BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Conduct a Comprehensive Examination of Investor Owned Electric Utilities' Residential Rate Structures, the Transition to Time Varying and Dynamic Rates, and Other Statutory Obligations	Rulemaking 12-06-013 (Filed June 21, 2012)

RESIDENTIAL RATE DESIGN PROPOSAL OF THE CALIFORNIA LARGE ENERGY CONSUMERS ASSOCIATION

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This residential rate design proposal is submitted pursuant to the ruling of Administrative Law Judges (ALJ) Timothy Sullivan and Jeanne McKinney dated March 19, 2013 (ALJ Ruling). The California Large Energy Consumers Association (CLECA)[1] recommends residential rates be re-designed to conform more closely with California's energy policy goals. The redesigned residential rates should incorporate default time-of-use (TOU) rates with optional dynamic pricing rates, a fixed charge of $5/month, significant customer education and reformation of the low income and medical baseline programs.

Sections I and II offer a brief introduction and prioritization of rate design principles, followed in Section III by CLECA's recommendations for residential rate design. In Section IV, various alternative rate options are analyzed, citing empirical information as support. CLECA's recommendation is based on the

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1 The California Large Energy Consumers Association is an organization of large, high load factor industrial electric customers of Southern California Edison Company and Pacific Gas and Electric Company. CLECA member companies are in the cement, steel, industrial gas, beverage and pipeline industries. CLECA has been an active participant in Commission regulatory proceedings since 1987.

results of this analysis of rate options. In Section V, these comments briefly respond to those Questions for Rate Design Proposal contained in Attachment A to the ALJ Ruling not addressed in previous sections.

I. Introduction

Why is a group of industrial customers interested in residential rate design? Residential rate design affects all customer classes for several reasons. Residential rate design affects residential usage patterns and thus overall system costs. California utilities now have low load factors and large summer peaks. This results in spreading fixed costs over relatively less load, raising rates. Residential rate design that rewards changing residential load patterns in ways that lower costs could benefit the entire system, as well as reducing costs to serve residential customers.

Residential energy usage represents roughly 33% of all kilowatt hours (kWh) sold by Southern California Edison Company (SCE) and 37% of all kWh sold by Pacific Gas and Electric Company (PG&E). It represents 39% of coincident peak load for SCE and 42% for PG&E.[2] These data make it clear that residential load represents a very large fraction of the usage on the system at any given time. Thus changes in residential usage have a large potential to affect the overall loading on the system at any time.

In addition, the costs of the low-income California Alternate Rates for Energy (CARE) program and the provision of reduced rates for residential customers with medical needs are spread to all customers, including industrial

[2] We did not have ready access to such information for SDG&E but there is no reason why it would not be comparable. The demand data are 12-CP.

customers, on an equal cents per kWh basis. Since industrial customers generally have high load factors, they pay a larger proportion of CARE costs as a percentage of their electricity bills than do other customers. The costs of the electric CARE program exceed $1 billion per year. This significantly impacts industrial customers.

For all these reasons, residential rate design is of direct interest to customers of all classes of end users.

II. Rate Design Priorities

The ALJ Ruling includes a set of principles for rate design. CLECA's analysis and proposals are consistent with these principles except with respect to stability. As changes in residential rate design are needed, some loss of stability will result. However, with an appropriate transition period and effective customer education, the end result will be a better rate design consistent with the other principles and objectives.

There should be clear priorities among the principles. The key principles should be prioritized in the following order:

1. **Cost causation**. Customer usage imposes costs on the electrical system and rates should reflect the imposition of those costs. The various customers within a class can impose very different costs, depending on their usage patterns.[3] If their rates do not reflect these different costs, cross-subsidies occur.

2. **Economically efficient decisionmaking by customers**. Correct price signals regarding when to use or not use electricity encourage economically efficient decisions. Customers who see rates

[3] "[A]ll customers do not necessarily impose the same average costs on the system. If rates do not recognize these differences it results in cross-subsidies and inefficient incentives." Effective and Equitable Adoption of Opt-in Residential Dynamic Electricity Pricing", Severin Borenstein, Hass WP-229 (April 2012) at 7.

below costs have an incentive to consume more than would be economically efficient and vice versa.

3. **Encourage drop in peak, which will reduce system costs**. Notably, this principle should be re-stated as a goal of changing load shapes such that overall costs are reduced. Reducing peak loads can increase system efficiency by increasing the load factor and more cost-effectively use of supply-side resources; however, a drop in peak demand is not the only important consideration when it comes to changing load shapes. Rates should also encourage load-shifting that will reduce increased ramping requirements anticipated to occur due to intermittent renewable resources. The California Independent System Operator (CAISO) has developed the concept of "net load" which is load less the output of intermittent renewable generation. It preliminarily forecasts an increase in ramping requirements when the output of solar photovoltaic systems (PV) falls off in the afternoon. The need for flexible generation to follow the consequent ramp could increase costs for all customers, including residential ones. Rate design can help to increase loads during the pre-ramp period and lower loads during the end of the ramp to reduce the ramping requirement. Of course, the rate design should encourage those who can shift their loads to do so without unduly penalizing those who cannot.

4. **Avoid cross-subsidies**. Cross-subsidies lead to less economically efficient decisionmaking. If there are policy reasons for subsidies, the subsidies should be minimal and transparent; they should not interfere with price signals. The same policy the Commission has adopted for return of greenhouse gas (GHG) allowance revenue to residential customers (not interfering with price signals) should apply to low-income customers.

5. **Meet needs of low income and medical needs customers**. This clearly is important. However, rate design is not the only way to accomplish this objective. As noted above, subsidies should not interfere with price signals. Low rates, priced below cost, such as those for the first two residential tiers and CARE rates, can lead to inefficient consumption or consumption at times that are most costly for the system.

Clearly all of these priorities are interrelated, as are their solutions. Care must be taken to ensure that in solving one problem, another is not created.

Generally, residential customers should see cost-based rates that include recognition of the existence of fixed costs and of costs that vary with time of usage. Such rates should allow residential customers to take advantage of the relative flexibility of their use by shifting usage temporally, thereby changing the shape of residential load in a way that reduces system costs. The allocation of costs to residential customers should then reflect their resulting lower cost to serve and, eventually leading to lower residential rates.

The issues of residential rate design are broader than fixed charges and flat vs. tiered (aka increasing block rates) vs. Time-of-Use (TOU) rates, although these are important features of the rate design.   Dynamic pricing is an essential option for residential customers; this is particularly important given the demonstrated, significant residential customer responses to dynamic pricing options made available in numerous pilots. Such residential customers benefited from dynamic pricing through lower bills and increased energy efficiency. Given their potential flexibility and potential effect on overall system costs, all residential customers should have dynamic rate options that reflect the benefits of their ability to shift load. Furthermore, residential customers who can shift load to reduce costs should see the benefit in their own rates, leading to reduced bills.

III. CLECA's Recommended Residential Rate Design

A. Default TOU Rates with Dynamic Pricing Options

There should be a transition from the current increasing block rate structure to default TOU rates with dynamic pricing options for all residential customers. Such a transition should take place over 4-5 years, but the clear direction from the beginning should be that the final rate design would be TOU with optional dynamic pricing. In the interim, optional TOU and dynamic pricing rates should be available for all residential customers, with the rates set initially on a revenue neutral basis. However, if customers on these rate schedules demonstrate a lower cost of service, the revenue requirement recovered from the rate schedules should reflect these lower costs. Any shortfall should be recovered from customers on the default rate schedules.

B. Fixed Charge of $5/Month

There should be a minimum fixed charge of $5 per month effective as of the implementation of phase two each utility's next general rate case. While this will only cover a fraction of the fixed costs of serving residential customers, it will be a step toward a more cost-based rate design.

C. Customer Information and Education and Shadow Billing

A major, well-designed, customer information and education program should be undertaken to prepare customers for these changes; this program should also inform them of the possible benefits of TOU and dynamic rates, depending on their usage patterns. The utilities should be directed to provide shadow billing for TOU and dynamic rates within two years of the start of the transition or earlier, if possible, so that customers who can benefit will receive that information. Customers taking TOU and dynamic pricing should be offered rebates on programmable communicating thermostats (PCTs) and provided with clear, straightforward information on how to program those thermostats to meet their own price response requirements. There should be standards for these PCTs but they should be owned by the consumers, not the utilities. Customers should have some ability to override their PCTs. The details of the use of this technology would have to be worked out, but it is important that customers be in control, not the utility.

The results of the 2011-2012 Sacramento Municipal Utility District (SMUD) Residential Summer Solutions Study by Herter Energy Research Solutions are impressive; notably, this recent study analyzes rate design for residential ratepayers here in California. It should inform the Commission's considerations here, and its recommendations are included as Attachment A.

D. Low Income/Medical Subsidies

At the same time, the Commission should undertake a revision of the CARE rate program, with appropriate Legislative changes. The revisions should enable CARE customers to receive bills showing their true cost of service and providing any bill reduction assistance as a separate line item. The Commission should consider a monthly cap on CARE assistance similar to that of SMUD.

IV. Analysis of Various Rate Design Options

The following analysis provides the basis for the conclusion that CLECA's recommended rate design is the most appropriate rate design. It shows that:

- ✓ there is a need for a fixed charge,
- ✓ tiered rates (aka increasing block rates) do not accomplish the goals that their proponents claim tiered rates meet,
- ✓ TOU rates have merit, while the introduction of mandatory TOU rates must be well-managed, and
- ✓ adding an optional dynamic component to residential rates is important. It has been shown on numerous occasions to provide benefits for the system and for the participating customers as they reduce their demand, their energy use, and their electric bills.

A. Rate Design Options

1. Fixed Charges

Fixed charges are often used for recovery of fixed costs. These include the fixed costs of metering, billing, and customer service, which do not change with the amount of electricity a customer uses. These charges are standard for non-residential customers. There is no cost basis for not having fixed charges for residential customers.

Allegations are often made that fixed charges impose disproportionate costs on smaller users, since they represent a larger percentage of a smaller customer's bill. Even if true, these arguments do not refute the fact that these customers impose these fixed costs. Furthermore, if there are no fixed charges, these costs will be recovered through volumetric charges. In an increasing block structure, larger users will pay for these costs. In a flat rate structure, these costs will be spread across all usage, so larger users will still pick up a large share of the costs, just less than they would in an increasing block structure.

The impact of a fixed charge would increase bills for smaller users, but it does not have to represent a dramatic change. Severin Borenstein reviewed the impact of a fixed monthly charge combined with a reduction in higher-tier prices under an increasing block rates rate structure.[4] "Assuming a $5/month fixed charge, which is modest and far below actual fixed costs", he found that non-CARE customers would see an increase of about $4/month in their bills; the

[4] "Regional and Income Distribution Effects of Alternative Retail Electricity Tariffs", Borenstein, WP 225, October 2011.

impact would be on lower-income non-CARE customers.[5] Among the lowest-income non-CARE customers, "introducing a fixed monthly charge would on average cause a net increase in their bills of between 69% and 92% of the fixed charge."[6] This would be $4-5 for a $5/month charge.

Borenstein also found that there would be a small regional impact of introducing a fixed charge.

> I find that the regional impact of introducing a fixed charge is, on average, a slight bill decrease to customers in inland areas and a slight increase to coastal customers. The reason is that while the fixed charge imposes the same cost on all customers, the lower marginal price on higher tiers benefits inland customers more because they consume more kilowatt-hours (kWh) – though not a higher proportion of their kWh – on the higher tiers. [7]

Allegations are made that fixed charges increase revenue stability but create less incentive for energy efficiency (EE) or adding solar PV distributed generation; it is argued that adding fixed charges reduces variable charges that can be avoided through EE or PV. In reality, rolling fixed costs into volumetric rates simply shifts these costs to larger users, although they are not responsible for them. Facing prices above cost does not lead to economically efficient decisionmaking. The issue is sending correct price signals as to the cost of consumption. Minimum bills do not solve the problem, because they are not designed to recover both the fixed costs and the initial variable costs. They just hide the subsidy.

Interestingly, investor-owned utility (IOU) fixed charges in California are much lower than fixed charges for customers of publicly-owned utilities (POUs).

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5 Op cit, at 13 and at 16.
6 Op cit, at 17.
7 Op cit, at 2.

It is unclear why there should be so much argument over a $2-5/month fixed charge when POU fixed charges are much higher. Glendale's residential customer charge is $8 for regular service and $1/day for residential TOU. Pasadena's fixed charges increase with kWh usage and are $30 for 500 kWh per month. SMUD is increasing its fixed charges, called System Infrastructure Fixed Charges, from $12 to $20 per month by 2017. SMUD has a very high customer satisfaction rating, which has exceeded 95% for the past decade, which suggests that its fixed charges are not a matter of significant concern.[8]

2. Demand Charges

Demand charges represent a legitimate way to recover fixed costs and are used in all rate schedules except for small commercial, residential, and special schedules encouraging electric buses and some renewable distributed generation. These exceptions generally represent a cost shift to other customers in the relevant class, unless the recovery of these fixed costs in volumetric rates recovers the same amount that would be recovered from a fixed charge. However, if fixed customer charges are confusing for residential customers of IOUs, demand charges for the residential class are likely to be more confusing.

If these fixed costs are not recovered in demand charges, they should be recovered in ways that assign their recovery to the appropriate time periods and levels of use. Similarly to non-residential customers, fixed generation capacity costs should be recovered from residential customers in time-related energy charges. Fixed distribution costs should either be recovered on a volumetric

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[8] 2013 GM Rate Report Vol. 1, at 67.

basis by TOU or for all usage if not by TOU. This will still impose greater costs on larger users, but a declining block rate structure for distribution cost recovery is politically unlikely and could actually create confusion after so many years of increasing block rates.

3. Volumetric Charges

Volumetric charges should send proper price signals in terms of the costs of serving customers, including residential customers. The variable costs of providing service change hourly (even sub-hourly). They also differ by TOU and season. The fixed generation-related costs vary with hourly loss of load expectation but, absent real-time pricing (RTP), this cannot be captured in volumetric charges. Critically, the timing of recovery of these the costs, to the greatest extent possible, should match the timing of cost incurrence, even if there is some level of inevitable averaging.

There are three standard types of volumetric charges, flat rates, tiered rates (aka increasing block rates), or TOU rates. Dynamic “event” rates may be added to these rates.

a. Tiered (Increasing Block Pricing) Rates

Tiered rates represent the current rate design required by statute. Current tiered rates start with a baseline block whose quantity is set at 50-60% of average usage in the customer’s climate zone. The second tier is set for over 100% up to 130% of the baseline quantity. The third tier is set for over 130% up to 200% of the baseline quantity. The fourth tier is set at over 200% of the baseline quantity.

The arguments for tiered rates are encouragement of EE when customers face higher rates for higher tiers and assistance for low income or smaller users who see lower rates in the first two tiers. The EE claims are theoretical arguments based on assumptions of price elasticity of demand in response to marginal prices. The classic arguments that increasing block rates promotes EE are found, for example, in Ahmad Faruqui's article "Inclining Toward Efficiency". [9] These are premised on the concept that customers respond to marginal prices. There is no evidence, however, to support this claim and it should be rejected.

Indeed, there is virtually no empirical work on the impact of tiered rates on customer usage. The two exceptions are studies by Severin Borenstein and Koichiro Ito. Their results refute the arguments for tiered rates.

Borenstein has concluded that "differential pricing under increasing block rates has no cost basis" and that it has "minimal impact on total consumption."[10] He based the latter conclusion on preliminary work by Ito.

The arguments that increasing block rates provides incentives for EE are based on the assumption that customers know when their usage crosses tiers and display price elasticity of response to the higher rates for the higher tiers. Ito's study indicates that customers do not pay attention to the marginal price at each tier but rather respond to the average price they pay.[11] Ito constructed a multi-part empirical test in which he studied electricity use for consumers in the same location served by two utilities with different increasing block rate

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9 Public Utilities Fortnightly, August 2008.

10 Borenstein, WP 229, at 14.

11 "Do Consumers Respond to Marginal or Average Price? Evidence from Nonlinear Electricity Pricing" Koichiro Ito, Haas WP 210R, October 2012.

structures. Using extensive multi-year data, he provides “strong evidence that consumers respond to average prices rather than marginal or expected marginal price.”[12]

If this is the case, this empirical evidence does not support assumptions that customers respond to marginal prices and that increasing block rates provides conservation effects. Indeed, Ito shows that:

> the sub-optimal response makes nonlinear pricing unsuccessful in achieving its policy goal of energy conservation…[N]onlinear tariffs may result in a slight *increase* in aggregate consumption compared with an alternative flat marginal rate if customers respond to average prices.[13]

If customers respond to average, rather than marginal price, increasing block rates provides no EE incentive. Moreover, as for the impact of increasing block rates on low-income customers, Borenstein concludes means tested programs have less dead weight than tiered rates.[14]

If the intention of increasing block rates is to help low-income customers, means-tested programs work is more economically efficient if marginal costs are near average cost.[15] In summary, to quote Borenstein:

> Numerous analyses have estimated demand elasticity on the assumption that customers respond to the marginal price that they face, but it seems likely that the vast majority of customers in California not only do not know what tier their consumptions puts them on, but even that the rate structure is tiered at all. In that case, the response to increasing-block pricing is likely to be more muted, possibly much more muted. Customers might respond to some inference about the average price they have paid over the prior few billing periods rather than the precise marginal price that they

[12] Ito, WP 210R, at 2.
[13] *Id*, at 3.
[14] “The Redistributional Impact of Non-Linear Electricity Pricing”, Severin Borenstein, NBER Working Paper 15822, at 36.
[15] *Id*.

> face.[16]
>
> and
>
> [I]f reducing the electricity bills of low income customers is a major public policy goal it may be pursued more effectively with an income-based approach such as the CARE program, rather than the less-direct steeply-tiered retail tariff.[17]

He also concludes that increasing block rates only "*increases* the efficiency cost when the social marginal cost of electricity is substantially high because of negative environmental externalities from electricity generation."[18]

Tiered rates also have flaws from a cost-of-service perspective. Tiered rates fail to recover fixed costs or variable costs in the time periods they are incurred. Thus they fail on cost causation. They send incorrect price signals. Smaller users have less incentive to conserve. They provide no price signals as to when the incremental costs to serve load are high or when the system would benefit from reduced load. Large users pay disproportionate rates compared to costs at the margin. Increasing block rates are inefficient -- the marginal cost of one more unit of consumption is not much higher for the one kWh that puts a customer in a higher tier.[19] Tiered rates provide no incentive for load-shifting like pre-cooling or reducing loads on over-loaded substations. Tiered rates provide no indication of temperature-driven system costs or local loading or to decrease usage during evening peaks.

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16 "Equity Effects of Increasing-Block Electricity Pricing," Severin Borenstein, WP 180, November 2008, at 25-26.

17 Borenstein, WP 180, at 24-25.

18 *Id*., at 3-4.

19 *See* "Efficient Retail Pricing in Electricity and Natural Gas Markets: A Familiar Problem with New Challenges", Steven L. Puller and Jeremy West, at 9 (January 2013).

And, last but not least, tiered rates provide their greatest signals at the end of a billing period, regardless of cost. We recognize that the utilities are considering Tier Alerts now that customers have Advanced Metering Infrastructure (AMI). However, there is no evidence at present as to how customers will respond to such alerts. They cannot stop consuming for the rest of the month.

Another argument is that increasing block rates makes investments in PV more appealing, since the PV installations are often sized to offset only usage on the higher, more-expensive, tiers. It may provide an incentive for PV because PV marketers depend on an analysis of rates at higher tiers, combined with the impact of Net Energy Metering (NEM), to make the case for PV. Any discussion of the merits (or subsidies) associated with NEM should be informed by the pending study on NEM costs and benefits. That stated, making PV look good is not a valid reason for a rate design. It has nothing to do with economic efficiency. There is no evidence that the higher tiers recover only cost -- indeed they recover more than cost of service, so this argument in fact is for a subsidy for PV.

Concerns have been raised that increasing block rates disadvantages residential electricity consumers in more extreme climate zones. However, the structure of baseline sets the first tier at 50-60% of average usage by climate zone. Accordingly, Borenstein found that increasing block rates does not discriminate against customers in more extreme climate zones in terms of average bills paid, although they would see small benefits from less steeply inclined rates.[20]

b. Time of Use Rates

TOU rates vary by season and with different hours of the day.[21] The higher rates in peak periods reflect the higher marginal costs to serve customers during these periods. Both two-period and three-period TOU rates are common and most non-residential customers are served on TOU rates.[22] The length of the peak period can vary widely. For example, SMUD has a three-hour peak from 4-7 pm, whereas Arizona Public Service (APS) has two TOU options, one with a 12-hour peak (9 am to 9 pm) and one with a 7-hour peak (noon to 7 pm). Clearly shorter peaks are easier to avoid. Most utilities do not have peak hours on weekends. TOU rates also often vary by season, with afternoon summer peaks and evening winter peaks.

i. Non-California TOU Examples

Toronto Hydro has introduced mandatory TOU for residential customers and has received some negative feedback due to bill impacts. We do not have enough information on how the program was rolled out and the type of customer education that was used to be able to fully evaluate the reasons for this feedback. One issue may be the size of the TOU peak period, which is 11 am to 5 pm in the summer and 7-11 am and 5-7 pm in the winter. However the TOU ratio peak to off-peak is only 2:1.

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[20] Borenstein, WP 225, at 17.

[21] *See* ALJ Ruling, Attachment D, at D6.

[22] Large commercial and industrial customers in California have had default TOU rate for decades.

Arizona Public Service has voluntary TOU for residential customers. Over 50% of its residential customers are on this voluntary TOU rate.[23] Large users avoid the upper increasing block rates tier in the default rate by choosing TOU. In marketing the program, APS encourages customers to participate if they are not home during day, can shift use of appliances, and can change their thermostats during the peak period. APS offers two TOU plans: an on-peak period from 9 am to 9 pm and one from noon-7 pm, weekdays only. It is interesting that these programs are very successful on an opt-in basis, since the TOU peak periods are quite long.

The Salt River Project (SRP), a publicly-owned utility in Arizona, also has a voluntary TOU rate option. About 30% of its residential customers are on this voluntary TOU rate. SRP saw a 20% increase in opt-in with AMI and measurable peak load reductions. It expects bigger relative load reductions for AMI-enabled TOU with programmable communicating thermostats.[24]

ii. California TOU Examples

California utilities have optional TOU rates for residential customers. Customer adoption is limited and, at least for the IOUs, is dominated by customers with PV to take advantage of NEM offsets of output by time of day.

PG&E had an optional E-7 TOU rate that is now closed to new customers. Historically it showed statistically significant load reductions in summer (with NEM use excluded) but on average the reductions were less than those

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23 "IOU TOU Where are those time-of-use rates?" Kathleen Wolf Davis, Energy Central, (February 25, 2013).

24 "Salt River Project: Delivering Leadership on Smarter Technology & Rates", Vermont Law School, Institute for Energy and the Environment (June 2012).

occurring with PG&E's dynamic critical peak pricing (CPP) option called "SmartRate".[25] Similarly, non–NEM E-6 and E-7 TOU customers had statistically significant load reductions in 2012.[26]

Notably, SMUD is now proposing to eliminate its current two-tier increasing block rates rate by 2017; SMUD is moving to a flat rate and then introducing residential TOU for all customers, making TOU the default rate by 2018.[27] SMUD proposes to achieve tier convergence by increasing the rate of the first residential tier each year and then dropping the second tier rate to the level of the first tier in 2017.[28]

Proposed Summer Tier Convergence With Rate Increase

Period		2013	2014	2015	2016	2017
	SIFC:	$12.00	$14.00	$16.00	$18.00	$20.00
Summer Prices	Base Use	$0.0989	$0.1033	$0.1076	$0.1142	$0.1215
	Base Plus	$0.1803	$0.1836	$0.1870	$0.1870	$0.1215
	Difference	*$0.0814*	*$0.0803*	*$0.0794*	*$0.0728*	*$0.0000*
Summer Base Allowance	Standard	700	765	835	1,100	All kWh
	Well	1,000	1,065	1,135	1,400	

25 2011 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs, FSC Corp, at 3-4.

26 2012 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs, FSC Group, at 67-70.

27 General Manager's Report and Recommendation on Rate and Services, May 2, 2013, Vol. 1. at 14.

28 Op. cit., at 18-19.

Proposed Winter Tier Convergence With Rate Increase

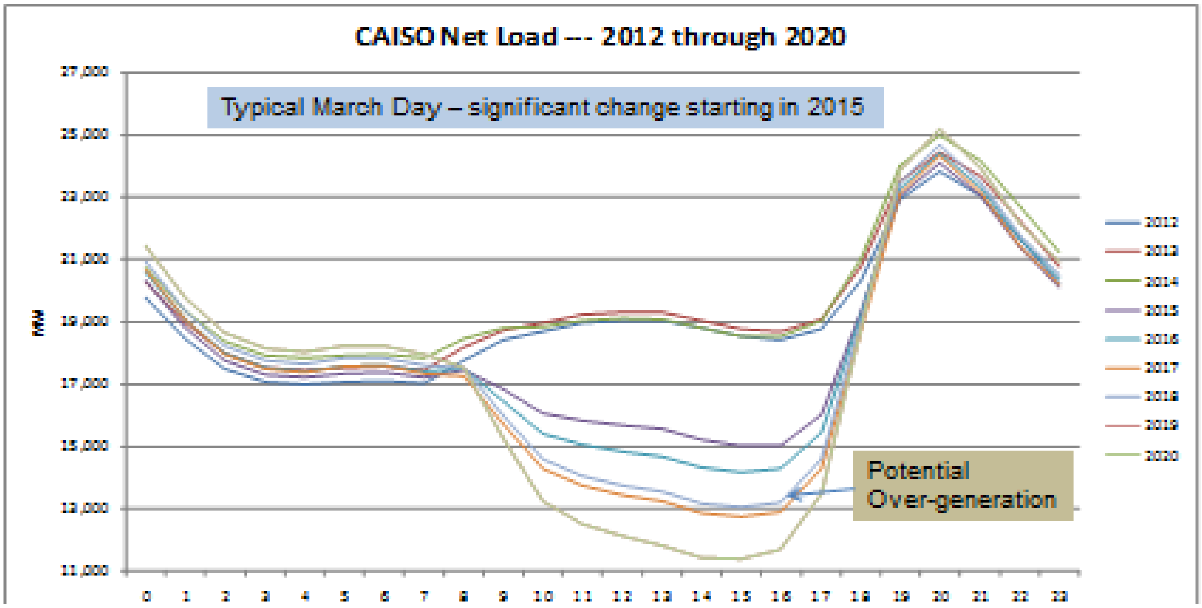
Period	Charge	2013	2014	2015	2016	2017
Monthly	Svc Chg	$12.00	$14.00	$16.00	$18.00	$20.00
Winter and Spring-Fall Prices	Base Use	$0.0911	$0.0955	$0.0998	$0.1036	$0.1080
	Base Plus	$0.1738	$0.1771	$0.1805	$0.1805	$0.1080
	Difference	*$0.0827*	*$0.0816*	*$0.0807*	*$0.0769*	*$0.0000*
Winter Base Allowance	Standard (Gas Heat)	620	690	770	1,000	All kWh
	Standard Gas w Well	920	990	1,070	1,300	
	Electric Heat	1,120	1,280	1,500	3,000	
	Electric Heat w Well	1,420	1,580	1,800	3,000	
Spring-Fall Base Allowance	Std Gas	620	690	770	1,000	All kWh
	Well Gas	920	990	1,070	1,300	
	Std Elec	800	920	1,100	3,000	
	Well Elec	1,100	1,220	1,400	3,000	

While this proposal has not been adopted yet, SMUD's argument for the change is that 75% of its residential customers are paying less than its cost to serve them.[29] SMUD has had very good results from its Residential Summer Solutions Study during 2011 and 2012, which combined TOU rates with dynamic "event"-based rates. This pilot is discussed in greater detail under the section on dynamic pricing below. It appears that SMUD's positive experience with this pilot provided the impetus for this proposed change in rate design. SMUD's high customer satisfaction rate with the program strongly suggests that such a rate change away from tiered rates and toward TOU rates, if introduced with good customer education, can be successful in affecting residential usage, reducing bills, and even increasing energy efficiency of residential customers. SMUD also has a relatively short peak period (4-7 pm), which makes it easier for customers to respond by adjusting load in that period.

[29] Op. cit., at 15.

Palo Alto's TOU pilot combines tiers plus TOU, *i.e.* there is an on-peak adder and off-peak subtractor for tiered rates. SMUD had TOU plus two tiers plus CPP as part of its Residential Summer Solutions program (discussed under dynamic rates) but, despite the success of this rate in its pilot, is proposing to eliminate its tiers, as mentioned above, and to move to TOU rates. TOU rates that include tiers are certainly more complex to explain to customers.

Historically, TOU time periods for optional rates have been fixed, sometimes for long periods of time. The summer peak period has been 11 am or noon to 6 pm for decades for the California IOUs. However, the CAISO forecasts changing load shapes in the future. The CAISO forecasts what it calls "net load", which is load net of intermittent renewable generation. With a large increase in solar PV output, both on a central station and distributed basis, the CAISO forecasts a substantial "net load" reduction in the afternoons and a steep ramp in the evenings as PV output falls. The following diagram is from a CAISO presentation at a Long Term Procurement Plan workshop on April 24, 2013.



While this diagram is for March, the CAISO also predicts a morning peak, then lower loads during the afternoon in the summer, followed by significant late afternoon and evening ramps. With such changes, the TOU periods are likely to shift, with the peak moving into the evening hours all year, not just in the winter (for those utilities that have a winter peak, like San Diego Gas & Electric Company).

The summer peak period for PG&E and SCE has been fixed for decades. Even though few residential customers are on TOU rates, they have heard Flex Alerts and other announcements that usage should be avoided on hot summer afternoons. Customers have some understanding that energy demands vary with TOU. Thus they understand the concept of avoiding the peak if there is a connection with temperature. There will need to be a focused effort to communicate a different peak period to them.

If the Commission is to encourage more residential TOU rates, and if the peak will be shifting to late afternoon and evening, a lot of customer education will be required to help customers shift usage from late afternoons and evenings. SMUD's 4-7 pm peak shows that such an evening period can be effectively communicated to customers. In addition, having a peak when people come home from work and school should prompt development of strategies to mitigate the discomfort, *e.g.* through incentives for pre-cooling or other load shifting.

The downside of TOU rates is that there are generally rigid time periods, changing only by season. Some dynamic aspect should be incorporated to address events when load reductions or shifting are beneficial as well, *i.e.* "event" periods with much higher prices when load can be discouraged.

There is evidence from SMUD that customers who shift load out of the peak period will do so even when there is not a dynamic pricing event.

> Overall energy impacts were strongly correlated with Non-event and Event Peak impacts – meaning that those who shifted loads out of the peak period were also more likely to save energy overall. Likewise, Non-event Peak impacts were strongly correlated with Event Peak impacts – meaning that those who shifted loads out of the peak period every day were also more likely to shift loads out of the peak period on event days.[30]

Clearly, TOU rates can support PV (especially with NEM) and Electric Vehicle charging, but will only do so correctly if the time periods are set properly. Current summer afternoon TOU peak periods overlap with PV output, but as the peaks shift later, this will be less the case. It is not appropriate to grandfather customers with PV if the peak shifts to evening, because this could stimulate more use at the wrong time. If there is a concern about changing the current

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[30] SMUD's Residential Summer Solutions Study, 2011-2012, Karen Herter, at 40.

residential TOU rates and the impact of a later peak on current PV customers, it would be better to come up with a solution that does not encourage usage during the evening that increases the system peak. Lastly, TOU rates, like dynamic pricing, increase the value of AMI.

c. Flat Rates

Flat rates are simplest to understand and avoid the price distortion of tiering, but have many limitations. The Commission should thus transition residential customers away from flat rates. Since costs vary by hour and season, flat rates clearly involve cross-subsidies from customers whose usage falls in lower-cost hours to those whose usage falls in higher-cost hours. Also, since flat rates do not mirror the variability of costs, they implicitly include a hedge premium.

Another problem is that flat rates offer no ability for customers to benefit when they shift load to lower-cost hours. "Customers on flat rates are protected from price volatility but give up ability to reduce bills by shifting consumptions across hours."[31]

Flat rates clearly do not provide accurate price signals. Customers on flat rates have no incentive to help reduce system costs by shifting load when system costs increase. If flat rates were adopted, there is evidence that average bills by geographical region would not change very much, although lower users would see higher bills and vice versa.[32]

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31 Borenstein, WP 229, at 9.

32 "Switching to a flat retail price for all power would have essentially no redistributive impact across regions." Borenstein, WP 225, at 9; *see also Id.*, at 8.

Some price signal could be achieved with flat rates if there were price adders and subtractors (i.e. a dynamic overlay) for periods where system load should be increased or decreased, e.g. to mitigate overgeneration or steep ramps. These adders and subtractors could change by season or more often through customer communication and AMI. However, if the need for load shifting away from an evening peak was sufficiently consistent, it would be more straightforward to have a TOU rate with evening peak period, even a relatively short one like SMUD's brief evening peak period.

d. Dynamic Rates

Dynamic rates refer to rates that change significantly for certain pre-defined "event" periods, such as periods of high loads, high wholesale prices, or reliability concerns.[33] The term is generally used to refer to CPP rates or peak time rebate (PTR) rates.[34] The number of events is usually limited across the year and usually signaled on a day-ahead basis. The prices for the events are generally much higher than normal rates, usually ranging from 60 cents/kWh to over $1/kWh. Event periods vary, but tend to range from 3 to 7 hours, depending on the utility.

Dynamic rates provide clear signals of when the costs of serving customers are significantly higher or lower as well as when it would be desirable for load to increase or decrease for system reasons. Dynamic pricing can be

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33 *See* ALJ Ruling, at Attachment D, at D6 (defining Dynamic Rate as "a rate in which prices can be adjusted on short notice (typically an hour or day ahead) as a function of system conditions.").

34 These comments will not address the relative merits of CPP vs. PTR, a matter which has been considered elsewhere by the Commission, except to state that the baseline issue for PTR is a serious problem.

used to signal a need for load reductions at times of high cost or potential supply shortages. Dynamic pricing also has significant potential for load-leveling to avoid large ramps.[35]

There have been many assertions that customers do not want dynamic rates or that they will be punitive. It is more correct to say that customers have inertia when it comes to changing rates and fear higher bills. Customer inertia was discussed in context of the Residential Rate Design Rulemaking Customer Survey. Ninety percent of customers were willing to consider another rate plan but only 50% were willing to switch if there was a risk of a higher bill.[36]

It is also incorrect to assume that residential customers are not interested in dynamic pricing. SMUD found that customers were very enthusiastic about switching from tiered rates to its dynamic residential rates. Its 2011-2012 SMUD Residential Summer Solutions Study refers to "the overwhelming preference for the dynamic Summer Solutions rate over the standard tiered rate".[37]

PG&E's SmartRate program is a dynamic pricing overlay to PG&E's existing residential rates. "The [SmartRate] program underwent significant expansion in 2012. Approximately 21,000 customers were enrolled at the end of 2011; approximately 37,000 were enrolled for the first event on July 9, 2012; and approximately 78,000 were enrolled for the last event on October 3, 2012."[38] A significant fraction of the load on SmartRate was also on SmartAC, an air conditioner load control program. Customers with air conditioning provided

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[35] *See* "The Future of the Electric Grid: An Interdisciplinary MIT Study," at 161-170 (2011).
[36] Supplemental Q A from 04/19/2013 Webinar C, at 3-4.
[37] Herter, 2011-2012, at 44.
[38] 2012 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs, FSC Group, at 1.

larger load reductions. The vast majority of customers who sign up for SmartRate stay on the program. Attrition due to de-enrollment is quite low (less than 1%).[39] Given the number of customers on these rates, it is surprising that they have received so little attention.

Dynamic rates allow customers to lower their bills and even increase EE, as demonstrated in numerous studies, including those cited below. In addition, there is a large amount of evidence that the use of automation increases customer load response to dynamic rates. Interestingly, there is also significant evidence that the customer load response is better if the customer has the ability to determine the level of the automated load response and even to override its own automation.

Furthermore, dynamic pricing affects loads during event *and non-event* periods and does even better with enabling technology. A recent study for SMUD provides evidence of all of these effects:

> On average, energy and demand savings were greatest for the group of participants on the experimental TOU-CPP rate *who controlled their own thermostat automation settings.* Average energy savings for this group were 58% during events, 33% during normal weekday peak periods, and 9.5% overall.
>
> Similar but slightly lower savings were attained by the group of participants on the experimental TOU---CPP rate *who allowed SMUD to control their thermostat during events.* For this group, average energy savings were 56% during events, 26% during normal weekday peak periods, and 7.9% overall.
>
> Significantly lower impacts were found for participants on the standard rate who allowed SMUD to control their thermostat during events. For this group, average energy savings were 34% during events, 5.0% during normal weekday peak periods, and 5.0% overall. Because these customers were paid $4 per event, however, their overall financial benefit

39 *Id*., at 2.

was slightly higher than those on the rate alone, implying that dynamic pricing programs without direct load control payments have the potential to provide utilities with a higher benefit at a lower cost.

Finally, participants who were on the standard rate and controlled their own thermostat automation settings were least responsive, with just 8.0% event savings, 0.7% weekday peak savings, and 4.3% overall savings.[40]

Enabling technology is often discussed in the context of dynamic pricing. However, there are two different types of enabling technology: those providing customer information and those providing automated response. Those providing automated response are much more successful, such as PCTs and auto-Demand Response.[41] The evidence on the benefits of technology that only provides customers with information is more mixed. The SMUD study found that there were some savings in energy and demand for customers with real-time energy monitors but that these were far lower than those for customers with PCTs. Other studies have found some or no benefit from such technology.

Several studies show benefits of allowing customers to determine their own pre-programmed load changes and to be able to override their own settings on occasion. There is some evidence that customers with enabling technology like PCTs respond better to dynamic rates if they have control over their loads (e.g. they can override set points or pre-set themselves), and respond less well when there is third-party (e.g. utility) control of their appliances. The Herter study just cited shows a small improvement in energy and demand savings for customers controlling their own responses compared to those with utility-controlled devices for dynamic pricing events but a much larger improvement

40 Herter, 2011-2012, at 47.
41 *See, e.g.*, Herter, 2011-2012, at 2.

during non-event peak periods. This may be a somewhat counter-intuitive result. However, one possible explanation is that those customers who decided how their PCTs would respond to events and price signals are better informed and interested in controlling their own energy use. The Brattle study in Michigan found that PCTs which were easy to override did not increase substitution elasticity but did increase daily price elasticity.[42] This result could also imply that customers who determine their own levels of response are more price-sensitive.

Customer control may lead to better customer acceptance of dynamic rates. Furthermore, customer control could avoid the possibility of a negative reaction, such as the opposition to smart meters by IOU customers at this Commission and to a requirement for new PCTs for new homes at the California Energy Commission several years ago.

The SMUD study also showed that customers on dynamic rates saved significantly more demand and energy than those on direct load control without the rate option.

> Participants on the Summer Solutions Rate saved significantly more energy and demand than did those on the load control program. During events, participants on the Summer Solutions rate dropped 70% more load during peak events than did those on the ATC-only load control option.[43]

The SMUD study found that real-time home energy information enhanced energy and peak savings but not response to events. Other studies have found the impact from real-time home energy information without dynamic rates is far

[42] "Dynamic pricing of electricity for residential customers: the evidence from Michigan", Faruqui, Sergeci and Akaba, at 17.
[43] Herter, SMUD Residential Summer Solutions Study, 2011-2012, at 3.

smaller than for customers with dynamic rates.[44] However, a recent study found that customers with real-time information about their energy consumption showed substantially more price elasticity of demand during dynamic pricing events when those customers were without automated response technology.[45] This study contradicts the results of other studies.

The results of all of these studies indicate that enabling technology makes a difference in customer response. Automated response technology like PCTs has been shown on many occasions to make a large difference in customer response to dynamic pricing events. Real-time information on usage has a smaller impact than automated response technology but shows some effect. Our initial conclusion is consistent with that of Herter in the 2011-2012 SMUD Residential Summer Solutions Study. It is better to focus resources on advanced thermostats and customer education than on in-home devices providing real-time energy information.[46]

Dynamic rates levels should be set to be revenue neutral on the assumption that all customers opt in, assuming no price elasticity.[47] If customers with less peaky loads gravitate to dynamic rates, thereby reducing their bills, and if there is a revenue shortfall, the shortfall should be allocated to customers on non-dynamic rates, because the lower bills for opt-in customers should be concurrent with a reduction in the costs to serve them. There are no studies of residential opt-out dynamic rates; Borenstein's proposal that residential dynamic

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[44] "Dynamic pricing of electricity for residential customers: the evidence from Michigan", Faruqui, Sergeci and Akaba, at 20.

[45] Jessoe and Rapson, WP 241, April 2013.

[46] Op, cit., at 49.

[47] Borenstein, WP 229, at 15.

pricing be approached on an opt-in basis makes sense, especially if residential TOU rates are to become the default.

One way to facilitate customer interest in dynamic pricing is to use shadow billing, as proposed by Borenstein.[48] As noted above, the Residential Rate Design customer survey shows customers are reluctant to change rate schedules even when they can benefit. Shadow billing provides information to customers about the savings they would have achieved if they had been on dynamic rates. It also shows where they would not have benefited and could provide impetus to make a change. It is more customer-friendly than bill protection for one year. Borenstein suggests it be used to provide information on the last 12-month ending period. If this can be accomplished in a cost-effective manner, this would be the most useful information for a customer to have.

There is evidence that the customers who participate in dynamic pricing like it. "94% of survey respondents rated their satisfaction with the program as Good or Excellent."[49] PowerCentsDC found that "[o]ver 74% of participants were satisfied with the program and only 6% were dissatisfied. Over 93% of participants who expressed a preference preferred PowerCentsDC over Pepco's default standard offer service pricing. About 89% of participants would recommend PowerCentsDC to their friends and family."[50] "Baltimore Gas and Electric's surveys among customers in its Smart Energy Pricing pilot found that 92 percent of the customers in 2008, 93 percent of the customers in 2009, and 93 percent again in 2010 reported that they were satisfied with the program.

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48 Borenstein, WP 229, at 10.
49 Herter, 2011-2012 SMUD Summer Solutions, at 3.
50 "PowerCentsDC Final Report", September 2010, at 6.

Furthermore, 98 percent, 99 percent, and 97 percent, respectively, were interested in returning to a similar pricing structure the following year."[51]

Dynamic pricing also shows high retention and persistence rates.

> [t]he SEP customers were *more* price-responsive in the summer of 2009 compared to the summer of 2008 even though the weather conditions were milder in the summer of 2009. SEP 2009 elasticities would have been much higher if the summer 2008 weather conditions held true for the summer of 2009. This is to say that the SEP customers displayed persistence in their price-responsiveness in the second year of the pilot program. In fact, not only did they sustain their price responsiveness, they also increased it as compared to the first year of the pilot program, suggesting that a learning or habit formation process may have been at work.[52]

PG&E's SmartRate was studied for 4 years. It shows high retention rates and persistence as well.[53] PG&E's SmartRate dis-enrollments were only 1% in 2012, demonstrating strong persistence of participation.[54]

There were similar results from Gulf Power's Energy Select CPP program.

> "Energy *Select* participants pay a lower price for electricity 87 percent of the time. This is likely the reason that surveys on customer value show that Energy *Select* participants rate "control of energy usage/pricing" as a "High Value." And 87% report that the program improves their satisfaction with Gulf Power. Furthermore, 89% of participants say they are satisfied or very satisfied with their savings on their electric bills."[55]

Dynamic pricing can work for low-income customers as well. Borenstein found very little systematic relationship between household income and the

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51 "Dynamic Pricing and its Discontents", Faruqui and Palmer, *Regulation,* Cato Institute, at 21.

52 "The Econometrics of Dynamic Pricing in a Mid-Atlantic Experiment" Faruqui and Sergici, February 2010.

53 2011 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs, FSC Corp.

54 2012 Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-based Pricing Programs, FSC Group, at 51-53.

55 Comverge, an Intelligent Energy Case Study: Gulf Power.

impact of CPP.[56] Notably, the peakiness of low income customers is not very different from other customers.[57] Borenstein concluded that low usage customers consume a smaller share on power on-peak and benefit from CPP.[58]

The Michigan dynamic pricing pilot showed substitution elasticities for CPP and PTR that were indistinguishable among income groups.[59] PowerCentsDC found benefits for low income customers. "Limited Income customers signed up at higher rates than others, reduced peak very slightly less than others, and saved money on the program."[60]

A recent study in Japan found economic incentives provided through dynamic pricing resulted in more load shifting than conservation warnings if customers are well-informed about price changes day-ahead.[61] Higher hourly marginal prices produced more load response, although at a diminishing rate. The Japan study also showed that the effect of a conservation warning was greater for high-income households but that there was a larger effect of dynamic pricing for low-income households.[62] There was a larger response from large users and those with older air conditioning equipment. A key finding was that despite high prices during CPP events, bills paid by over 75% of the treatment

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56 Borenstein, WP 229, at 23.
57 *Id*., at 16.
58 *Id*., at 21
59 "Dynamic pricing of electricity for residential customers: the evidence from Michigan", Faruqui, Sergeci and Akaba, at 19.
60 PowerCentsDC Final Report, September 2010, at 5.
61 *See* "Using Dynamic Electricity Pricing to Address Energy Crises Evidence from Randomized Field Experiments", Takanori Ida, Koichiro Ito, Makato Tanaka, March 2013.
62 *Id*., at 12. This result differs somewhat from other studies showing a smaller, but real, ability of low-income customers to reduce their loads in response to dynamic pricing signals, as discussed below.

group were less than counterfactual bills under a revenue-neutral TOU pricing schedule.[63]

Most studies show that low-income customers do not have as great a potential for load response as higher-income customers, but this does not mean that they have no potential. Furthermore, dynamic pricing is not a substitute for other types of assistance programs for low-income customers. However, these assistance programs have historically resulted in rate designs like CARE that price power below cost and send minimal price signals to low-income customers about when it costs more or provides more or less benefit for them to adjust their loads. There is no reason why low-income assistance cannot be provided in a way that still allows price signals to be sent while also allowing low-income customers to benefit from load-shifting where possible.

A regular concern about dynamic pricing is that it can lead to bill volatility. Months with dynamic pricing events will have higher bills unless customers respond to those events. These months have historically been most likely to occur during the summer. Concerns about bill volatility could be addressed through levelized payment schemes, but these can also confuse price signals to customers. A better proposal has been made by Severin Borenstein, which he called SnapCredits.[64] SnapCredits would allow customers to manage the

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63 *Id*., at 14.

64 Borenstein, WP 229, at 13-14. ("An alternative plan might be able to capture the payment smoothing without losing the bill salience. Rather than an automatic bill smoothing, this approach, which I will call a "SnapCredit" plan, would kick in only if a customer had an unusually high bill. Essentially, a SnapCredit plan would automatically offer to allow the customer to defer paying the unusually high component of the bill. The deferred payment would then be spread over the next 6 or 12 months. Each month the customer would still receive a bill for the energy consumed that month, which indicates the cost that will eventually have to be paid. But if the bill were more than a certain amount above the expected bill for that month (using basically the same

variations in their bills that are possible from dynamic pricing but still see the dynamic pricing signals, which are the central feature of this rate design. The downside of levelized payment schemes is that they can mask price signals.

4. Low Income/Medical Subsidies

The state has a policy of providing "affordable" electricity to customers with low incomes and with medical conditions. For the purposes of this discussion, we will use the term "low-income" to cover both categories of customers, although we acknowledge that they are different. The term "affordable" is open to broad interpretation. However, for present purposes, there are two issues:

1) whether rate design is the right way to provide assistance and

2) if so, whether the current program that provides such assistance through below-cost rates is the right type of rate design to use.

Ideally, support for low-income electricity consumers would come outside of rate design through taxpayer-supported assistance programs. This support would then not vary between IOU and POU customers, as it does today. Indeed, we note that POUs generally provide more limited low-income assistance than the IOUs, and often place caps on the level of assistance.

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tools currently used to calculate expected bills for plans like Level Pay), the bill would include an offer of the SnapCredit option to pay only the expected amount and to have the remainder spread out over some number of months in the future. The utility could charge interest or not, though most Level Pay plans do not charge interest.

Like the Level Pay plans, the SnapCredit plan would help consumers who are surprised by a higher-than-expected bill in one month and do not have the financial cushion to manage the shock. Unlike the Level Pay plan, this would not create a general cognitive disconnect between consumption and payment. The full bill would still be presented as the default payment, so the customer's attention would still be focused first on that liability. But the consumer would have the option to spread out payments on the component of the bill that is higher than expected.")

If such assistance is to continue to be provided through electric rates, its implementation should be consistent with other Commission policies which currently it is not. The Commission is concerned about providing carbon price signals through electric rates and promoting energy efficiency; there is a policy mismatch in providing power to low-income customers at prices well below cost that include no carbon price signal. These below-cost rates provide no price signals for energy efficiency. The Commission has decided to return revenue from the sale of free carbon allowances to residential customers through a separate rebate (the "Climate Dividend") that does not mask the carbon price signal. Similarly, any assistance to low-income customers should not hide the actual cost of electricity from consumers, regardless of income.

The current CARE program should be restructured because it incorporates the flawed increasing block rates price structure, provides power below cost, and sends incorrect price signals as to the cost of electricity to participating consumers. At a minimum, any assistance should be provided as a separate line item on the bill that avoids masking the cost of power for residential customers. CARE customers should also be transitioned to a TOU rate structure with a dynamic pricing option, like other customers.

SMUD's low-income rate has a smaller fixed charge than its regular rate, a declining percentage discount off its two-tier regular rate, and a maximum dollar discount each month. As part of the transition to TOU + CPP rates, SMUD proposes to increase the percentage discount for that period of time but decrease the maximum dollar discount. SMUD's analysis indicates that half of its customers will see no bill impact from this change, 35-40% will see lower bills, and only the highest users (over 1100 kWh per month) will see higher bills. The latter will be eligible for special energy efficiency programs.

B. Transition Period and Customer Education

Clearly there will be a need for a transition period if the Commission makes significant changes in residential rate design. We have noted that SMUD's proposed change from a two-tier increasing block rates rate structure is proposed to take place over a five-year period. A transition for the IOUs could likewise take place over 4-5 years, but the clear direction should be that the final rate design will be TOU with optional dynamic pricing. In the interim, TOU and dynamic pricing rate options should be available for residential customers, with the rates set initially on a revenue neutral basis. If customers on these rate schedules demonstrate a lower cost of service, the revenue requirement for the rate schedules should reflect these lower costs. Any shortfall should be recovered from customers on the default rate schedules.

A major, well-designed, customer information and education program should be undertaken to prepare customers for these changes and to inform them of the possible benefits of TOU and dynamic rates, depending on their usage patterns. The utilities should be directed to provide shadow billing for TOU and dynamic rates within two years of the start of the transition or earlier, if possible, so that customers who can benefit will receive that information.

V. Responses to Questions for Rate Design Proposal

The questions from the ALJ Ruling are italicized below, with either a brief response or a reference to the section(s) where the issues raised are addressed in these comments.

> *1. Please describe in detail an optimal residential rate design structure based on the principles listed above and the additional principles, if any, that you recommend. For purposes of this exercise, you may assume that there are no legislative restrictions. Support your proposal with evidence citing research conducted in California or other jurisdictions.*

See sections II, III and IV.

> 2*. Explain how your proposed rate design meets each principle and compare the performance of your rate design in meeting each principle to current rate design. Please discuss any cross-subsidies potentially resulting from the proposed rate design, including cross-subsidies due to geographic location (such as among climate zones), income, and load profile. Are any such cross-subsidies appropriate based on policy principles? Where trade-offs were made among the principles, explain how you prioritized the principles.*

See sections II, III and IV, specifically IV.A.3.b. and IV.A.4.d.

> *3. How would your proposed rate design affect the value of net energy metered facilities for participants and non-participants compared to current rates?*

See sections IV.A.3.a and IV.A.3.b TOU Rates (raising concern with potential for inappropriate grandfathering of residential incentives in light of the changing load shape). CLECA respectfully defers further response to this question to after the pending evaluation by Energy and Environmental Economics on the costs and benefits of Net Energy Metering.[65] This evaluation is being undertaken in response to Assembly Bill 2514 and D.12-05-036, and should be released this summer.

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[65] *See* http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_benefit_evaluation.htm.

4. How would your proposed rate design structure meet basic electricity needs of low-income customers and customers with medical needs?

See section IV.A.4.d.

5. What unintended consequences may arise as a result of your proposed rate structure and how could the risk of those unintended consequences be minimized?

Any ratepayer risk of unintended consequences from CLECA's proposed rate design should be addressed by shadow billing as recommended in sections III.C. and IV.B.

6. For your proposed rate structure, what types of innovative technologies and services are available that can help customers reduce consumption or shift consumption to a lower cost time period? What are the costs and benefits of these technologies and services?

See section IV.A.3.d. on dynamic rates, addressing enabling technology. CLECA reserves the right to respond to other parties' comments on the costs and benefits of such technologies and services.

7. Describe how you would transition to this rate structure in a manner that promotes customer acceptance, including plans for outreach and education. Should customers be able to opt to another rate design other than the optimal rate design you propose? If so, briefly describe the other rate or rates that should be available. Discuss whether the other rate(s) would enable customers opting out to benefit from a cross-subsidy they would not enjoy under the optimal rate.

See section IV.B. Transition Period, recommending a 4-5 year transition period and a well-designed education and outreach program. *See also* section IV.A.3.d., recommending dynamic rates as an option in lieu of default TOU rates.

8. Are there any legal barriers that would hinder the implementation of your proposed rate design? If there are legal barriers, provide specific suggested edits to the pertinent sections of the Public Utilities Code. If there are legal barriers, describe how the transition to your proposed rate design would work in light of the need to obtain legislative or other regulatory changes and upcoming general rate cases.

Yes. The following Public Utilities Code Sections are legal barriers that would hinder the implementation of CLECA's proposed residential rate design.

- Section 739.(d)(1) mandating an increasing block structure;
- Section 739.(d)(3) has been argued to limit residential fixed charges;
- Section 739.7. mandating an "appropriate inverted rate structure" for residential rates;
- Sections 739.(a)(1) and 739.(b) defining baseline usage, and section 739.1.(a)(1) referencing those definitions;
- Section 739.9. limits rate increases for residential baseline usage until January 1, 2019;
- Section 739.(c) sets limits for medical baseline usage;
- Sections 739.1.(b)(2), (3) and (4) limit increases to CARE rates;
- Section 739.1.(b)(5) sets a maximum of three tiers for CARE rates and limits the implementation of the three tiers;
- Sections 745.(a), (b) and (d) limit the Commission's ability to set default TOU rates for the residential class;
- Section 2827 mandates net energy metering up to a cap for customers installing renewable Distributed Generation (although the Commission has discretion over the cap's calculation).

Ideally, none of these restrictions would be in statute, and the Commission would be able to fully exercise its expertise and authority in setting just and reasonable utility rates for the residential class and all other customer classes. Other parties may identify additional statutory sections that limit the Commission's ability to reform residential rates.

As CLECA has recommended a gradual transition to default TOU-rates with optional dynamic pricing rates and a fixed charge, the necessary legislative changes removing these restrictions can be sought over the next several years. If possible, these statutory restrictions should be deleted from the Public Utilities Code. Moreover, the timing of the utilities' general rate cases is fortuitous in that there are also several years between the likely conclusion of this rulemaking and the next Phase 2s. SCE's next Phase 2 will be for test year 2015, and PG&E's next phase 2 will be for test year 2017. If necessary, however, residential and CARE rate design reform can be sought through annual rate design window applications.

> *9. How would your proposed rate design adapt over time to changing load shapes, changing marginal electricity costs, and to changing customer response?*

Very well; it could lead to reduced residential rates, depending on the residential class' usage response. *See* section IV.A.3.b. on TOU rates and IV.A.4.d.

> *10. How would your proposed rate design structure impact the safety of electric patrons, employees, and the public?*

It is not clear if there would be a direct, discernible effect on safety from any residential rate design. However, the implementation of CLECA's proposed residential rate design could help moderate the peakiness of the residential load shape and increase the system load factor. This, in turn, could serve to ameliorate grid operability and reliability issues from increased intermittency of generation, which could lead to a safer, more reliable grid.

VI. Conclusion

Over the next 4-5 years, the Commission should seek legislative changes to enable a transition of residential customers off tiered rates and flat rates and onto default TOU-rates with optional dynamic pricing rates. Residential customers should also pay a $5/month fixed charge to recover fixed costs, and a significant customer education and outreach program should be implemented, along with shadow billing. The Commission should also undertake a revision of the CARE program, again seeking necessary statutory changes. CARE customers should receive bills showing the true cost to serve them and receive any bill reduction assistance as a separate line item on their bills. The Commission should consider a monthly cap on CARE assistance similar to that of SMUD.

Respectfully submitted,

/s/_______________

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Attachment A

Recommendations from 2011-2012 Summer Solutions Study for SMUD from Herter Associates, p. 49:

. **“Dynamic Rate.** Offer at least one residential dynamic rate option. TOU---CPP has been shown to be effective and accepted by customers in dozens of studies, including this one.

. 2) **Advanced Thermostat.** Provide, rebate, or recommend user---friendly thermostats that:

a) automate customer---programmed precooling and offsets for CPP events,
b) automate customer---programmed precooling and offsets for daily TOU peak load shifting,
c) display the real---time electricity rate and event status,12
d) (optional) display real---time energy data for the home.13

. Notably absent here for the time being is (e) HVAC efficiency optimization, which SMUD is currently field---testing for effectiveness. As HVAC optimization algorithms become better defined and understood, the addition of this feature would begin to round out a single and nearly complete customer technology solution to load management.

. 3) **Enhanced Customer Service.** For example:

a) a customer support call center that is well versed in the new rate and technology basics
b) a team of efficiency experts that can provide on---site home energy inspections, recommendations and education for $50---$100 per visit, and
c) a website with available rate options and a rate calculator with scenario testing. The ability to provide this information on paper for those without Internet access should be developed in tandem.

The results of this study do not support the use of payment for direct load control where dynamic rates are an option. The results of this study also do not support the provision or rebate of real---time energy monitors for individual appliances, due to the high cost, limited energy savings, and lower customer ratings for this feature. These results may change as home information and automation systems improve and a younger group of customers become homeowners. For the near future, however, we recommend that utilities focus on improving the effectiveness and cost---effectiveness of the program components outlined in the list above – dynamic rates, advanced thermostats, and enhanced customer service – and consider real---time energy information at the Home level a nice, but not necessary, addition to this portfolio.”