SDG&E believes that its TOU pilots will not be able to collect these deliverables, SDG&E is ordered to immediately notify the CPUC and the TOU Working Group and propose modifications to their TOU pilots that will ensure they collect these deliverables.

Variety within the menu of TOU pilot rates

Both the Decision[22] and the ACR[23] require that a menu of TOU rates be offered to customers to ensure that there is adequate opportunity for a variety of residential customers to select the TOU rate that best reflects their needs. It also requires research on customer acceptance and response to a variety of rate structures. Therefore it is necessary for the pilots to study not only possible default TOU rate structures but also to study the viability of more complex TOU rate structures and customer response to these more complex rate structures.

Two components of this menu approach are the number of seasons and the distribution and timing of peak/off-peaks hours for a given TOU rate. As noted previously, SDG&E proposes three different TOU rate structures. The proposed TOU period definitions conform to the Decision and the ACR and are therefore acceptable.

A third component of the menu approach is price. Some residential customers may be less sensitive to price than others, while other customers may be very sensitive to price and would therefore react more strongly to peak to off-peak price differentials. At the same time, customers will have differing abilities to shift load regardless of price. It is expected that this load shift will reduce overall utility costs to the benefit of all ratepayers and in accordance with the state's broad policy goals.[24] Thus, it is essential to study the impact of price on customers.

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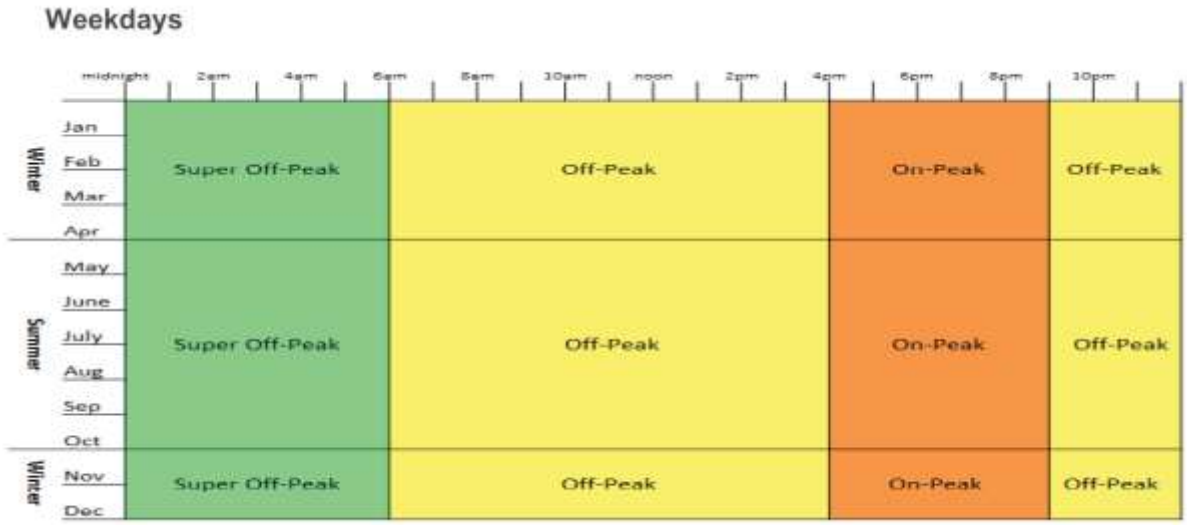
[22] D.15-07-001 at 134 ("Consistent with our statutory obligations pursuant to AB 327, it is important to remember that any default TOU rate derived from this decision will be optional and it is essential that the IOUs provide a menu of well-designed optional tariffs, including a tiered rate, for residential customers to opt into. Most parties in this proceeding have advocated this 'menu' of options, to promote customer choice,[citation] and we agree that a menu of choices for customers is part of the goal of this proceeding and AB 327").

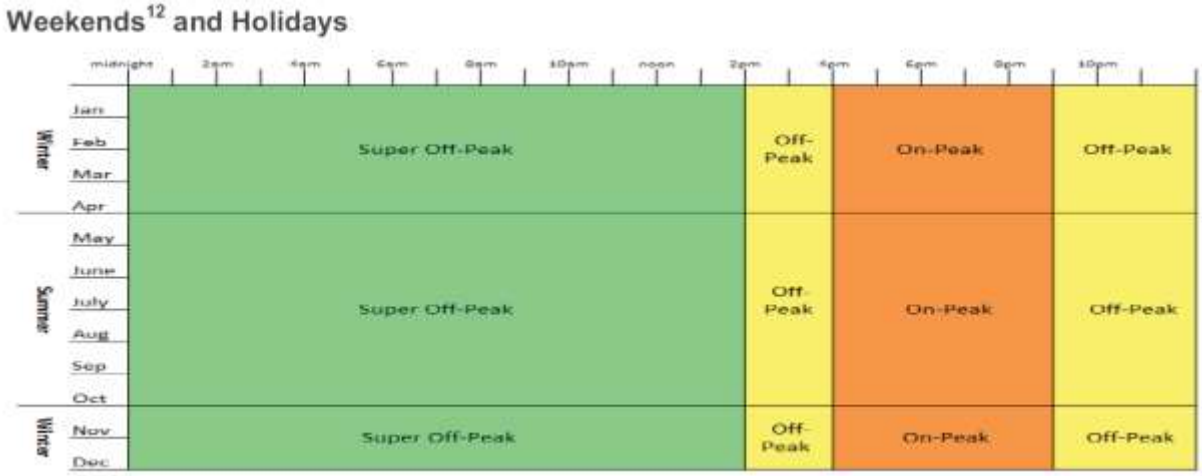
[23] ACR at 3 ("[I]t is necessary to develop and evaluate a variety of TOU rate designs that may either be used as a model for a default TOU rate in 2019, and/or as viable forward-looking pricing options that accommodate the changing conditions of the grid, fulfill California's long term energy policy objectives, and appeal to a variety of residential customers at that time").

[24] *See* D.15-07-001 at 143-144 ("TOU should be a flexible customer-empowering tool to make the load curve more manageable. As EDF describes it, using TOU to 'increase customers' ability to be an active part of the grid will be critical to ensuring that California achieves its emission reductions, renewables and other landmark clean energy policies'… A wide-scale TOU rate for residential customers must be flexible enough to account for load shifts from year to year, while

SDG&E's proposed rate design and pricing for pilot rates 1 and 2 appear below.

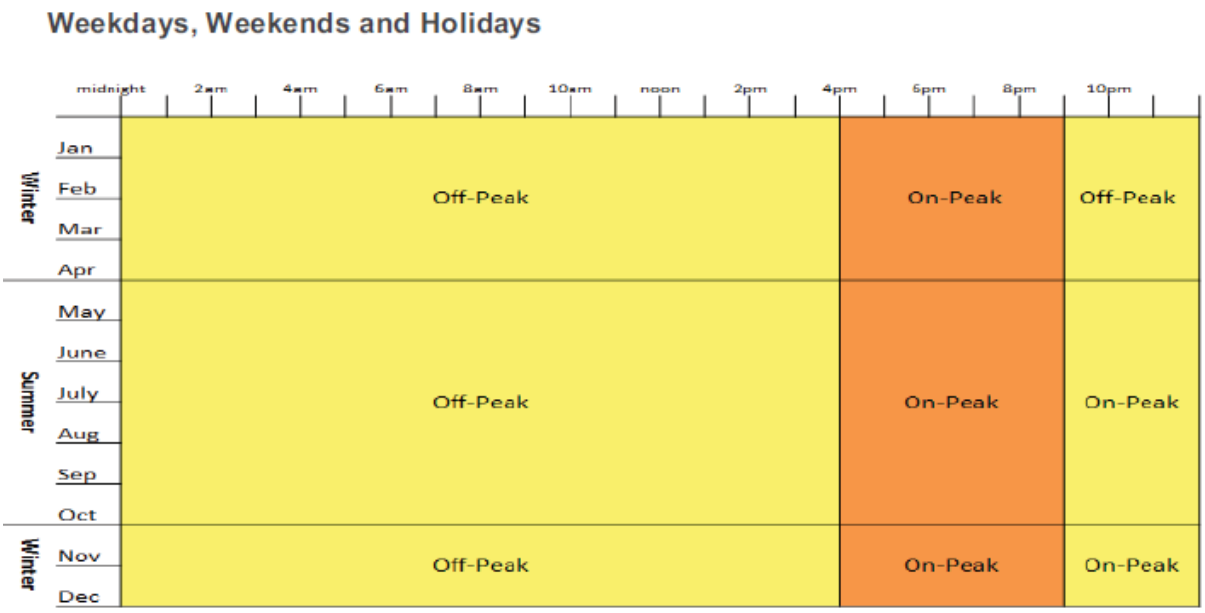
Rate 1 Period Definitions





providing customers with certainty required by AB 327. This can be accomplished through the menu of rate options proposed by many parties… Options for design of TOU rates that must be considered going forward include… tranches of optional TOU rates with complementary TOU periods that considered together address grid needs, but do not impose unreasonable hardship on individual customers").

Rate 2 Period Definitions



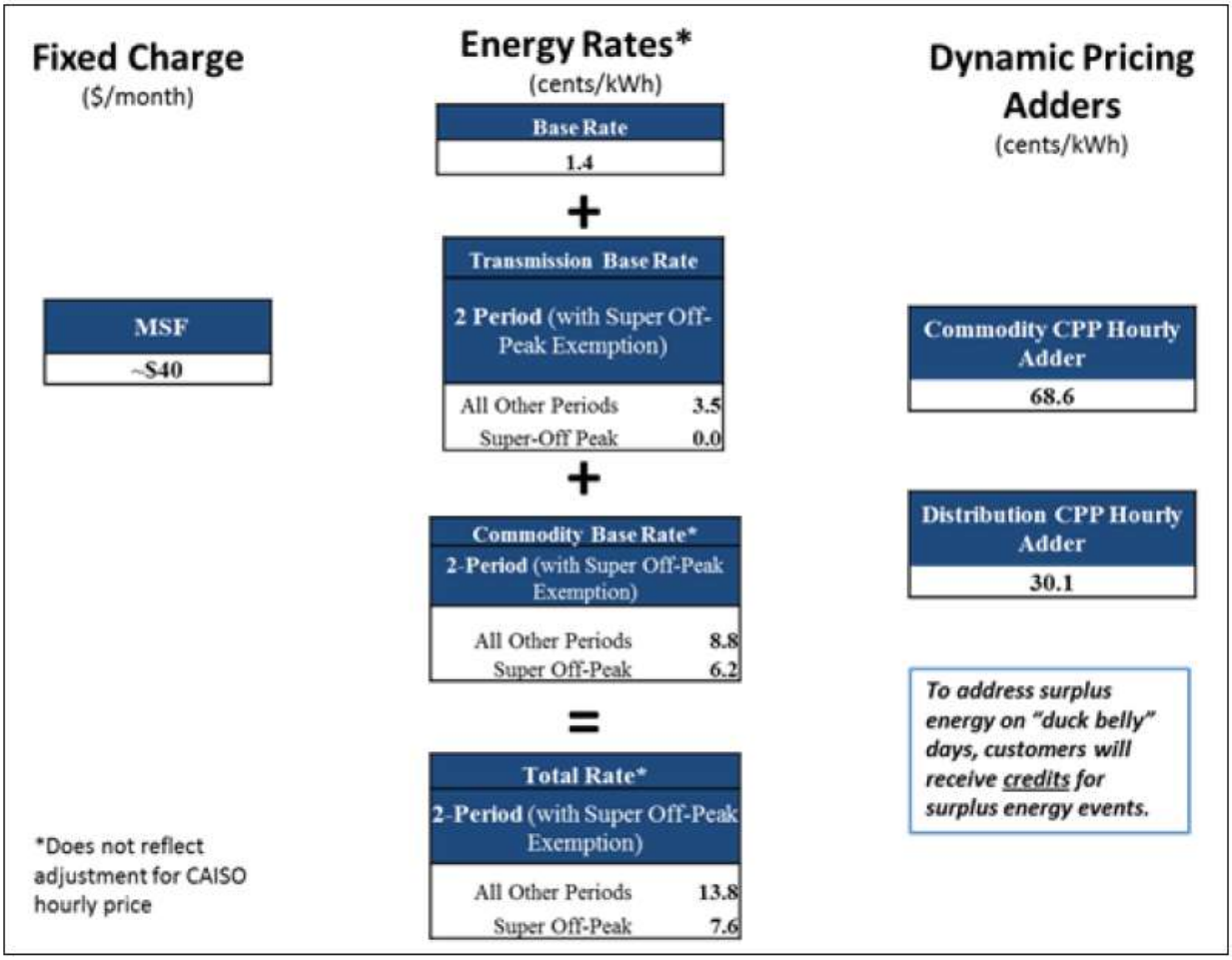
Illustrative Pricing for Rates 1 and 2

Non-CARE Energy Charge/kWh	Rate 1 (< 130% Baseline)	Rate 1 (> 130% Baseline)	Rate 2 (< 130% Baseline)	Rate 2 (> 130% Baseline)
Summer Peak	$0.41446	$0.57538	$0.41446	$0.57538
Summer Off-Peak	$0.19417	$0.35509	$0.17410	$0.33502
Summer Super Off-Peak	$0.14130	$0.30222		
Winter Peak	$0.21045	$0.34427	$0.21045	$0.34427
Winter Off-Peak	$0.20028	$0.33410	$0.19622	$0.33004
Winter Super Off-Peak	$0.19024	$0.32406		

SDG&E's pricing for pilot rates 1 and 2 illustrated above includes a baseline credit of roughly 16 cents/kWh for summer usage and 13.4 cents/kWh for winter usage. These baseline credit values will change over the course of the pilots in accordance with the tier collapse glidepaths[25] set forth in D.15-07-001.

[25] D.15-07-001 ordered the gradual transition or "glidepath" from four tiers to two tiers, with a baseline credit, from 2015 through 2018, in order to smoothly introduce incremental billing impacts to customers.

Rate 3 Period Definitions and Pricing



The super off-peak period for pilot rate 3 is the same as for pilot rate 1 (12-6am weekdays, 12am-2pm weekends/holidays), with the regular prices applying to all other hours. The Commodity CPP Hourly Adder would apply during the system's top 150 hours (approximately 1.7% of the year), and the Distribution CPP Hourly Adder would apply during a particular circuit's top 200 hours (approximately 2.3% of the year). Customers would be notified of these adders on a day-ahead basis. Customer notification of the applicability of surplus energy credits – which have an undefined value at this time – will be on a same-day basis. SDG&E's advice letter does not define how many hours a year will be subject to surplus energy credits. A monthly service fee (i.e., a fixed charge) of approximately $40 would apply to each customer.

In order to realize the Decision's vision of a menu of optional TOU rates that assist the state's broad policy goals, we must learn about the customer response to a variety of TOU rate structures and price signals in this opt-in pilot phase so that the IOUs can adequately prepare their 2018 RDW applications to include a menu of TOU rates. We find that SDG&E's proposed TOU pilot rate options provide an appropriate basis for this comparison, with one exception.

The $40/month fixed charge proposed for pilot rate 3 participants is not sufficiently justified in SDG&E's advice letter. SDG&E does not provide evidence supporting the calculation of the $40 amount. Nor does SDG&E describe how the imposition of the charge will assist with pilot rate 3's overall goal of "test[ing] a proof of concept with regard to the interdependencies of technology and rate design."[26] Such interdependencies may be tested just as easily in the absence of a $40/month fixed charge. It is the dynamism of pilot rate 3 that makes it a worthwhile pilot, not its exploration of the concept of a $40/month fixed charge.

SDG&E is therefore directed to lower the amount of the monthly fixed charge from its proposal for pilot rate 3 from $40 to $10.[27] SDG&E shall recover all other revenue through the volumetric charges utilized by pilot rate 3. SDG&E retains the discretion to determine how to recover that revenue through volumetric charges, and these changes must be illustrated in the compliance filing.

Sampling Strategy

SDG&E's proposes to recruit approximately 11,250 customers onto its three TOU pilot rates and the control rate. Approximately 2,500 customers will be assigned to each of pilot rate 1 and the control rate, 6,250 customers will be assigned to pilot rate 2, and 50-200 customers are targeted for pilot rate 3.

SDG&E's proposal is distinct from those made by Pacific Gas & Electric (PG&E)[28] and Southern California Edison (SCE).[29] Both PG&E and SCE proposed

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[26] SDG&E advice letter, Attachment A at 15.

[27] $10 is the amount set by P.U. Code Section 739.9(f) as the maximum allowable starting price for a monthly fixed charge for residential service, and we use it as a guideline for approving a monthly fixed charge for this experimental TOU pilot rate.

[28] *See* PG&E Advice Letter 4764-E.

recruiting large numbers of economically vulnerable and senior customers in their hot climate regions for all of their pilot rates. It is hoped that this will allow the CPUC to robustly analyze the impact of TOU on economically vulnerable customers and seniors as ordered by Section 745. During its discussions, the TOU Working Group determined that SDG&E's hot climate region held too few customers (~ 16,000) to allow for statistically robust sampling and analysis of the impact of all three pilot TOU rates on these groups of customers. This is because applying the sampling methodology used by SCE and PG&E to SDG&E's hot climate region would result in a very large proportion of all seniors and economically vulnerable customers in the region being enrolled onto the pilot rates and the control rate. This would not resemble an ordinary opt-in experiment, and in scope would resemble an application of a default TOU rate. We agree with SDG&E and the TOU Working Group that this would be unreasonable.

Instead, SDG&E proposes to limit sampling of customers in its hot climate region to only pilot rate 2 – the simplest and least cost differentiated of SDG&E's three pilot rates. They aim to enroll 1,250 customers on rate 2 from the hot climate region (which still constitutes almost 8% of all of SDG&E's hot climate region customers), with a focus on recruiting CARE/FERA customers first. There would be no formal control group recruitment, although statistical matching may be used in the ex post analysis phase. Given the small number of hot climate region customers, this is a reasonable approach.

We accept that this means that as part of SDG&E's 2018 RDW application for default TOU rates, it is nearly certain that there will only be evidence from pilot rate 2 to examine when considering whether seniors and economically vulnerable customers in SDG&E's hot climate region would experience unreasonable hardship as a result of TOU.

Should SDG&E find that the sample sizes as described in their advice letter require modification, while still ensuring that the deliverables as outlined in this Resolution are collected, then SDG&E may send a letter to the Director of Energy Division any time before April 1, 2016 requesting modification of their TOU pilot

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[29] *See* SCE Advice Letter 3335-E.

sample sizes. The Director is not required to approve the sample size modification and may require the use of sample sizes as described in SDG&E's advice letter at its discretion.

If, in the course of recruitment, SDG&E experiences difficulty in meeting its recruitment targets, it must consult with its pilot implementation consultant, Energy Division and the TOU Working Group on additional steps it can take to meet the recruitment targets. In the event that SDG&E believes that its TOU pilots will not be able to collect the deliverables as outlined in this Resolution, SDG&E is ordered to immediately notify the CPUC and the TOU Working Group and propose modifications to their TOU pilots that will ensure they collect these deliverables.

SDG&E's proposals for meeting its mandated deliverables

The consultant report details the specific ways in which SDG&E plans to collect the mandated deliverables, including sampling methodologies, recruitment strategies and statistical precision.

The particular details of SDG&E's implementation plans are too numerous to mention here, and we refer interested parties to the consultant report for more information. Generally speaking, we find that the mechanisms outlined in the consultant report are reasonable and should be used to guide the implementation of SDG&E's TOU pilots.

Below we outline the detailed experimental design approaches that are contained in either the consultant report or in SDG&E's advice letter that will be used to collect the mandated deliverables. At a minimum, SDG&E must employ the approaches as outlined below.

Deliverable	SDG&E's Proposal
If discoverable, the average peak and off-peak change in energy usage by seniors and economically vulnerable customers in the hot climate region as a result of pilot rate 2.	SDG&E will employ a RCT design and pay-to-play (PTP) recruitment strategy to recruit approximately 1,250 customers onto pilot rate 2 in SDG&E's hot climate region. It is not expected that load impacts will be formally estimated but they may become available if a control group can be formed used statistical matching in the ex post analysis phase.
If discoverable, the impact of pilot rate 2 on the bills of seniors and economically vulnerable customers in the hot climate region (i.e., the distribution of bill impacts).	SDG&E will reach out to all CARE/FERA households in the hot climate region and all households with incomes below $40,000 and will then recruit from the remaining population to bring the total number of pilot rate 2 enrolled customers in the hot climate region to 1,250. There will not be a formal control group due to the small size of the customer base in SDG&E's hot climate region. Normally, bill impacts would be determined by calculating bills for both treatment and control customers in two ways; as if their usage were billed on the TOU rate in question, and as if their usage were billed on the otherwise applicable tariff (OAT). The difference between those two bills will result in a distribution of bill impacts for treatment customers and a distribution of bill impacts for control customers. Comparing the two distributions will illustrate how much of the bill impact results from structural wins and losses and how much results from changes in usage in response to the TOU rate. Due to the lack of a control group in SDG&E's hot climate region, it is not expected that bill impacts will be formally estimated. They may become available if a control group can be formed used statistical matching in the ex post analysis phase.

Deliverable	SDG&E's Proposal
If discoverable, the impact of pilot rate 2 on how seniors and economically vulnerable customers in the hot climate region change their energy usage and on these customers' choices regarding other household expenses.	Normally, surveys would be administered to both treatment and control customers, and include questions regarding energy usage habits (e.g. the timing of end-use activities, thermostat settings by rate period) and barriers to load shifting or load reduction activities. Questions will also be designed to detect certain forms of hardship (e.g. not paying other bills to pay energy bill). Answers would be compared between treatment and control customers to determine whether certain behaviors or activities are higher among customers on TOU rates relative to customers on the OAT. Due to the lack of a control group in SDG&E's hot climate region, this process of formal comparison cannot be followed. Survey results of the 1,250 estimated hot climate region participants in rate 2 will still be collected and reviewed.
The average peak and off-peak change in energy usage as a result of pilot rates 1 and 2 for all customers in SDG&E's service territory, all customers in SDG&E's moderate climate region, and all customers in SDG&E's cool climate region.	SDG&E will employ a RCT design to recruit customers onto pilot rates 1 and 2, and the control rate. The total number of SDG&E customers on pilot rate 1 will be approximately 2,500 (1,250 in each of the moderate and cool regions) and on pilot rate 2 approximately 6,250 (2,500 in each of the moderate and cool regions). Sample sizes will be large enough to produce load impacts with confidence intervals in the range of ±2-3% with 90% confidence for all customers for pilot rates 1 and 2 across SDG&E's service territory as a whole and in each of SDG&E's moderate and cool climate regions. It is noted that the territory-wide load impacts for pilot rate 1 are not affected by the lack of hot climate region sampling for that rate as hot climate region customers make up such a small proportion of SDG&E's total customer base.

Deliverable	SDG&E's Proposal
The average peak and off-peak change in energy usage as a result of pilot rates 1 and 2 for CARE/FERA and non-CARE/FERA customers across SDG&E's territory as a whole.	The RCT design, PTP recruitment strategy and recruitment targets described above will create sample sizes large enough to produce load impacts with confidence intervals in the range of ±2-3% with 90% confidence for CARE/FERA and non-CARE/FERA customers for pilot rates 1 and 2 across SDG&E's service territory as a whole. As noted above, the territory-wide load impacts for pilot rate 1 are not affected by the lack of hot climate region sampling for that rate as hot climate region customers make up such a small proportion of SDG&E's total customer base.
The impact of pilot rates 1 and 2 on the bills of CARE/FERA customers and non-CARE/FERA customers (i.e., the distribution of bill impacts) in SDG&E's entire territory and in the moderate and cool climate regions separately.	Bills will be calculated for both treatment and control customers in two ways; as if their usage were billed on the TOU rate in question, and as if their usage were billed on the OAT. The difference between those two bills will result in a distribution of bill impacts for treatment customers and a distribution of bill impacts for control customers. Comparing the two distributions will illustrate how much of the bill impact results from structural wins and losses and how much results from changes in usage in response to the TOU rate. Sample sizes will be large enough to produce valid bill impact distributions for CARE/FERA and non-CARE/FERA customers for pilot rates 1 and 2 across SDG&E's service territory as a whole and in each of SDG&E's moderate and cool climate regions.

Deliverable	SDG&E's Proposal
The impact of pilot rates 1 and 2 on how CARE/FERA customers and non-CARE/FERA customers – in SDG&E's entire territory and in the moderate and cool climate regions separately – change their energy usage and on these customers' choices regarding other household expenses.	Surveys will be administered to both treatment and control customers, and will include questions regarding energy usage habits (e.g. the timing of end-use activities, thermostat settings by rate period) and barriers to load shifting or load reduction activities. Questions will also be designed to detect certain forms of hardship (e.g. not paying other bills to pay energy bill). Answers will be compared between treatment and control customers to determine whether certain behaviors or activities are higher among customers on TOU rates relative to customers on the OAT. Sample sizes will be large enough to produce valid survey data for CARE/FERA and non-CARE/FERA customers for pilot rates 1 and 2 across SDG&E's service territory as a whole and in each of SDG&E's moderate and cool climate regions.

Deliverable	SDG&E's Proposal
The level of customer understanding, acceptance, and engagement while taking service on a given TOU rate among various customer segments.	The recruitment approach for SDG&E's TOU pilots does not allow for a direct measure of acceptance rates for each rate option because customers are being paid to participate in the study (and to stay on the rate) and will be randomly assigned to pilot rates 1 or 2. Instead, surveys will be used to assess customer awareness, understanding, and satisfaction and these metrics can be compared across rate options as an indirect measure of customer acceptance. Sample sizes will be large enough to produce valid survey data for a variety of customer segments. As part of the end-of-pilot survey in the summer of 2017, customers will be asked whether they would prefer to stay on the TOU rate or return to the OAT. They will also be asked if they would prefer one of the other TOU rates if they had an option. Following payment of the last portion of the incentive, which will be made after completion of the end-of-pilot survey, differential dropout rates will be tracked as an indicator of customer preferences.

Deliverable	SDG&E's Proposal
The impact of usage alerts and/or other technology on energy usage and/or customer understanding, acceptance, and engagement while taking service on a given rate.	SDG&E will double the number of cool and moderate climate region customers on pilot rate 2 and automatically enroll half of the participants in each climate region in the usage alert system that SDG&E is developing for the TOU pilots. Incremental load impacts will be estimated for participants who receive the alerts and SDG&E will also assess customer interest in, satisfaction with, and use of the usage alert through customer surveys. SDG&E plans to make the tips and tools information on their TOU pilot microwebsite available to pilot participants through a smartphone application. Users of the app would also be able to receive push notifications containing reminders of TOU period rate changes. As with other outreach materials, SDG&E will assess the impact of the app on customer understanding, acceptance and engagement using customer surveys.

Deliverable	SDG&E's Proposal
For participants on pilot rates 1 and 2, evaluate the take rates for smart thermostats at two different rebate levels and qualitatively assess their usefulness to households that accept them. If possible, estimate load impacts of smart thermostat usage.	For the purposes of this pilot, SDG&E defines a smart thermostat as a device that is internet-connected and capable of receiving and responding to real-time information or equipped with the sensors and software necessary to automatically adjust to customer behavior. SDG&E's technology treatment will attempt to increase the purchase rate of smart thermostats by offering two different rebate amounts for the purchase of a smart thermostat. One of these offers will be made to all customers enrolled in SDG&E's pilot rates 1 and 2. If a sufficiently large number of customers purchase smart thermostats through the subsidies that will be offered, SDG&E will estimate load impacts for the purchasing households using a pseudo-control group developed using ex post statistical matching. The smart thermostat offer will be made after the first summer of the TOU pilot.
For participants on pilot rate 3, assess customer interest, acceptance and understanding of the hourly rate; identify what strategies customers use to respond to hourly prices; identify what strategies customers use to respond to an over-generation credit; and assess the effectiveness of enabling technologies in conjunction with an hourly rate.	SDG&E's pilot rate 3 will test a proof of concept with regard to customer interaction with advanced technologies. Customers must have or purchase a smart programmable thermostat that is installed and operating at the onset of the pilot. Although there are many enabling technology options, SDG&E will be offering all pilot rate 3 customers rebates for the purchase of a new smart thermostat, installation or replacement of existing pool pump and motor or upgrade of electric vehicle charging equipment. Surveys of pilot rate 3 customers will presumably be used to conduct this assessment.

Deliverable	SDG&E's Proposal
The impact of education and outreach (E&O) materials that are tailored to various customer segments (including seniors, renters, and non-English speaking customers) and to certain cognitive profiles/customer personas on customer understanding, acceptance, and engagement while on a TOU rate.	Surveys will be used to assess usefulness and preferences for each of the primary types of E&O materials. Responses will be compared across rate options, customer segments and customer personas to determine whether different treatment groups, customer segments or customer personas find some materials more or less useful than others. Answers to survey questions pertaining to customer awareness, understanding, and satisfaction, and other metrics will also be compared across rate options, customer segments and customer personas to determine whether there are significant differences in these metrics.

Ensuring education and outreach (E&O) material is appropriately tailored to a variety of different customers to ensure the success of the TOU pilots

The transition of California IOU customers to TOU rates will be a complex process that requires extensive education and outreach to customers to help them understand TOU rates. It is important that the TOU pilots test E&O approaches that will help the IOUs ensure that the rollout of TOU as a default residential rate in 2019 is a success and that Californians see the value in the switch to TOU rates.

SDG&E will conduct two E&O campaigns, one for customers on pilot rates 1 & 2 and a second campaign for customers on pilot rate 3. While many of the tactics will be the same or similar for both groups of customers, the messaging within will be very specific to the rate and in some instances, specific to the customer persona or segment.

SDG&E proposes to provide all pilot participants with a "Welcome Kit" at the start of the pilot, and follow-up direct mail, email or text communications. These

follow-up communications will be tailored for a customer's segment/persona, and the messaging will focus on behavioral changes that may help reduce energy usage.

These direct communications will be supplemented by dedicated microwebsites for each rate and possibly social media channels for each rate.

SDG&E is planning to tailor E&O materials to address the special needs of particular groups, including but not limited to different ethnicities, non-English speaking customers, seniors, and its most vulnerable customers. SDG&E will also develop materials based on five different customer personas/segments.

We find SDG&E's E&O plan to be reasonable, and support the use of customer personas/psychographic profiles and other customer data points to craft targeted messaging for pilot participants. SDG&E's customer base is diverse and different customers will likely respond to TOU rates in different ways.

Technology

As noted previously, SDG&E is planning a variety of technology treatments for their pilot participants.

Half of the pilot rate 2 participants in cool and moderate climate regions will be automatically enrolled in a usage alert system. SDG&E will estimate incremental load impacts for participants who receive the alerts and SDG&E will also assess customer interest in, satisfaction with, and use of the usage alert through customer surveys. A smartphone application will also be developed by SDG&E that will duplicate the information displayed on the microwebsite for a given TOU pilot rate. The effect of this application on customer awareness, understanding and engagement while on a rate will be tested.

SDG&E will also offer all pilot rate 1 and 2 participants rebates for the purchase of new smart thermostats to uncover the effect of rebates on take-up rates for smart thermostats. If possible, SDG&E will estimate load impacts of the smart thermostats.

Finally, pilot rate 3 in general will test the responsiveness of customers with pre-existing smart thermostats to a dynamic hourly rate. SDG&E will assess the effectiveness of smart thermostats and other enabling technologies in conjunction with this dynamic hourly rate.

We find that SDG&E's various technology treatments will provide important learnings about the potential for such technology to improve customer understanding of, acceptance of and engagement with TOU rates. We approve SDG&E's technology treatments as proposed.

Recruitment

SDG&E proposes to send materials to approximately 112,500 customers seeking to recruit them on to either pilot rate 1 or 2. In the event that initial recruitment targets are not being met, SDG&E may also conduct outbound calling to customers who do not respond to initial recruitment offers. During the enrollment, customers will be informed through the pilot terms and conditions that by agreeing to participate they certify that there is no one living in their home who has a medical issue that relies on a constant supply of electricity, or that they have plans to convert to solar in the next 18 months.

For pilot rate 3, SDG&E will use a more traditional opt-in recruitment strategy, focusing its marketing efforts specifically on customers who may benefit from this rate. SDG&E's goal is to recruit between 50 and 200 customers for this rate schedule. While SDG&E is finalizing the recruitment strategy for pilot rate 3, preliminary plans are to recruit from the approximately 19,000 SDG&E customers that currently own electric vehicles.

In its advice letter, SDG&E does not specify whether bill protection will be offered to pilot participants. The IOUs are conducting pre-tests to examine a number of facets of the recruitment process, including delivery channel, incentive amount, payment schedule, bill protection and the enrollment rates of different customer segments.

We find SDG&E's recruitment approach to be generally reasonable, but recognize that many elements of the final recruitment drive will be impacted by the results of the IOUs' recruitment pre-tests. SDG&E must offer bill protection

to pilot participants if it is determined by Energy Division to be necessary to achieve recruitment targets and participant retention.

We therefore order SDG&E to consult with its pilot implementation consultant, Energy Division and the TOU Working Group on the final recruitment approach once the pre-test results become available.

SDG&E does not clearly specify how it will target its recruitment to achieve the necessary samples of customers. In any event, we order SDG&E to include questions in its enrollment questionnaire to collect self-reported data on the following: household income, number of people in the household, number of seniors in the household, and age of head of household. We order SDG&E to consult with its pilot implementation consultant, Energy Division and the TOU Working Group to determine whether to use the self-reported data or another method to assign enrolled customers to sampling segments. SDG&E must develop and maintain practices to assure that individual customer data confidentiality is maintained both within its own use of such records as well as in any reports to CPUC staff and the Working Group.

In addition, we order SDG&E to provide in-language support to those customers who call SDG&E to ask questions and/or to enroll in the pilot to further facilitate participation by non-English speaking customers. Recruitment materials must have key messages in large print as well.

Interaction of other customer communications with the experimental integrity of the TOU pilots

The Decision requires SDG&E to send paper bill comparisons to their customers twice per year starting in 2016.[30] It is likely that if TOU pilot participants receive these bill comparisons, the experimental integrity of the TOU pilot may be compromised. This is because customers receiving the comparison may be told that they would be better off under a different rate and therefore would be encouraged to leave the experiment at the same time that their participation is most critical. We therefore order SDG&E to not send bill comparison reports to pilot participants. For similar reasons, we also order SDG&E to shield pilot

[30] D.15-07-001 at 142.

participants from recruitment outreach materials for their existing opt-in TOU rates. To do otherwise would confuse pilot participants about the nature of their own TOU rate and potentially persuade them to leave the pilot prematurely.

Evaluation and analysis of the data that emerges from the TOU pilots

The vast amount of data that emerges from the TOU pilots will require extensive ex post measurement and evaluation (M&E) to produce the deliverables outlined above. Much of the information to be gathered from the TOU pilots will depend on surveys of pilot participants. This is particularly true concerning the explanations for behaviors underlying any shift or reduction in usage by pilot participants, and the attribution of the impacts of specific E&O materials on customer understanding, acceptance and engagement while on a given TOU rate.

The IOUs have proposed, and the TOU Working Group is considering, the hiring of a consultant to advise the TOU Working Group on the design of the M&E study plan and eventually to execute the study plan. A single consultant may advise on both the M&E study plan and the survey instrument used in the course of the M&E study plan, or separate consultants may be hired for the M&E study plan and the survey instrument development. This is consistent with the Decision's authorization of the hiring of a consultant by the TOU Working Group to advise on pilot study parameters.

While both SDG&E's advice letter and the consultant report begin the process of detailing the survey topics, surveying methodology, ex post measurement and evaluation, and evaluation criteria to be used to generate this information, we make no finding at this time concerning these items. Instead, we note that SDG&E, along with the other IOUs and the TOU Working Group, will be scoping and issuing a Request for Proposals (RFP) for a survey and M&E consultant(s). Thus, we order SDG&E to work closely with this consultant, the Energy Division and the TOU Working Group to develop the TOU pilot participant survey topics, surveying methodology, ex post M&E methodologies and evaluation criteria. Furthermore, with respect to the number of surveys, we direct SDG&E to consult with the survey consultant, the Energy Division and the TOU Working Group to decide whether or not to survey pilot participants a

third time after the summer of 2017, and whether or not to offer an incentive payment for completion of this survey.

We expect this working relationship to closely mirror that of the Project Coordination Groups (PCGs) that exist in the Energy Efficiency Evaluation, Measurement and Verification Plan.[31] Specifically, we order SDG&E to work with Energy Division and the TOU Working Group to initiate a Level 3 PCG, or Research Project Team, that is responsible for project scoping, and vetting of instruments and deliverables.

Cost of the TOU pilots

In its advice letter, SDG&E estimated the cost of all three TOU pilots to be approximately $9 million. The actual costs will not be precisely known until after the pilots are completed.

These costs will be tracked in SDG&E's Rate Reform Memorandum Account and their reasonableness will be assessed in a future CPUC proceeding.

SDG&E must include information on the actual costs incurred as the pilots progress in its quarterly Progress on Residential Rate Reform report.[32]

General concerns regarding the deficiencies of AL 2835-E

As noted in the background section, SDG&E's original AL 2835-E setting out its residential TOU pilot plans contained deficiencies that required the filing of supplemental AL 2835-E-A on January 22, 2016. These deficiencies included the apparent replication of some material from PG&E's TOU pilot plan advice letter, inconsistent figures regarding the number of customers subject to recruitment or technology treatments, and difficult to understand and/or inconsistent descriptions of cost estimates.

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[31] 2013-2015, Energy Division & Program Administrator, Energy Efficiency, Evaluation, Measurement and Verification Plan, Version 5, CPUC, May 2015 at 293-294. Generally, a Level 3 PCG discusses the research objectives, data collection instruments, and overall methodologies for a given study. The Level 3 PCG consists of IOU staff, ED staff, and any contractors/consultants.

[32] *See* D.15-07-001 at 299.

These deficiencies are concerning as the TOU pilot plans are critical to the implementation of default TOU rates for residential customers in 2019, and therefore the IOUs must take these pilots as seriously as possible. SDG&E's first official filing regarding the TOU pilots did not demonstrate sufficient attention to detail, and was arguably misleading on an important ratemaking matter. The CPUC appreciated receiving a direct apology from SDG&E for the original advice letter filing at the R.12-06-013 status conference on February 4, 2016. The CPUC's investigation of the original filing is ongoing.

Approval of SDG&E's TOU Pilot Plan advice letter

We find that SDG&E's proposed TOU pilots are largely sufficient to gather the required information and meet the required deliverables but must be modified as outlined in this Resolution. SDG&E shall file a supplemental advice letter in compliance with this Resolution within 21 days. We conditionally approve the proposed tariffs in SDG&E's advice letter.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

The Office of Ratepayer Advocates (ORA) filed comments on the draft resolution on March 7, 2016. In their comments, ORA argues that SDG&E's pilot rate 3 should be rejected as it is duplicative of other research being conducted by SDG&E pursuant to D.16-01-045. ORA states that the vehicle-grid integration (VGI) pilot program authorized by D.16-01-045 allows SDG&E to own some electric vehicle (EV) charging stations and use an approved VGI rate. According to ORA, the purpose of the VGI rate is to alleviate the impact on the electricity

grid by shifting usage to periods when there is a surplus of electricity such as excess solar generation in the afternoon, or during off-peak periods. ORA argues that the research undertaken by SDG&E's VGI pilot is similar enough to SDG&E's proposed pilot rate 3 that it should be rejected. ORA cites the P.U. Code Section 740.1(d) prohibition of "unnecessarily duplica[tive] research" in support of its argument.

ORA further argues that SDG&E's pilot rate 3 should be rejected because it does not enhance research into potential residential TOU rates that may become default rates for SDG&E customers. SDG&E's premise is that as a dynamic rate, SDG&E's pilot rate 3 cannot become a default residential rate and therefore does not fulfill the mandate of the Decision or the ACR to study default residential TOU rates.

SDG&E also filed comments on the draft resolution on March 7, 2016. SDG&E focuses its comments on the resolution's requirement that the proposed $40/month fixed charge for pilot rate 3 be lowered to $10/month. SDG&E argues that the TOU pilot plans were never meant to be a forum to litigate the appropriate amount of a fixed customer charge, and therefore the draft resolution's reasoning that $40 was an inappropriate figure due to a lack of supporting evidence is immaterial. SDG&E also argues that the purpose of pilot rate 3 is to test customer response to the rate as a total package, and not to litigate the merits of a particular rate design. SDG&E states that the reduction of the monthly fixed charge from $40 to $10 would affect the design of pilot rate 3 such that the volumetric rate for low-cost hours would increase. SDG&E argues that the monthly fixed charge should therefore be unmodified to test customer response to the rate design as a whole – including relatively low volumetric rates.

SolarCity also filed comments on the draft resolution on March 7, 2016. SolarCity supports lowering pilot rate 3's monthly fixed charge to $10. SolarCity requests that the resolution adopt specific guidelines regarding the boundaries for critical peak pricing (CPP) events under pilot rate 3. SolarCity sets out a hypothetical situation where CPP events become so long under pilot rate 3 that customers would find participation burdensome. SolarCity also makes a series of recommendations for how the boundaries should be set, including setting a fixed

window for CPP hours, setting a limit on the number of consecutive days that CPP hours can be called, and setting a limit on CPP event duration.

Finally, UCAN filed comments on the draft resolution on March 7, 2016. Like ORA, UCAN argues that pilot rate 3 should not be tested as it is unlikely to become a default TOU rate and is therefore is not critical to study at this time. UCAN asserts that the goal of the TOU pilots is to study potential parameters of a default TOU rate. UCAN also argues that pilot rate 3 will possibly be duplicative of the dynamic rate being testing as a result of D.16-01-045 (i.e., the VGI rate). UCAN specifically recommends that the costs associated with pilot rate 3 be denied unless pilot rate 3 is redesigned to inform the design of a potential default TOU rate that is distinct from pilot rates 1 and 2.

We turn first to ORA's argument that pilot rate 3 is too similar to the VGI rate adopted in D.16-01-045 to justify its study in the Residential Rate Reform proceeding (R.12-06-013). To address this argument, we must compare the two rates.

Rate Feature	**SDG&E Pilot Rate 3**	**D.16-01-045 VGI Rate**
Location	Home of pilot participant (may include EV charger)	EV charging station[33]
Objective	Assess customer interest, acceptance and understanding of an hourly rate; identify what strategies customers use to respond to hourly prices; identify what strategies customers use to respond to an over-generation credit; and assess the effectiveness of enabling technologies in conjunction with an hourly rate.	Learn more about customers' EV charging behavior when exposed to hourly prices designed to encourage grid-integrated charging.
Required technology	PCT (participants may also own an EV charger)	EV charger
Rate Design	Dynamic hourly, with a monthly fixed charge, adders for high-cost hours and credits for low-cost hours.	Dynamic hourly, with adders for high-cost hours and credits for low-cost hours, but without a monthly fixed charge.

[33] Theoretically the Rate-To-Host option could encompass a master-metered residential building but this does not change our analysis as the VGI rate is still designed to facilitate EV charging and would not be usable by individual residential customers in the mater-metered environment.

As revealed above, pilot rate 3 and the VGI rate are not identical. One includes a monthly fixed charge while the other does not. The technology requirements for the two rates are also distinct. The research objectives are different as well, and are related to the fact that the end-user analyzed in the two studies is not the same. The VGI rate pilot only wishes to test the response of an EV owner to a dynamic rate, using their EV as a source of load. Pilot rate 3 wishes to test the response of a residential customer to a dynamic rate, using their entire residence (not necessarily including an EV) as a source of load.

Therefore, the critical distinguishing feature of SDG&E's proposed pilot rate 3 is that it goes well beyond an examination of EV charging under a dynamic hourly rate and extends the analysis to the entire home of a customer. ORA is correct that SDG&E may initially target EV customers for pilot rate 3; but even if EV customers make up the majority of pilot rate 3 participants the load of the entire residence of the pilot participant will become part of the study. This is what makes pilot rate 3 appropriate for the context of the *residential* TOU pilots. This is also why the research is not duplicative of the VGI pilots authorized by D.16-01-045 – those findings will be focused on the changes in load at the EV charging location, while the findings for pilot rate 3 will focus on load across an entire residence in response to a dynamic hourly rate.

To ORA's second point regarding the suitability of pilot rate 3 as a default TOU rate for residential customers, both the Decision and the ACR refer to the need to develop a menu of TOU rates for residential customers. The ACR explicitly refers to the possibility that a dynamic rate could be a part of the menu approach. While it may be unlikely that pilot rate 3 would become a default TOU rate for SDG&E's residential customers, it does comply with the ACR's requirement for a more complicated rate option that goes beyond standard TOU rate design that may incorporate more dynamic pricing features and enabling technologies. It is not necessary for all of SDG&E's pilots to resemble potential default residential TOU rates.

We now turn to SDG&E's comments. Their arguments would seem to imply that the CPUC should simply approve whatever is proposed without CPUC review or modification.

The Decision and the ACR never contemplated a situation where an IOU would receive approval from the CPUC for a proposed residential TOU pilot without any scrutiny or review. Furthermore, the Decision and the ACR both set parameters for the design of the TOU pilots, and the CPUC's role is clearly to determine whether the TOU pilots proposed by SDG&E meet those parameters.

As noted by SDG&E in its advice letter and its comments on the draft resolution, the Decision specifically restricts SDG&E's ability to propose monthly demand differentiated charges for its TOU pilot rates.[34] While SDG&E attempts to distinguish the proposed pilot rate 3 monthly fixed charge from SDG&E's rejected demand differentiated charge, this distinction does not preclude or impact the Decision's overall restriction on fixed charges when it comes to designing the TOU pilots.

We reject SDG&E's argument that their proposed $40/month fixed charge be approved. Instead, we continue to believe that if a monthly fixed charge is to be part of the design of pilot rate 3, its level should be based on the statutory limit of $10.

With respect to SolarCity's comments, we decline to set out specific boundaries for the CPP event hours in SDG&E's pilot rate 3 at this time. We continue to believe this is appropriate work for the TOU Working Group to conduct this year before pilot rate 3 becomes operational, and encourage SolarCity to raise its proposed guidelines in that forum.

Regarding UCAN's comments, we note that they mention that there is no language in the Decision that prohibits testing of a TOU rate such as pilot rate 3.[35] As stated above, the ACR actually encourages a proposal for a more complex rate design than is traditionally seen – and pilot rate 3 certainly fulfills that requirement.

With respect to UCAN's implied request for a rationale for the usefulness of pilot rate 3, both the Decision and the ACR note the need to provide a menu of TOU

[34] SDG&E AL 2835-E-A, Attachment A at 15-16; SDG&E Comments on Draft Resolution at 3.

[35] UCAN Comments at 3.

rate options to residential customers. SDG&E's pilot rate 3, or some variation thereof, could potentially become one of those rate options not only for SDG&E customers, but for PG&E and SCE customers as well. It is critical, therefore, that pilot rate 3 be studied at this time in order to inform the development of the IOU RDW applications for residential TOU rates due on January 1, 2018. Whether a rate like pilot rate 3 is offered as an option may depend on the findings of this pilot. For these reasons, we reject UCAN's recommendation to redesign pilot rate 3.

As for UCAN's argument that pilot rate 3 is duplicative of the VGI rate approved in D.16-01-045, we refer to our reasons for disposing of that argument in reference to ORA's comments above.

FINDINGS

1. SDG&E's proposed rate structures conform to D.15-07-001 (the Decision) and the Joint Assigned Commissioner's and Administrative Law Judge's Ruling (ACR or Ruling) of September 24, 2015 and are therefore acceptable.
2. We find that the mechanisms outlined in the TOU Working Group's final report are reasonable and should be used to guide the implementation of SDG&E's TOU pilots.

THEREFORE IT IS ORDERED THAT:

1. San Diego Gas & Electric Company's (SDG&E's) Time-of-Use (TOU) Pilot Plan advice letter (AL 2835-E/A) is approved as modified herein.
2. SDG&E is directed to lower the amount of the monthly fixed charge in its pilot rate 3 from $40 to $10. SDG&E shall recover all other revenue through the volumetric charges utilized by pilot rate 3. SDG&E retains the discretion to determine how to recover that revenue through volumetric charges, and these changes must be illustrated in the compliance filing.
3. SDG&E shall draw on various customer data points, including its five customer personas/psychographic profiles, to ensure that its education and

outreach (E&O) messages are well-informed, relevant, and targeted to the different motives behind customer energy usage behavior.

4. SDG&E shall consult with its pilot implementation consultant, Energy Division and the TOU Working Group on the following:
    a. A final recruitment plan.
    b. Whether it is necessary (as determined by Energy Division) to offer bill protection to pilot participants to achieve recruitment targets and participant retention.
    c. Whether to use self-reported data or another method to assign enrolled customers to sampling segments.
5. SDG&E shall provide in-language support to those customers who call SDG&E to ask questions and/or to enroll in the pilot. Recruitment materials must have key messages in large print as well.
6. SDG&E shall include questions in its enrollment questionnaire to collect self-reported data on the following: household income, number of people in the household, number of seniors in the household, and age of head of household. SDG&E must develop and maintain practices to assure that individual customer data confidentiality is maintained both within its own use of such records as well as in any reports to CPUC staff and the TOU Working Group.
7. In the event that SDG&E believes that its TOU pilots will not be able to collect the deliverables as outlined in this Resolution, SDG&E is ordered to immediately notify the CPUC and the TOU Working Group and propose modifications to their TOU pilots and/or schedules that will ensure they collect these deliverables.
8. SDG&E is ordered to ensure that the deliverables as outlined in this Resolution are presented as part of its January 1, 2018 Rate Design Window (RDW) filing for a default TOU rate and a menu of TOU rate options.
9. SDG&E must work closely with the survey consultant, Energy Division and the TOU Working Group to:

a. Develop the TOU pilot participant survey topics, survey plan and the measurement and evaluation plan.

b. Decide whether or not to survey pilot participants a third time after the summer of 2017, and whether or not to offer an incentive payment for completion of this survey.

c. Initiate a Level 3 Project Coordination Group, or Research Project Team, that is responsible for TOU pilot measurement and evaluation scoping, and vetting of instruments and deliverables.

10. SDG&E must ensure that paper bill comparisons are not sent to TOU pilot participants, including the control participants, in order to ensure the integrity and successful execution of the pilots.

11. SDG&E must include information on the actual costs incurred as the pilots progress in its quarterly Progress on Residential Rate Reform report.

12. SDG&E shall file a supplement to AL 2835-E/A within 21 days of this Resolution's adoption with modifications reflecting the required changes of this Resolution.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on March 17, 2016; the following Commissioners voting favorably thereon:

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TIMOTHY J. SULLIVAN
Executive Director