FILED
03-30-12
04:59 PM

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company for Approval of its 2010 Rate Design Window Proposal for 2-Part Peak Time Rebate and Recovery of Incremental Expenditures Required for Implementation. (U39E)	Application 10-02-028 (Filed February 26, 2010)
Application of Pacific Gas and Electric Company for Approval to Defer Consideration of Default Residential Time-Variant Pricing until Its Next General Rate Case Phase 2 Proceeding, or in the Alternative for Approval of its Proposal for Default Residential Time-Variant Pricing and For Recovery of Incremental Expenditures Required for Implementation. (U39E)	Application 10-08-005 (Filed August 9, 2010)

THE UTILITY REFORM NETWORK'S OPENING COMMENTS ADDRESSING POLICY ISSUES RELATED TO TIME-VARIANT PRICING AND RESIDENTIAL RATE DESIGN IN RESPONSE TO THE JOINT RULING OF FEBRUARY 7, 2012

Gayatri M. Schilberg
Senior Economist

William B. Marcus
Principal Economist

JBS Energy, Inc.
311 D Street
West Sacramento, CA 95605
Phone: (916) 372-0534
E-mail: gayatri@jbsenergy.com

Marcel Hawiger
Staff Attorney

Hayley Goodson
Staff Attorney

The Utility Reform Network
115 Sansome Street, Suite 900
San Francisco, CA 94104
Phone: (415) 929-8876
Fax: (415) 929-1132
E-mail: hayley@turn.org

March 30, 2012

TABLE OF CONTENTS

1 Procedural Summary 1

2 Summary of Conclusions and Recommendations 2

3 Residential Rate Design Policy 3

3.1 TURN's Proposed Goals for Rate Design 3

3.1.1 Universal service 4

3.1.2 Conservation 6

3.1.3 Peak Load Reduction 7

3.1.4 Pricing Efficiency is Not a Top Goal 9

3.1.5 Dynamic Rates are Not a Top Goal 13

3.2 Rate Design Goals May Change in the Future 14

4 An Analysis of How Different Rate Options Satisfy the Three Primary Goals 15

4.1 Residential Load Patterns of PG&E Customers 15

4.2 Current Tiered Rates Promote Universal Service and Conservation 18

4.2.1 A Brief History of Tiered Rates in California 19

4.2.2 An Analysis of California's Approach to Tiered Rates 20

4.2.2.1 Baseline Quantities Support Universal Service 20

4.2.2.2 Increasing Block Rates Support Conservation 23

4.2.2.3 A Rate Design with No Customer Charge Supports Conservation 25

4.3 Dynamic Pricing: Minimal Impacts on Peak Shaving, Adverse Impacts on Universal Service 26

4.3.1 Introduction 26

4.3.2 Dynamic Pricing Is Likely to Offer Only Minimal Peak Savings, with Adverse Consequences. 27

4.3.2.1 Benefits are Unlikely to Be Realized 28

4.3.2.2 Potential Adverse Consequences 29

4.3.2.2.1 Some Customers Will Lose Financially 29

4.3.2.2.2 Absent Technology Dynamic Rates Won't Sustain Customer Interest and Behavioral Change 31

4.3.2.2.3 Customer Confusion and Resistance 32

4.3.2.2.4 Increased Risk for Residential Customers 34

4.3.2.3 Dynamic Pricing Gives Low Quality Demand Response 37

4.3.2.4 To Achieve Reliable Demand Response, Technology May Be Better Than Dynamic Pricing 37

4.3.3 Dynamic Rates Could Adversely Affect Universal Service 38

4.3.3.1 Dynamic Rates Affect Vulnerable Populations 38

4.3.3.1.1 Low Income Customers 39

4.3.3.1.2 Other Vulnerable Groups 41

4.3.3.2 Higher Summer Volatility and Bill Arrearages 42

4.3.4 Dynamic Rates can Adversely Impact Conservation Goals 43

4.3.4.1 No Evidence of Conservation Effects with Dynamic Rates 43

4.3.4.2 A Dynamic Rate Design is a Disincentive to AC Efficiency 43
4.4 Default TOU: Weakly Supports Conservation and Peak Shaving; Adverse Impacts on Universal Service 44
4.4.1 TOU Rates Support Conservation and Peak Shaving.....44
4.4.1.1 SMUD Summer Solutions 45
4.4.1.2 Simulation.....46
4.4.2 Adverse Impacts of Default TOU Rates 46
4.4.2.1 Universal Service.....46
4.4.2.1.1 Bill Impacts 46
4.4.2.1.2 Regional Transfers 47
4.4.2.2 Increases Customer Risk.....47
4.5 Peak Time Rebates (PTR) 48

5 The Path Forward.....49
5.1 The Current "Problems" 49
5.2 Rate Design is Pragmatic.....51
5.3 Envisioning Alternatives to California's Existing Tiered Rates 52
5.4 Evaluating Possible Changes to the Structure of CARE 53
5.5 Solar Distributed Generation.....59
5.6 EV Rates.....60

6 Conclusion 60

THE UTILITY REFORM NETWORK'S OPENING COMMENTS ADDRESSING POLICY ISSUES RELATED TO TIME-VARIANT PRICING AND RESIDENTIAL RATE DESIGN IN RESPONSE TO THE JOINT RULING OF FEBRUARY 7, 2012

1 Procedural Summary

Pursuant to the Commission's direction in Decision (D.) 09-03-026 (the SmartMeter Upgrade Decision), PG&E filed Application 10-02-028 in February of 2010, proposing a default peak time rebate ("PTR") residential rate schedule. Under the PTR rate, residential customers would receive a bill credit of $0.75 or $1.25 (with enabling technology) per kilowatthour for usage below the customer's individual historic baseline. The accumulated "credits" would be paid by all other residential customers, resulting in slightly higher rates for those customers. PG&E requested implementation costs of $32.7 million.

Subsequently, pursuant to direction in D.08-07-045, PG&E filed application 10-08-028 in August of 2010, proposing a default peak day pricing ("PDP") tariff. The PDP rate schedule combines a critical peak pricing adder of $0.50 cents per kilowatthour with an underlying time of use ('TOU") rate schedule, on top of tiered rates. However, PG&E recommended that the Commission defer consideration of the default peak day pricing tariff until at least 2014, explaining that "that everyone (i.e., the customers, the Commission, the utility) should have several years experience with PTR before the default rate changes again."[1]

TURN supported this recommendation. TURN also noted that if the Commission chose to pursue PDP, it should first address the legal question of whether a critical peak pricing surcharge violates statutory protections against rate increases for usage up to 130% of baseline.

In October of 2011 PG&E refilled its PTR testimony. PG&E recommended that the Commission consider both the PTR and the PDP tariffs together to chart a path for time-variant pricing for residential customers.

---

[1] Application 10-08-028, p. 4.

On February 7, 2012 the Assigned Commissioner and the Administrative Law Judges assigned to each proceeding issued a Joint Ruling (the "Joint Ruling") consolidating the two proceedings. The Joint Ruling asked for parties to brief two legal issues concerning the proposed PDP rate. Additionally, the Joint Ruling asked parties to recommend residential rate designs for each year 2012-2020. Pursuant to the Joint Ruling, TURN submits these comments addressing our recommendations for residential rate design. TURN is filing a separate legal brief today addressing the legal questions raised in the Joint Ruling.

2 Summary of Conclusions and Recommendations

The Joint Ruling requests parties to identify their preferred residential rate design for each year from 2012 through 2020 and to provide "detailed support" for the recommendations. Even though PG&E's two consolidated applications concern only the choice between PTR versus PDP, the Ruling more broadly asks for recommendations among any of the presently available or proposed residential tariffs.

TURN addresses this request first by comparing the impacts of different rate schedules with respect to three principal goals – universal service, conservation and load shifting. TURN appreciates that the present five-tiered inclining block rates, with restrictions on rate increases for a significant portion of usage, may not be a sustainable long-term rate design. However, the present system is an artifact of the deregulation energy crisis of 2000-2001. TURN suggests that the optimal way to meet the three primary goals in the long run is to reform the inclining block rate schedule because a default residential inverted tier rate design, with the existing baseline system and no customer charge, best advances the policy goals of universal service and conservation.

TURN recognizes that many parties have espoused time-variant pricing to promote economic efficiency and load shifting. We suggest that actual underlying benefits of load shifting are more likely achieved through automated demand response programs than through residential rate design. TURN concludes that the potential negative impacts of time-variant pricing outweigh its potential benefit.

Finally, TURN contends that given a choice only between PDP and PTR time-variant rate options for residential customers, the Commission should implement "reward

pricing" rather than "penalty pricing" because penalty pricing under PDP undercuts the policy objectives of universal service and conservation.[2]

3 Residential Rate Design Policy

The Joint Ruling invites parties to discuss their recommendations for future residential rate design. As explained by TURN above, existing California law prohibits the Commission from deviating from certain statutory requirements regarding residential rate design until 2019. Notwithstanding these important restrictions, in this section TURN presents an overview of our recommendations for the development of future residential rate design. This discussion is a work in progress and should be considered as such. TURN looks forward to further developing our recommendations in what we understand to be the Commission's forthcoming rulemaking proceeding on residential rate design.

3.1 TURN's Proposed Goals for Rate Design

TURN, like many others, believes that rate design choices should be guided by underlying policy objectives.[3] Traditionally, utility regulators have turned to the widely accepted Bonbright Principles to inform rate design for regulated monopolies. Published in 1961, James C. Bonbright's *Principles of Public Utility Rates* offers the following 10 principles:

- Rates should be simple, understandable, and acceptable to the public;
- Rates should be stable and predictable and provide bill stability for customers;
- Rates should be practical to implement and easy to interpret;
- Rates should yield the total revenue requirement;
- Rates should provide predictable and stable revenues;
- Rates should be set so as to promote efficient resource use;
- Rates should reflect all costs in the provision of electricity service;
- Rates should be apportioned fairly among customers and customer classes;
- Rates should avoid undue discrimination; and

---

[2] However, as we explain in our concurrently filed legal brief, if the Commission chooses to pursue a default PDP, CPP or TOU rate, it must order PG&E to file a revised application that is compliant with California Public Utilities Code § 739.9 requirements.

[3] "The first step is to pin down the ratemaking objectives." Ahmad Faruqui, "Inclining Toward Efficiency, Public Utilities Fortnightly, August 2008, p. 24.

- Rates should promote innovation in supply and demand.[4]

Bonbright's context, "of course, was traditional price-based regulation."[5] While his principles are well-known, they do not necessarily provide the Commission with the most useful analytical framework for evaluating future residential rate design in accordance with California's particular energy policy goals and unique ratemaking practices.[6]

TURN recommends that the Commission evaluate near-term residential rate design choices using the three policy pillars of (1) universal service, (2) conservation, and (3) peak load reduction. TURN uses these three goals as a reflection of current State policy, while acknowledging the importance of other policy goals. A discussion of each of these three goals, as well as TURN's rationale for excluding other oft-cited policy goals, follows below. Thereafter, TURN evaluates various existing and potential rate design choices in terms of their furtherance of these policy goals.

3.1.1 Universal service

The policy goal of universal service embodies the principle that all Californians should have access to energy utility service to meet their basic energy needs. The absence of affordable energy utility services is a serious public health and safety issue. As the United States Supreme Court stated in *Memphis Light, Gas & Water Division v. Craft*, "Utility service is a necessity of modern life; indeed, the discontinuance of water or heating for even short periods of time may threaten health and safety."[7]

---

[4] F. Weston, The Regulatory Assistance Project, "Charging for Distribution Utility Services: Issues in Rate Design," December 2000, p. 24 (citing Bonbright, p. 291; Bonbright *et al*., pp. 384-385); The Brattle Group, "Rethinking Rate Design," September 2007, p. 13.

[5] W. Shirley, J. Lazar, and F. Weston, The Regulatory Assistance Project, "Revenue Decoupling: Standards and Criteria" (A Report to the Minnesota Public Utilities Commission), June 2008, p. 18.

[6] For example, the goal of revenue stability, cited by Bonbright and often included as a goal of rate design, is covered by other mechanisms in California such as ERRA.

[7] *Memphis Light, Gas & Water Division v. Craft* (1978) 436 U.S. 1, 18. *See also* D.07-09-041, issued in A.02-11-017 / I.03-01-012 / A.02-09-005, pp. 40-41 (finding that

In recognition of the essential nature of energy utility services, the California Legislature has declared that "light and heat are basic human rights, and must be made available to all the people at low cost for basic minimum quantities."[8] As California Public Utilities Code § 739(d)(2) provides, "electricity and gas services are necessities, for which a low affordable rate is desirable."[9]

To facilitate universal service, the Legislature has mandated for almost 40 years that the Commission set an affordable rate for minimum quantities of electricity and natural gas necessary to meet basic needs, an amount originally referred to as "lifeline quantity" and subsequently changed to the "baseline quantity." The lifeline system, predecessor to the current baseline program, was established in 1975, with the addition of § 739 to the Public Utilities Code.[10] The baseline program came into being in 1982, when § 739 was amended by AB 2443.[11] This amendment changed the previously designated lifeline allowances for specific end uses for residential customers to baseline quantities to be computed as a percent of average residential usage.[12]

The goal of universal service requires that all Californians be able to afford to meet their basic energy needs, no matter where in the state they reside. For this reason, the Commission must, pursuant to Pub. Util. Code § 739(a)(1), "take into account climactic and seasonal variations in consumption" in determining the amount of energy necessary to meet basic needs, for which rate affordability is of paramount importance.[13] The resulting rate scheme, in which baseline quantities vary with climate-related consumption, causes subsidies from cooler to hotter baseline regions, where air

---

utility customers are physically harmed by the termination of electric and/or natural gas utility service for nonpayment).

[8] California Stats 1975, Ch. 1010, Section 1(a).

[9] Cal. Pub. Util. Code § 739(d)(2). All statutory references are to the California Public Utilities Code unless otherwise specified.

[10] *See, i.e.,* D.86087, 80 CPUC 182, 1976 Cal. PUC LEXIS 387 (interim order establishing "lifeline" quantities of electricity and natural gas and establishing rates structures for the provision of lifeline quantities of energy to residential customers, pursuant to the Warren-Miller Energy Lifeline Act of 1975).

[11] D.04-02-057, issued in R.01-05-047, fn. 8, p. 18.

[12] D.84-02-064, 14 CPUC2d 372, 1984 Cal. PUC LEXIS 126, *12.

[13] Cal. Pub. Util. Code § 739(a)(1).

conditioning use results in higher overall consumption patterns.[14] Yet it is important to keep in mind that these geographic subsidies, mandated by the Legislature, serve the purpose of advancing energy affordability for those living in the inland regions, and thus universal service.[15]

3.1.2 Conservation

In addition to universal service, rate design has been used to encourage energy conservation in California since the passage of Assembly Bill 167, the Warren-Miller Energy Lifeline Act, in 1975, which added Section 739 to the Public Utilities Code.[16] As the Commission explained in D.04-02-057:

> § 739(c)(2) establishes joint principles of affordability and conservation, which must both be observed in establishing residential electric and gas rates. … We view the principles of affordability and conservation as complementary underpinnings of a sound rate design. As a general matter, basic energy needs should be affordable, with incentives for conservation focused on higher usage levels that are more likely to be discretionary.[17]

Rate design that supports the goal of conservation is also consistent with California's loading order of electric resources. Since the adoption of the *Energy Action Plan* in 2003 by the Commission, the California Energy Commission, and the California Power Authority, conservation and energy efficiency have been first in the State's loading order, ahead of all other resource types, including peak-shaving resources like

---

[14] This geography-based subsidy is discussed below in Section 4.2.2.1.

[15] Unless and until the Legislature determines that such geographic subsidies should cease to be employed as a means of advancing universal service, rate design should account for climate-driven variations in usage patterns in preserving access to utility service for all Californians.

[16] D.86087, 80 CPUC 182, 1976 Cal. PUC LEXIS 387, *13 ("The statute is also specific in its criticism of present rate structures' encouraging wastefulness by large users and in its intent to encourage conservation of scarce energy sources.").

[17] D.04-02-057, p. 31; s*ee also*, p. 24 (acknowledging the legislative intent to continue encouraging energy conservation through rate design, as provided for by the Warren-Miller Energy Lifeline Act of 1975, at the time AB 2443 was enacted in 1982).

demand response and renewable supply-side resources.[18] The reduction of energy consumption through conservation and energy efficiency is also the least cost strategy to achieve the State's AB 32 greenhouse gas emissions reduction goals for the energy sector.[19]

3.1.3 Peak Load Reduction

For nearly a decade now, California energy policy has also focused on the goal of peak load reduction or load shifting. Since approximately 2003 this Commission has pushed for a critical peak pricing alternative for residential customers.[20] The primary impetus for this policy goal was the reduction of air-conditioner driven residential peak load. The Commission also supported some adoption of programmable thermostats for this very same reason.[21] Peak reduction through demand response is second to conservation and energy efficiency in the loading order.[22] Given the attention paid by policymakers to peak load reduction in recent years, TURN incorporates this policy goal into our analysis of rate design options.

However, we also caution that the Commission may be wise to revisit the value of peak load reduction as a rate design goal, in light of changing circumstances. Peak load was a major reliability concern in the 2000-2002 time period, when California reserve margins were extremely low, and the combination of low margins and market manipulation by generators and marketers resulted in the so-called "energy crisis," with the resulting loss of billions of ratepayer dollars due to manipulated wholesale energy prices.

---

[18] *See, i.e., Energy Action Plan*, 2003, p. 5; *Energy Action Plan II*, 2005, p. 3; *Energy Action Plan 2008 Update*, 2008, p. 1.

[19] *See, i.e., Energy Action Plan II*, 2005, p. 3; *Energy Action Plan 2008 Update*, 2008, p. 6.

[20] *See, i.e., Energy Action Plan*, 2003, p. 5. D.05-09-044 at p. 3, approving pre-deployment funding for PG&E's AMI Infrastructure, reiterated the six minimum functionality criteria for AMI, which included "be capable of supporting a wide range of price responsive tariffs."

[21] D.08-09-039 approved the settlement of SCE's AMI application, which included a voluntary PCT program.

[22] *Energy Action Plan II*, 2005, pp. 6-7.

Some parties also championed peak load reduction or load shifting through pricing as a major environmental goal to reduce air emissions of either priority pollutants or greenhouse gases. Most of those parties fundamentally misunderstood the emissions impacts of reducing energy consumption or shifting load in the top 100 hours. There are some small air emissions benefits from reducing peaker plant output on hot summer afternoons, which already are poor air quality days.[23] However, the GHG reduction benefits are extremely minimal for two reasons. If there is only load shifting and no net energy reduction, the GHG benefit is due only to the differential emissions between a CT and a CCGT over 100 hours. Also, even if there is complete load reduction, the total output over 100 hours is simply not that large.

The addition of significant generation capacity since 2000 and the adoption of resource adequacy requirements have changed the situation significantly. The system-wide CAISO reserve margin is presently forecast to be well above the 15% planning margin in 2020.[24] Now peak load reduction is not such a critical issue for system reliability. Indeed, this is true even though residential load factors have declined due to the addition of large homes with central air conditioning systems in the Central Valley.

Further, the impact of high reserve margins is directly reflected in much lower on-peak energy prices.[25] Price-driven demand response has faltered, at least in part, precisely because the price ratios are insufficient to justify private investment.

As a result of these changes over the past decade, basing residential rate design on the overriding goal of reducing residential air conditioner load in the top 100 hours may no longer make sense.

---

[23] However, even this conclusion is limited to California, due to the high use of CCGT over many hours. There are many regions in the country where shifting load to off-peak or part-peak actually increases the running time of baseload coal, thus increasing net emissions.

[24] The ISO actually forecasts much higher reserve margins. TURN does not at all necessarily agree with the ISO's specific numbers and assumptions. But we agree that generally there is a large planning reserve margin.

[25] See Testimony of Andrew Bell in Phase 2 of PG&E's 2011 GRC, A.10-03-014, March 22, 2010, Ex. PG&E-1, p. 92-93, quoted in Robert Levin, DRA, "Time Variant Pricing for California's Small Electric Consumers," May, 2011, p. 19-20.

At the same time, TURN still maintains that peak load reduction is a valid policy goal because of its other consumer benefits, even if rate design is not the best means of achieving that end. TURN has explained in numerous Commission dockets that increasing the load factor by reducing residential peak load has much greater consumer benefits (less need for expensive peaking capacity, better cost allocation with reduced residential peak) than environmental benefits. Thus, TURN has consistently advocated for programs and policies that provide effective peak load reduction, as opposed to pricing or lighting efficiency programs that either reduce off-peak energy or are unreliable.

Much of the focus of the discussion concerning "demand response" has now shifted to the issue of using DR as a reliability mechanism (through ancillary services) and/or for renewable integration (also through ancillary services). These are potentially very useful goals. However, the need for reliability or renewable integration is not tied to wholesale market prices, though at times it might correlate. As discussed below in Section 4.3.2.4, these goals require dependable and dispatchable demand response. Such demand response can only be achieved through programs and automation, not through pricing.

3.1.4 Pricing Efficiency is Not a Top Goal

Many who promote time-variant pricing argue that it promotes economic efficiency by linking wholesale costs to retail rates, thus promoting efficient use of the electric commodity. Those proponents of strict economic efficiency argue that time-variant pricing will naturally lower on-peak use, promote conservation and reduce existing subsidies to those who use disproportionately more on-peak electricity (those with worse than average load profiles).

TURN does <u>not</u> include economic efficiency as one of our top three goals for rate design. We believe that promoting conservation and load shifting are best done from the bottom-up, by focusing on how to design rates and programs that promote those goals, rather than assuming that "economic efficiency" equates with environmental sustainability.

TURN does not oppose reflecting costs in rates. It is one of the principles of rate design, as tempered by other principles. Cost of service is often of paramount concern in allocating transmission and distribution costs among customer classes, though the actual mechanics of determining how to allocate costs to different customer classes are surprisingly unclear.

However, TURN suggests that a strict adherence to economic efficiency in residential rate design is misplaced. It leads to conclusions such as the criticism of high tiered rates based on the fact that they exceed the marginal cost of supplying power, so that customers "will inefficiently over-conserve on electricity."[26] While TURN agrees that there may be problems with current upper tier rates, a concern about "over-conservation" is not one of them. We suggest that designing rates based on the rationale that people (especially in higher income brackets)[27] are "over-conserving" does not support California's energy policy goals.

Perhaps even more importantly, there are several aspects of both the electricity market and the residential housing market which preclude efficient textbook behavior by multifamily and single family residential dwellers. Electricity is a secondary, and rarely a primary, economic good. Residential customers use electricity as a means to an end (comfort, entertainment, communication). The primary driver of consumption is the end result, and the price of electricity as a commodity is only secondary.

Residential electric customers have a very low price elasticity.[28] The numerous critical peak pricing pilots that demonstrate peak load reductions of 10-15% use arbitrary peak price adders of 50 to 75 cents per kilowatthour to generate such a response. The extreme case of economically efficient pricing is real time pricing. But the wholesale market prices in the top 100 hours in California are much less than 50 cents above

---

[26] Severin Borenstein, "Regional and Income Distribution Effects of Alternative Retail Electricity Tariffs," Haas Workpaper #225, October 2011, p. 1.

[27] Research by Borenstein shows that higher income groups would receive the most benefit from the more "efficient" rate designs that he advocates, including customer charges and flat rates. Ibid.

[28] S. Borenstein, "Customer Impacts of Potential Changes in Residential Electricity Tariffs," CFEE Conference, March 6, 2012, p. 18.

average off-peak prices,[29] and using such "real prices" would result in minimal impacts on customer usage. It is precisely for this reason that policy makers have focused on charging high prices on only 10-15 afternoons of the year.[30]

There are other structural barriers in the residential market. The classic landlord/tenant split incentive limits the long-run efficient response to retail rates. Almost half of California's population rent their homes, and often the landlord is responsible for the choice of large appliances such as HVAC units, water heaters, refrigerators, and built-in stoves. Tenants also face barriers in obtaining more efficient appliances, thus their consumption choices are very limited, for a given level of comfort.

Even for home owners, the time line of ownership does not match payback periods for efficiency investments. Generally, the home builder selects major appliances for most large-scale developments and includes them in the sale price. The first owner may be reluctant to upgrade to more efficient appliances to replace new ones. Even with older homes, a new purchaser always has to consider whether their expected occupancy length will be sufficient to recoup the investment in more efficient appliances. The average length of home ownership may be shorter than the payback period of most residential appliance investments. More efficient rates will not solve these and other market barriers that preclude residential investments in energy efficiency.

Another aspect of the economic efficiency arguments is the contention that the present rate design results in a cross-subsidy from users with better than average load profiles (generally coastal customers without air conditioning) to users with worse than average load profiles (generally inland customers with air conditioning). This cross-subsidy results from the fact that present rates do not distinguish between on-peak and

---

[29] See citations in footnote 25 above.

[30] During the early years of the Power Exchange (1999-2000), wholesale prices exhibited the classic supply profile with extremely high prices in the top 100 hours. But this result very much reflected temporary conditions – an energy-only market coupled with extremely low reserve margin. Current conditions, with year-ahead capacity requirements and high reserve margins, result in much lower prices even in the top 100 hours.

off-peak energy; both are sold to customers at the same price. The allegation is that on-peak energy costs more to purchase.[31]

TURN does not disagree that there may be some cross-subsidy among residential customers without time-variant pricing. However, these experts do not address the underlying question of whether such a cross-subsidy, which admittedly reduces economic efficiency, is bad policy. The primary impact of the cross-subsidy from users with better than average load profile to users with worse than average load profile is a geographic subsidy from coast to inland. However, the much bigger impact is the cross-subsidy resulting from different baseline zones targeted to geography. This subsidy is *mandated* under § 739, which requires the Commission to establish baseline quantities by taking "into account climatic and seasonal variations in consumption and the availability of gas service."[32] California is a big state. PG&E is one of the largest (if not the largest) utilities in the country, with a service territory stretching across many different geographies and climate zones. The Legislature has made a policy decision that subsidies due to different baseline quantities for different climate zones are warranted. The fact that such a policy may not lead to the most economically efficient outcome does not necessarily make it bad policy.

Indeed, there are various other "cross-subsidies" built into rate design. For example, it is highly probable that rural customers cost more to serve than urban customers due to simple density impacts. But we have chosen to tolerate this subsidy in rate design based on other policy goals, such as universal service. Research has also shown that single family residential customers cost more to serve than multifamily customers.[33] Again, over decades we have made the decision to tolerate this cross-subsidy in California.

---

[31] TURN does not disagree that in a general sense a peaker plant has higher variable operating costs, and that ISO market prices are generally higher on-peak. However, PG&E's critical peak pricing adder of 50 cents per kilowatthour is not a 'cost-based' rate that reflects market prices.

[32] § 739(a)(1).

[33] W. B. Marcus, Prepared Testimony on Marginal Cost, Revenue Allocation and Rate Design of Southern California Edison on behalf of TURN, June 1995.

In summary, there are so many factors in the consumption of electricity that interfere with the direct link between price and quantity consumed, that to base rate design policy on expectations of efficiencies due to achieving "perfection" in electricity pricing as a reflector of costs will lead to little benefit, and will result in costs and potential harm to certain residential customers. More importantly, while rate design is certainly an important tool to advance goals, and it is important to align rate design with other goals, our consistent and overarching conclusion is that the primary goal of time-variant pricing – shifting load to off-peak use – can be better achieved through more targeted and focused programs. The primary state goals of conservation, demand response and universal service will not be well served by strict adherence to "efficient" pricing.

3.1.5 Dynamic Rates are Not a Top Goal

For the reasons above TURN also does not *a priori* consider dynamic rates, especially as a default for residential customers, as an end goal or criterion for determining residential rate design. Because electricity is a secondary commodity, residential electric customers, by and large, are not interested in minute-by-minute attention to the electricity price, consumption, and behavioral responsiveness that is needed to extract the maximum efficiency from dynamic rates. Customer acceptance of dynamic rates is discussed in Section 4.3.2.2.2 below.

Additionally, current prices in California for different time periods rarely warrant a significant enough price differential for residential customers to effect major consumption changes.[34] But even if the price differentials were to increase significantly, dynamic rates should not be the goal. Rather, each dynamic rate design under consideration should be evaluated in terms of its impact on the broader State policy goals of universal service, conservation, and peak load reduction (or the successor goals, if any). As discussed in Section 3.1.3 above, TURN agrees that load shifting is a valid goal to consider in rate design. However, our analysis below shows that the underlying

---

[34] See citation in footnote 25 above.

purposes of load shifting -- reliability, integration, cost reduction -- are better addressed through programs and automation than through energy prices in retail rates.

Dynamic pricing does impact two important policy goals: investment in behind-the-meter distributed generation (especially solar) and appropriate charging of electric vehicles. Higher on-peak pricing under net metering increases the value of on-site solar. However, it is really the time-of-use component of the rate, not any critical peak pricing for 100 hours, that increases the value of solar generation. TURN has not objected to voluntary TOU tariffs being available to solar customer generators under net energy metering tariffs.

How to motivate off-peak charging of EVs, and even more importantly, diversity in charging times, is a complex issue. Certainly, TOU rates for EV customers may be one solution. TURN suggests, however, that while the Commission and the utilities have focused AMI deployment with the hopes of eventually using a "price to device" system for appliances, there may be much greater benefit in using the AMI system to communicate with smart chips in EVs to direct charging to off-peak periods irrespective of prices, and perhaps correlated to local circuit conditions.

3.2 Rate Design Goals May Change in the Future

TURN advocates the use of the three rate design goals most reflective of California's current energy policy: universal service, conservation and peak load reduction. However, we also acknowledge, as discussed above, that it may be time for the Commission to reconsider the appropriateness of peak load reduction as a major rate design policy goal, particularly in light of changes in resource adequacy and on-peak energy prices. At this time, peak load reduction may not be necessary for system reliability, and California's environmental goals may be better served by other means.

At the same time, there are other changes on the near term horizon that are critical for system reliability and environmental impacts. For example, California must find a way to integrate large amounts of intermittent renewable resources. Various parties see utility direct load management on a real time basis through automation and AMI as a tool to regulate residential load for integration purposes. State policy also favors an increase in renewable distributed generation, particularly rooftop solar. Also, there is great hope

that electric vehicles (EV) will reduce transportation emissions. This Commission has adopted policies to promote EV growth. The Commission may determine that GHG emissions reductions should be a policy goal guiding rate design development, with the impact on EV penetration, rooftop solar, and renewable integration, among others, as specific considerations.

4 An Analysis of How Different Rate Options Satisfy the Three Primary Goals

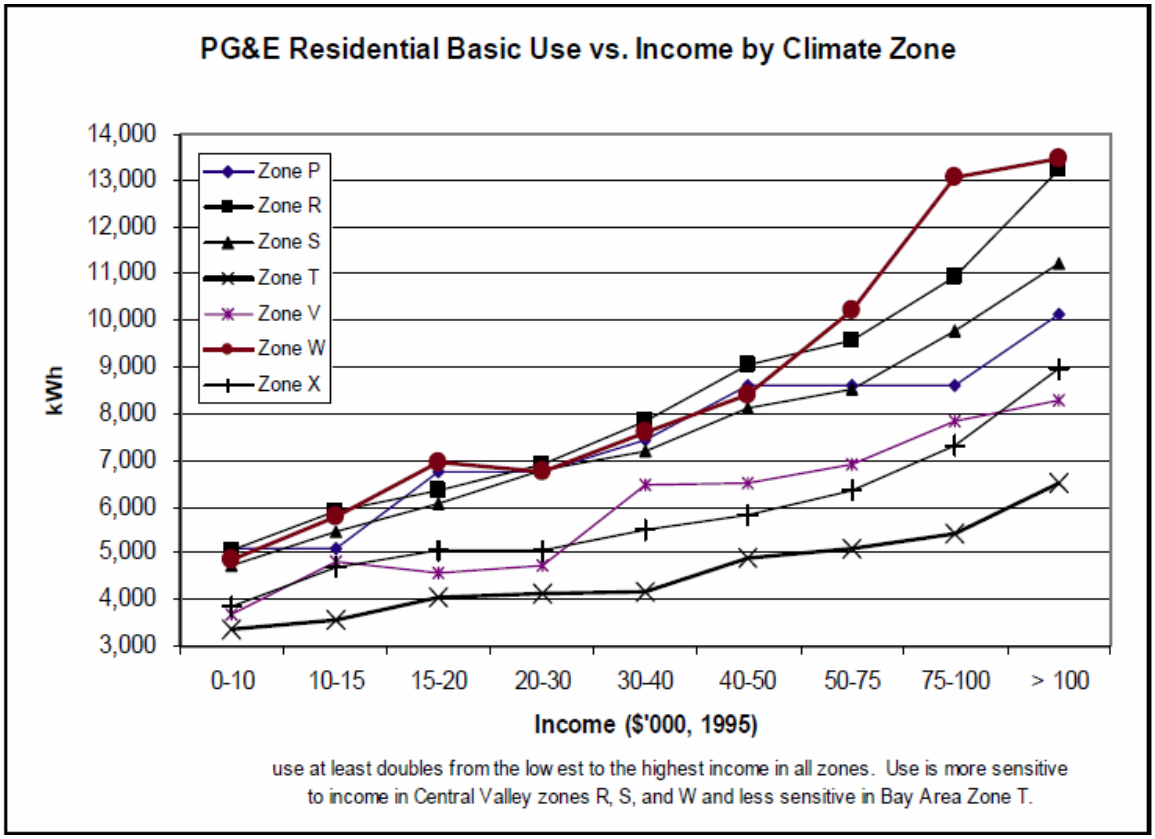
As a background to our examination of how different rate design options satisfy the goals listed above, we first describe some factual aspects of the load patterns of PG&E's residential customers.

4.1 Residential Load Patterns of PG&E Customers

Research by JBS Energy, Inc. has examined characteristics and electricity consumption patterns of California customers.[35] These facts underlie our analysis and conclusions in the sections below. Some findings are shown in Figure 1.

[35] W. Marcus, G. Ruszovan and J. Nahigian, "Economic and Demographic Factors Affecting California Residential Energy Use," September, 2002. Also W. Marcus and G. Ruszovan, "Know Your Customers: A Presentation to the UCEI Policy Conference," December 10, 2007. Both are available at http://jbsenergy.com/Energy/Papers/papers.htm.

Figure 1: PG&E Residential Basic Use vs. Income by Climate Zone



Source: W. Marcus, G. Ruszovan and J. Nahigian, "Economic and Demographic Factors Affecting California Residential Energy Use," September, 2002

The demographic data show the following:

- Higher residential income is generally accompanied by higher electricity use. Electricity use by high income customers (over $100,000) was 2-2.5 times that of households under $15,000 in nearly all utilities and climate zones.
- Energy use rises with the size of the dwelling unit. This result holds for all climate zones. The use in very large dwellings is typically 250-350% of usage in the smallest dwellings.
- Even when controlling for the climate zone of the customer, small basic customers ("basic" defined as not "all-electric" homes) use proportionally less peak demand and peak energy than larger ones. They have a lower

saturation of AC units, live in smaller dwellings (apartments and small houses), with lower incomes and fewer household members, and fewer electric appliances (laundry, electric stoves, etc.). Small customers therefore have less demand response potential than large customers.

- Households with senior citizens tend to use more electricity, but not in all climate zones.
- Households of three or more people with lower-middle incomes ($30,000 to $40,000 in 1995) and living in moderate sized dwellings on average use more than 130% of baseline on a year-round basis, with even higher use in peak summer months. The cost impact of this usage is larger in PG&E's Central Valley (up to $100 in rate surcharges alone for the average customer) than in the Bay Area, but the phenomenon is prevalent everywhere.
- Households with gas heat and a member who works at home use an extra 50 kWh in PG&E's coastal zone T and an extra 70-100 kWh per month in most other PG&E zones.
- PG&E's housing stock varies greatly by climate zone. Zone T (Bay Area and southern coast) has more housing of less than 1000 square feet and less in the range between 1500-2500 square feet than other climate zones. Zone T also has a smaller proportion of single-family housing compared to other PG&E regions, most of which have over 80% single-family housing.
- Unlike Zone T, the climate and baseline allowances in Zone S (and other hot zones) can result in a significant number of lower-middle-income large families paying surcharges for hundreds of kilowatt-hours per month at average levels of usage. Unlike Zone T, the average family of 3 to 6 earning $30,000 to $40,000 and living in a small house will substantially exceed 130% of the baseline allowance on an annual basis and in the peak month of July.

- Central Valley customers use a higher percentage of their summer energy on peak than other customers and coastal customers use a lower percentage of summer energy on peak. This means that load factors of Coastal customers are better (flatter – because of less air conditioning) than those of Central Valley customers.

These facts have important implications for the consequences of changes in rate design.

- Coastal customers, by virtue of smaller dwelling sizes and cooler climate, have lower overall electricity use than hotter areas. They also have a flatter load shape (less peaky).
- Unlike users in the Coastal zone, customers in hotter zones will generally exceed the 130% baseline allowance consistently.
- Smaller customers generally have less potential for demand response than larger customers. They have fewer electric appliances, live in smaller dwellings, and have a lower saturation of AC units.

4.2 Current Tiered Rates Promote Universal Service and Conservation

Many parties have criticized current residential inverted tiered rates. The criticisms fall into two general camps. The proponents of dynamic pricing claim that tiered rates do not reflect actual costs and do not provide any timely price signal to inform customer response. Others focus on the bill impacts on upper tier users resulting from the fact that the first two rate tiers did not increase in 2001-2010 and can now increase by only a prescribed amount. .

TURN does not disagree that there are some valid problems with today's inclining block rate design and tier differentials. However, the shape of today's four- and five-tiered rates should not obscure the benefits from tiered rates as a general matter. The real or perceived problems are not inherent in tiered rates. Rather, they result from a system of tiers and statutory protections that are a remnant of the deregulation disaster of 2000-2001. In the sections that follow, TURN briefly discusses this history before analyzing

the structural elements of California's tiered rates and their impacts on TURN's three rate design policy goals.

4.2.1 A Brief History of Tiered Rates in California

California implemented inclining block tiered rates, or inverted tiered rates, with the passage of the Warren-Miller Energy Lifeline Act in 1975. These so-called "lifeline rates" had two original goals: an affordable lower rate to meet basic needs and a conservation incentive.[36] For about twenty-five years, baseline rates included just two tiers – the baseline and the above baseline. This system worked fairly well as a stable and comprehensible rate design that contributed to California's conservation and affordability goals.

However, the energy deregulation crisis resulted in billions of dollars of utility wholesale power costs which were not collected due to rates frozen by AB 1890 (Stats. 1996, Ch. 854). These rates were "frozen" *not to benefit ratepayers,* but to benefit utilities. The expectation was that wholesale prices would always be lower than frozen rates, and the utilities expected to collect billions from this "headroom" as compensation for sunk costs imperiled by deregulation. The present system of four or five tiers only came into place in 2001-2002 as a method to recover the huge cost overruns from deregulation. The first two tiers (for use up to 130% of baseline) were frozen from increases in AB 1X-1 (Stats. 2001, 1st Ex. Sess., Ch. 4), codified as Water Code § 80110, so as to insulate residential customers somewhat from losses caused by a system they did not want.[37]

Due to the protections for any usage up to 130% of baseline, all new cost increases resulted in steadily increasing upper tier rates. For a while, everyone assumed that with the expiration of above-market DWR contracts, rates would return to normal levels. This has not come to pass. The pressure to reduce upper tier rate growth resulted in the passage of SB 695 (Stats. 2009, Ch. 337), which allowed for limited and controlled increases in non-CARE tier 1 and 2 rates.

---

[36] California Stats 1975, Ch. 1010, Section 1.

[37] The legislature recognized that it was the large industrial customers, together with the generators and marketers (think Enron) who pushed for electric deregulation.

Even so, the utilities continue to forecast large increases in upper tier rates. Of course the Commission has great authority in making such increases a reality or not. Utility rate case increases, for one, are entirely within the Commission's jurisdiction, as are many other utility proposals (and Commission initiatives) that would increase rates. Even if the Commission does not exercise restraint in authorizing utility expenditures that would increase rates, future revenues from the sale of GHG allowances will reduce upper tier rates. Yet TURN recognizes that the upper tier rates may continue to increase to unsustainable levels between now and 2019, when the rate restrictions in § 739.9 for usage up to 130% of baseline expire.

Nevertheless, TURN urges the Commission to look beyond the present tiered rates themselves when considering the optimal default rate design for residential customers. As discussed in this section, increasing block tiered rates promote universal service and conservation. Notwithstanding the current statutory restrictions on rates for usage up to 130% of baseline, the Commission should recognize that tiered rates, with characteristics such as those proposed by TURN in Section 5 below, are indeed well suited to advancing the State's rate design goals.

4.2.2 An Analysis of California's Approach to Tiered Rates

There are three components of the current residential rate design in California, which are often lumped together in referring to "tiered rates."[38] These components are a baseline quantity, increasing block rates, and the absence of a customer charge (for PG&E and SDG&E).[39] In evaluating the extent to which inverted tiered rates support TURN's rate design goals, TURN considers each of these components.

4.2.2.1 Baseline Quantities Support Universal Service

California's baseline system supports the policy goal of universal service in two ways. First, the baseline program promotes bill affordability by ensuring that all

---

[38] Some parties categorize present residential rates as "flat rates," which is entirely inaccurate. Many states do have flat residential rates, thus providing no conservation signal.

[39] SCE, for example, currently has a customer charge of $0.70 per month for single family residential customers.

residential utility customers have access to minimum quantities of electricity and natural gas necessary to meet basic needs at a low rate. In fact, approximately 15-30% of PG&E's customers (depending on baseline zone) consume no more electricity than the baseline quantity each month. Their usage patterns, in conjunction with the low baseline rate, help to maintain affordable bills.

Second, the baseline program tempers the geographic differences in bill affordability that would otherwise flow from inverted tiered rates. Pursuant to the mandate of § 739(a)(1), baseline quantities are set for customers in each climate zone within the utility's service territory, based on average residential customer usage in that climate zone. One result of this system is that customers in hotter climates zone are afforded larger baseline quantities than those in climate zones where air conditioning is unnecessary or rarely used. Because a larger baseline quantity means more consumption billed at the lowest rate, California's baseline system mitigates the bill variations that would otherwise exist between climate zones, rendering bills more affordable for those in the warmer parts of the State.

This re-distributional impact is reflected in the fact that presently, the average rate paid by PG&E's customers is fairly consistent across the populous climate zones (see Tables 1 and 2 below). The fact that the average rate in the coastal zones is almost exactly the same as in the inland zones is particularly noteworthy, considering that inland customers use significantly more energy due to summer air conditioning use. In fact, the average rates paid by Central Valley customers are slightly lower than PG&E's system average, while customers living on the coast pay slightly higher than average rates. Given that inland customers cause higher system costs due to summer air conditioning use, coastal customers are subsidizing inland customers as a result of the revenue-shifting effects of California's climate-zone-based baseline system. And this geography-based subsidy helps to keep bills affordable for Californians living in the inland regions who rely on air conditioning to stay comfortable in the summer months.

Table 1: PG&E Average Rates by Climate Zone (Basic, Non-CARE)
Jan-Dec 2011

Basic	Non-CARE	Households	Adjusted (1) Households	Total Usage	Revenue	Average Total Rate
P	Basic	55,000	56,163	374,053,412	$67,707,832	$0.181
Q	Basic	1,045	1,056	8,246,925	$1,914,976	$0.232
R	Basic	235,079	237,846	1,829,873,102	$338,716,458	$0.185
S	Basic	453,596	460,042	3,391,343,386	$618,966,250	$0.183
T	Basic	746,804	757,090	3,290,476,915	$617,593,931	$0.188
V	Basic	27,016	27,699	168,886,075	$35,619,135	$0.211
W	Basic	118,778	119,667	964,231,831	$180,576,217	$0.187
X	Basic	1,204,188	1,225,513	7,714,878,963	$1,429,981,768	$0.185
Y	Basic	18,246	18,584	95,135,204	$18,018,809	$0.189
Z	Basic	1,999	1,999	6,079,204	$1,119,137	$0.184
TOTAL	Basic	2,861,752	2,905,658	17,843,205,017	$3,310,214,513	$0.186

(1) Households are adjusted to reflect the fact that master meter CARE schedules ESL and ETL include both CARE and non-CARE households. Nearly two-thirds of such households are non-CARE. No adjustment is made to usage or revenues. Source: PG&E.

Average rates for CARE customers are also relatively harmonized across climate zones. See Table 2.

Table 2 PG&E Average Rates by Climate Zone (Basic, CARE)
Jan-Dec 2011

Basic	CARE	Households	Adjusted (1) Households	Total Usage	Revenue	Average Total Rate
P	Basic	24,600	23,438	188,351,154	$16,860,312	$0.090
Q	Basic	91	80	1,251,163	$121,630	$0.097
R	Basic	197,941	195,175	1,563,992,189	$139,173,854	$0.089
S	Basic	228,588	222,142	1,675,388,129	$148,694,392	$0.089
T	Basic	242,878	232,592	1,103,667,316	$98,705,201	$0.089
V	Basic	17,235	16,552	141,726,933	$13,052,581	$0.092
W	Basic	103,392	102,503	806,797,433	$71,461,086	$0.089
X	Basic	328,126	306,801	1,899,870,925	$168,923,070	$0.089
Y	Basic	5,502	5,164	42,333,404	$3,833,605	$0.091
Z	Basic	95	95	524,121	$48,328	$0.092
TOTAL	Basic	1,148,447	1,104,541	7,423,902,767	$660,874,059	$0.089

Put another way, the current baseline allowances, which vary by climate zone, promote regional equity in average rates. Eliminating the current baseline structure would result in a wealth transfer from areas with peakier load factors (the inland hot zones) to areas with flatter load factors (the Coastal zones). Customers in the inland hot zones would face higher bills, which would in turn jeopardize affordability and thus the policy goal of universal service.[40]

4.2.2.2 Increasing Block Rates Support Conservation

The current residential rate design with increasing tiered rates provides lower rates to customers who use less total energy in any month. PG&E's current E-1 rates are as follows:

[40] Because air conditioning load is closely correlated with summer peak load, any critical peak pricing tariff targeting on-peak load reduction undermines this distributional impact of baseline quantities set by climate zone.

Table 3: PG&E E-1 Residential Rates ($ per kWh)

Quantity	Price
Baseline Usage	$0.12845
101% - 130% of Baseline	$0.14602
131% - 200% of Baseline	$0.29940
201% - 300% of Baseline	$0.33940
Over 300% of Baseline	$0.33940
Total Minimum Charge Rate ($ per meter per day)	$0.14784

Baseline quantities, in kWh per day, differ by baseline territory (climate zone), by summer and winter, and by "basic" versus "all-electric" homes.

In simple terms, the incentive given by increasing block rates is that higher consumption is accompanied by a higher rate. Each additional kWh in tier 3 and above costs more than the average rate (see Table 1 for average rates). By the same token, each kWh saved provides a high reward, thus guaranteeing a large incentive to conservation. For a customer in tier 4 contemplating the purchase of an energy-efficient appliance or the installation of a solar system, each kWh saved is worth 33.94 cents/kWh.

Several studies have confirmed that increasing block rates support conservation.

- "Based on empirical estimates of price elasticity from a number of different sources, inclining block rates can provide energy consumption savings in the 6 percent range over a few years and even higher savings over the long run."[41]
- In 2007 BC Hydro also proposed a residential inclining block (RIB) rate design to support conservation efforts (moving from flat rates for electricity). A review of 105 peer- reviewed papers on electricity demand

[41] Ahmad Faruqui, "Inclining Toward Efficiency," Public Utilities Fortnightly, August, 2008, P.26

suggested a conservative short-run price elasticity of -0.075 to -0.15 for this winter-peaking utility.[42]

Use of increasing block rates for conservation is widely accepted in the water industry. "Properly designed increasing block rates recover class-specific, cost of service while sending a more conservation-oriented price signal to that class."[43] In 2008 the CPUC implemented increasing block rates for class A[44] water utilities in order to promote water conservation.[45]

4.2.2.3 A Rate Design with No Customer Charge Supports Conservation

Utilities *always* prefer to have higher customer charges and lower volumetric charges. High fixed charges minimize revenue volatility caused by demand fluctuations and result in more stable and consistent monthly revenues. High customer charges also reduce competition from distributed generation including solar, energy efficiency, and alternative fuel sources (gas versus electric water heating, for example).

Conversely, no customer charge means more costs flow into volumetric rates, which creates a larger conservation incentive due to higher marginal and average volumetric prices. Furthermore incentives for energy efficiency to counter market imperfections must be bigger under a design with high customer charges and low energy charges, because there is a longer payback period.

Furthermore a rate design with customer charges and lower volumetric charges means that it is more difficult to justify building and appliance standards that will

---

[42] BC Hydro, Residential Inclining Block Rate Application, Final Argument, Project 3698504, July 9, 2008, P. 21. Testimony of Dr. Ren Orans: "The utilities that are encouraging or seeking to encourage conservation and are spending large amounts on DSM and programs, where there is market failure, have tried to tilt their rates upwards so they have inclining block rate structures." P. 74

[43] American Water Works Association, *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices M1*, 2000 edition, p.99. See also http://www.awwa.org/Resources/topicspecific.cfm?ItemNumber=3649&navItemNumber=3650.

[44] Class A water utilities serve 10,000 customers or more.

[45] See, D.08-02-036. See also CPUC Report to Legislature, "Progress and Achievements Towards Water Conservation Goals PUC § 2714.5."

promote conservation. Such a rate design policy works against one goal implemented by the California Energy Commission. Similarly the goals of reducing greenhouse gases, through lower energy consumption of fossil generation, are made more difficult with customer charges and lower volumetric rates. In summary, allowing a customer charge goes against California's policies supporting energy conservation, building and appliance standards, and greenhouse gas reduction.

High customer charges also may result in a cross-subsidy from low-usage customers to high-usage customers. Because a large portion of distribution costs are related to demand, a significant portion of the costs for substations and primary distribution feeders are related not to the existence of customers but to the demand of the customers that are being hooked up. By charging these demand-related costs on a fixed basis to all customers, smaller customers within each customer class are being unfairly overcharged and large customers are being undercharged.[46]

TURN recommends against any residential customer charges, even though they might be argued to be "cost based," because they contravene the conservation policy which we hold as a higher priority.

4.3 Dynamic Pricing: Minimal Impacts on Peak Shaving, Adverse Impacts on Universal Service

4.3.1 Introduction

Although dynamic pricing rate designs, such as critical peak pricing (CPP) or peak-day pricing (PDP), are lauded for their potential to reduce on-peak demands, we present evidence below that these rates are a) likely to provide smaller load reductions than expected, b) create adverse impacts on customer bills, c) adversely affect the goals of universal service and rate balance among regions, and d) have unintended interactions with conservation goals. TURN does not support default dynamic rates for residential customers.

---

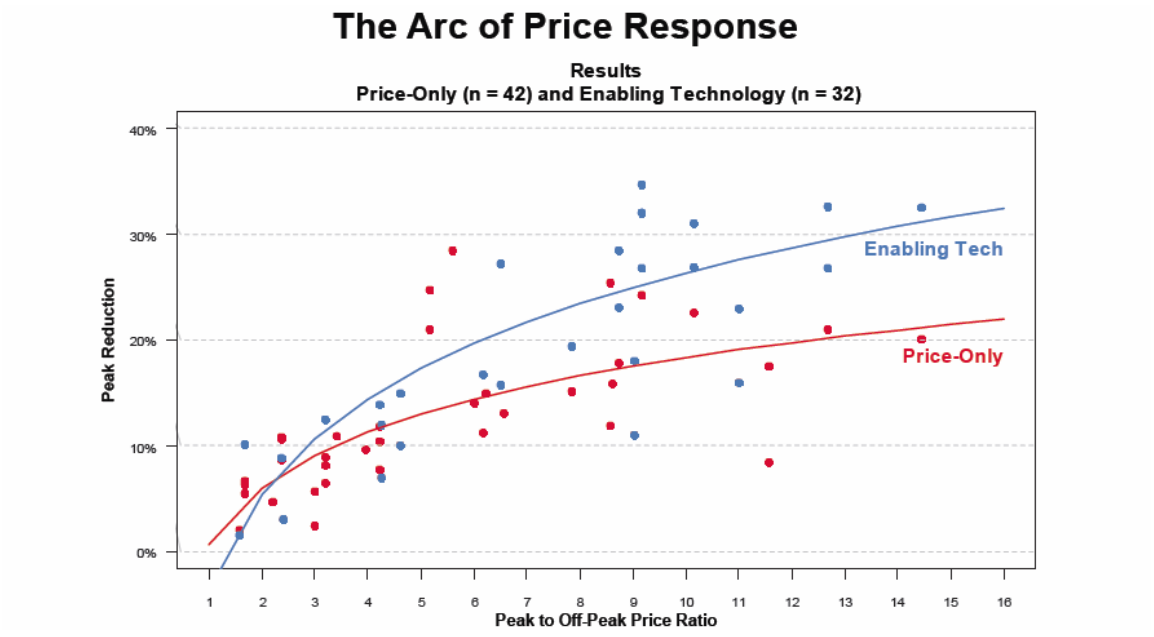
[46] A similar phenomenon can occur with customers in small versus large houses, where the latter have a disproportionately larger demand. See Testimony of William B. Marcus on behalf of the Bureau of Consumer Protection in Nevada PUC Docket 99-4005, November, 1999.

Nevertheless, TURN recommends that *if* the Commission is intent on pursuing this policy for the residential sector, it should adopt PTR rates for at least 2-4 years prior to introducing any PDP rates. "Reward pricing" is equitable and avoids the harmful unintended consequences that result from "penalty pricing."

4.3.2 Dynamic Pricing Is Likely to Offer Only Minimal Peak Savings, with Adverse Consequences.

Evidence from 126 pricing experiments demonstrates that customers respond to the electricity price by reducing consumption. There is an "arc of responsiveness" showing that demand response rises with the ratio of peak to off-peak price, but at a decreasing rate.[47] This evidence leads some economists to conclude that default rate design for residential customers in California should reflect marginal costs and reflect some time-varying pricing.[48]

Figure 2 Peak Reduction and Peak/Off-Peak Price Ratio



---

[47] Ahmad Faruqui and Jenny Palmer, "The Discovery of Price Responsiveness – a Survey of Experiments involving Dynamic Pricing of Electricity," submitted to the EDI Quarterly, 2012.

[48] A. Faruqui, "California's Search for a Better Rate Design," CFEE Rate Design Workshop, March 6, 2012, p. 13-14.

Source: A. Faruqui, CFEE Rate Design Workshop, March 6, 2012, p. 12. Based on 74 pricing tests across three continents during the past decade.

This is basically an argument based on potential efficiency gains. As will be shown below, the expected gains from dynamic pricing are likely to be small, however, and outweighed by undesirable effects on customer bills, universal service, and conservation goals.

4.3.2.1 Benefits are Unlikely to Be Realized

As noted by DRA, hourly wholesale market prices on the CAISO day-ahead market have shown reduced volatility in recent years. On-peak rates proposed for CPP do not reflect current marginal costs, but rather predetermined levels "often 5 to 10 times greater than the average per kWh price."[49] These CPP rates do not necessarily reflect market forces, and may not even be based on defensible marginal cost analysis.[50] [51] Thus these factors do not support an argument for dynamic rates based on an expectation of higher economic and societal efficiency.

Furthermore, proposed CPP rates cannot be expected to result in significant peak savings. Currently for PG&E's existing SmartRate customers (CPP) who consume enough kWh to put them into tier 4 or 5 (and therefore have load to drop), the peak period price is roughly 94 cents/kWh and the peak to off-peak price ratio is less than 3 to 1.[52] Following the "arc of responsiveness" as shown in Figure 2, we would only expect peak reduction of around 8% or less.[53]

---

[49] Robert Levin, DRA, "Time-Variant Pricing for California's Small Electric Consumers, May 2011, p. 16.

[50] Ibid., p. 17.

[51] PG&E's currently proposed PTR-a rate is a credit of $75 cents/kWH, and the PTR-b rate, a credit of $1.25 cents/kWh. PG&E 2010 Rate Design Window, Updated Residential Peak Time Rebate Proposal, Updated Prepared Testimony, A.10-02-028, October 28, 2011, P. 33-34.

[52] Freeman, Sullivan & Co., "2011 Ex Post Load Impact Evaluation of Pacific Gas and Electric Company's Residential Time-Based Pricing," (SmartRate and TOU) Draft, March 22, 2012, p. 7.

[53] Actual savings from PG&E's SmartRate from this opt-in group of customers was roughly a 13% load reduction or 0.24 kW on average. Ibid, p. 2. In its AMI

Given the limit of 15 peak-day events per year, with each event limited to a maximum of 5 hours, the peak day prices would be in effect for only 75 hours of the year. The impact on *annual* net consumption and *annual* bills is therefore limited: "[h]owever, by itself, dynamic pricing is not likely to have much of an impact on overall energy consumption, since the high prices prevail during critical-pricing periods only. For the same reason, it cannot make a huge dent in customer bills."[54]

Thus under conditions currently prevailing in California, instituting default dynamic pricing for residential customers will have only minimal effects on: a) peak demand reduction, b) increased economic efficiency, c) increased conservation or d) reduced customer bills.

4.3.2.2 Potential Adverse Consequences

Not only are the alleged benefits of dynamic rates unlikely to be realized, there may be adverse consequences of such default rates due to many factors.

4.3.2.2.1 Some Customers Will Lose Financially

Some customers will be worse off financially under dynamic rates. Of the 3000 customers to whom PG&E still offered bill protection on its voluntary SmartRate in 2011, 11% were worse off under the dynamic rate and received refunds.[55] Of the 15,780 customers covered by bill protection in 2010, 14% got refunds.[56] PG&E itself acknowledged the risk that some PDP customers might not offset their energy savings with financial benefits.[57]

---

application PG&E expected that customers would be able to save 10% on their bill if they saved 25% of their peak energy (A.05-06-028, PG&E-6, p. 1-10).

[54]Ahmad Faruqui, "Inclining Toward Efficiency," Public Utilities Fortnightly, August 2008, p. 23. This conclusion is not, however, controversial. The utilities have confirmed in their sworn testimonies that the impact of CPP on annual consumption, bills and emissions are limited. This does not mean that there are not significant daily impacts on consumption, or daily and monthly impacts on bill volatility.

[55] Freeman, Sullivan & Co., ibid, p. 40.

[56] Freeman, Sullivan & Co., "2010 Load Impact Evaluation of PG&E's Time-Based Pricing Tariffs," Final Report, April 1, 2011, P. 71.

[57] PG&E, Prepared Testimony of Janice S. Berman in support of A.10-08-005, p. 1-3 and 1-4.

It is important to remember a basic finding from the SPP research, that protection from risk is a bigger customer value than equivalent savings. Customers care more about potential bill increases than about potential bill savings.[58]

Those that are likely to be worse off under dynamic rates are customers with "peakier" loads than average,[59] which can also be described as a "worse than average load factor." These customers are precisely those that have more load potential to drop, but for whom features of the CPP or PDP rates work against them. For some load shapes, the customer starts out "in a hole" under CPP rates compared to the existing tiered rates, and even though she saves on-peak energy, she cannot dig "out of the hole" enough to actually save money under CPP rates – rather she is worse off under CPP.

Customers with worse-than-average load factors, which are likely to suffer with dynamic rates, are those in hotter climate zones, such as PG&E's zones R and S (Mountain/Desert and Valley). These are also areas with larger baseline allowances. It is thus imperative that in any contemplation of changing the rate design, at least the baseline component be retained, because that is what supports the goal of Universal Service by assuring that there are not large transfers from one region to another due to climate. This is even more important under dynamic rates, but retention of baseline rates is still not sufficient to prevent customers with peakier loads from losing financially under dynamic rates.

The "winners" under dynamic or CPP rates are those with flatter than average load shapes, such as customers in the coastal region.[60]

---

[58] "Understanding Some Potential Implications of the Existing SPP CPMR Research for PG&E," Draft, April 25, 2005 slide 14-15.

[59] See Nahigian, Schilberg and Marcus, "Analysis of PG&E's Proposed Advanced Metering Infrastructure Application," on behalf of TURN, A.05-06-028, January 18, 2006, p. 43-51.

[60] S. Borenstein, "Customer Impacts of Potential Changes in Residential Electricity Tariffs," CFEE Conference, March 6, 2012, p. 15.

4.3.2.2.2 Absent Technology Dynamic Rates Won't Sustain Customer Interest and Behavioral Change

Customer bill savings under CPP rates, if any, are generally small, less than $10 per month. Monthly savings of this magnitude are unlikely to sustain customer interest over the long term, especially if it requires on-going behavioral modification. Data from PG&E's current voluntary SmartRate (CPP) indeed show a decline in the percentage of savings over time, for both CARE and non-CARE customers as shown in Table 4. The average reference load for these participants was relatively small, under 2 kW before the demand response, and the response averaged 0.25 kW over the 5-hour events.

Table 4: PG&E % Demand Reduction under SmartRate

	2008	2009	2010	2011
Percent Reduction				
non-CARE	22.6%	22.7%	21.4%	20.1%
CARE	11.0%	7.5%	6.6%	7.2%

Source: Freeman, Sullivan, & Co "Ex Post Load Impact Reports" for 2008-2011

Some parties claim that price impacts will be improved by feedback to customers about their energy use. These hopes, however, are not proving to be cost-effective. The current assessment of consumer behavior is that customers want information and input to their energy use, but not too much information – more like the option to switch technology settings occasionally. "Yes, customers want control, but they want cruise control."[61] Evidence shows that the customer response to information feedback alone has been minimal. An ACEEE study reviewing nine feedback pilots in the US and Europe concluded that feedback provided an addition of 3.8% to savings, but at a significant cost.[62] This result is disappointing to the business case for home energy networks and the

---

[61] Jesse Berst, "Harris poll: Consumers not as apathetic as we think?", SmartGrid News.com, March 14, 2012. http://www.smartgridnews.com/artman/publish/End_Use_Smart_Homes/Harris-poll-Consumers-not-as-apathetic-as-we-think-4573.html.

[62] Ben Foster and Susan Mazur-Stommen, "Results from Recent Real-Time Feedback Studies," ACEEE Report Number B122, p. iii –iv.

expectation that consumers respond to energy information, and is further substantiation that customers want cruise control rather than ongoing detailed feedback.[63]

In another example, Google ceased its home energy dashboard application[64] after a pilot with its tech-savvy employees showed participation and interest fell off after 4 weeks.[65] Microsoft also left the market for home energy information.[66] The recent SMUD study found that energy information, either at the home or appliance level, did not enhance demand responsiveness on event days.[67]

This evidence points to the conclusion that relying on customers to respond to energy information and prices to obtain demand response is a weak link. Small bill savings are not enough to sustain customer behavioral changes over time.

4.3.2.2.3 Customer Confusion and Resistance

It is incorrect to allege that customers know nothing about the relation of their electricity consumption to their bills.[68] Research under California's Statewide Pricing Pilot demonstrated that, while customers do not understand what a kWh is, they

---

[63] Jesse Berst, "Smart Grid momentum: Think less about people more about devices." SmartGridNews.com, March 6, 2012. In comments on this article, industry participants generally agreed with this view. http://www.smartgridnews.com/artman/publish/Technologies_Home_Area_Networks/Smart-grid-momentum-Think-less-about-people-more-about-devices-4533.html.

[64] "We're pleased that PowerMeter has helped demonstrate the importance of this access and created something of a model. However, our efforts have not scaled as quickly as we would like, so we are retiring the service." (http://googleblog.blogspot.com/2011/06/update-on-google-health-and-google.html?m=0#!/2011/06/update-on-google-health-and-google.html

[65] Foster and Mazur-Stommen, ibid., P. 11

[66] "The feedback from customers and partners has remained encouraging throughout Microsoft Hohm's beta period. However, due to the slow overall market adoption of the service, we are instead focusing our efforts on products and solutions more capable of supporting long-standing growth within this evolving market" (http://blog.microsoft-hohm.com/news/11-06-30/Microsoft_Hohm_Service_Discontinuation.aspx

[67] Herter Energy Research Solutions, Inc., "SMUD's Residential Summer Solutions Study," February, 2012, P. 56

[68] A. Faruqui, "California's Search for a Better Rate Design," CFEE Rate Design Workshop, March 6, 2012, p. 3.

understand that the more electricity they use, the higher the rate. Several conclusions are worth noting:[69]

- Nearly every respondent has some notion that the amount they are billed for electricity has something to do with the amount of electricity they use and that air conditioning is an important driver of electricity use. Beyond this, however, most customers cannot explain the details.

…

- Because of all of these issues, and further, because customers assume that significant reductions in energy use would necessarily require significant reductions in convenience and comfort – and they tend to like their current levels of convenience and comfort – most would rather not endure the sacrifices they assume would be necessary in order to gain the reward of a noticeable reduction in electricity costs.

This potential loss of consumer comfort, as well as the increase in customer hassle to respond to pricing information (and to enroll family members to comply also) is generally not mentioned when lauding the efficiency "gains" that will accompany dynamic pricing. These pressures, however, can add to consumer stress over electricity bills and resistance to rate changes, especially if the financial savings are small. A Focus Group study by Sempra regarding possible TOU or CPP rates with a 90 cents/kWh critical peak price found that "[m]any claimed they would need to anticipate saving at least 10%, and possibly as much as 25%, each month on electricity to make adjusting their usage behavior worthwhile…Simply put, the likely savings struck respondents as hardly worth the effort."[70]

It is also inconsistent to claim that customers do not understand the current electricity pricing based on increasing tiers, but that they would track more closely a system based on "marginal costs,"[71] a concept unknown to most customers.

---

[69] Momentum Market Intelligence for Southern California Edison, Pacific Gas & Electric and San Diego Gas and Electric, "Residential Customer Understanding of Electricity Usage and Billing," September-October 2003, p. iv-v.

[70] Quoted in Marcus, Nahigian and Schilberg, "Analysis of San Diego Gas and Electric's Advanced Metering Infrastructure Application," A.05-03-015, August 14, 2006, p. 74

[71] Faruqui, ibid. p. 3 and 13-14,

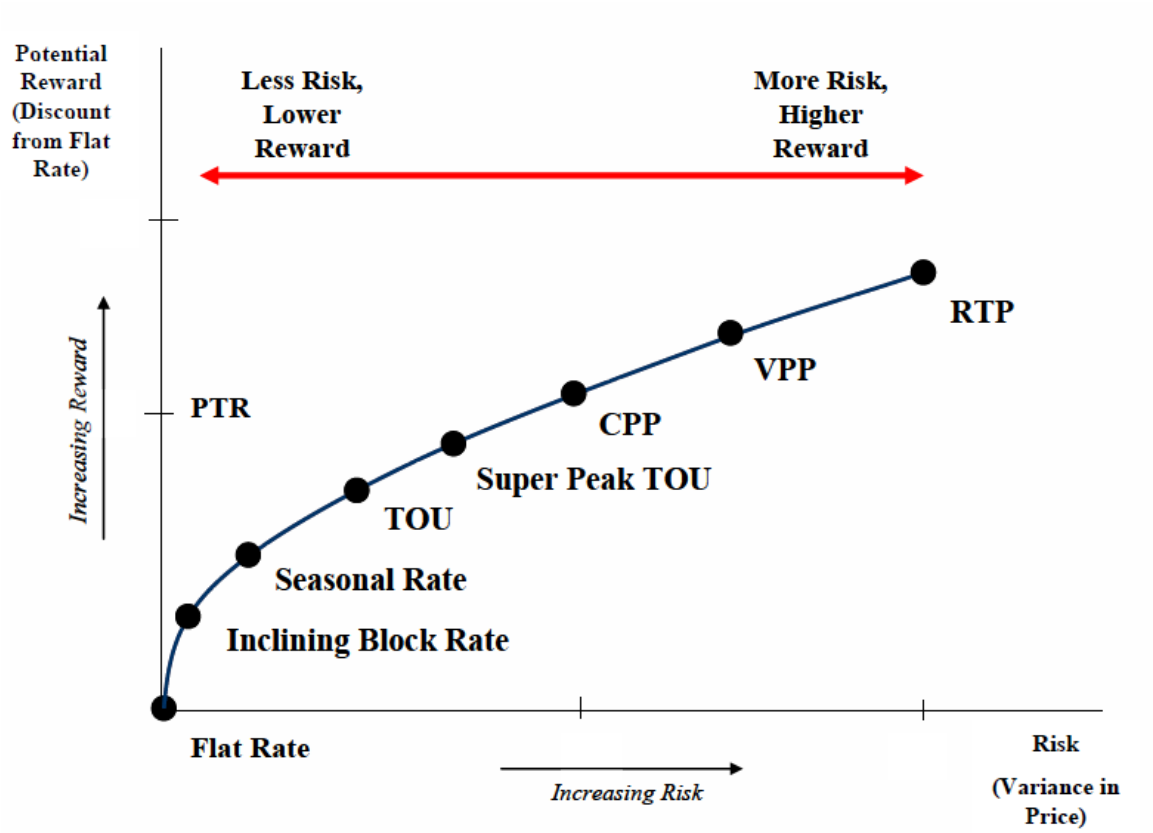
We thus caution against implementing rate changes where customers face little financial gain and more hassle. There can be undesirable consequences from such a move.

4.3.2.2.4 Increased Risk for Residential Customers

Compared to flat or tiered rates, time varying rates offer customers the potential for a higher reward (savings), accompanied by higher risk. This is illustrated by Figure 3. Proponents of time-varying pricing argue that under flat rates, the utility assumes the risk of wholesale price volatility, and charges customers for it. Under real time pricing (RTP), the customer assumes all the volatility, and in exchange gets a lower cost of service (with no hedging premium paid to the utility).[72] Other time-varying rate designs, such as TOU or CPP, are in between.

[72] IEE Whitepaper on *The Impact of Dynamic Pricing on Low Income Customers*, A. Faruqui, S. Sergici, and J. Palmer, September, 2010, p. 4.

Figure 3: Risk and Reward Trade-off with Time Based Rates



Source: IEE Whitepaper on *The Impact of Dynamic Pricing on Low Income Customers*, September, 2010, p. 4.

While this may be a theory of interest for large customers who prefer to take on the hedging risk themselves, it is not of relevance for residential customers who are basically risk averse for electricity bills.[73] Results from the California Statewide Pricing Pilot (SPP) provide ample evidence that customers do not want the risk of bill increases,

[73] It is noteworthy that this diagram appears in a paper ostensibly concerned with low income customers, a customer group for whom it is probably the least relevant. This pursuit of academic purity in a context where it ignores the bigger issues at stake pervades the whole discussion of dynamic pricing.

and are not even that excited about bill decreases if it involves effort and discomfort. The following results from the SPP were specific to PG&E's customers:[74]

- Protection from risk is a bigger customer value than equivalent savings. A 10% bill increase is more negative than a 20% savings is positive. (April 25, 2005, slide14).
- A given percentage bill savings is valued more by customers in hotter climate zones. (April 25, 2005, slide 14). Since customers in hotter zones have higher bills, this finding can be understood to reveal that customers value higher savings in absolute dollars.
- Customers in zones 2-4 (e.g. zones X, S, and R) preferred no load drop and no bill reduction to doing maximum load drop and receiving 20% bill reduction. (April 25, 2005, slide 15). Although the study did not articulate this conclusion, it is apparent from the customer preference results.
- Customers care more about potential bill increases than about potential bill savings. (April 25, 2005, slide 15).
- Doing maximum load drop and receiving only a 10% bill reduction produced a sizeable **negative** reaction from customers in zones X, S, and R (April 25, 2005, slide 15).
- The most important reason for signing up is to save money. (June 2005, p.10)

For the Commission to contemplate a default rate design that increases the level of risk for customers will not be a popular move. From the point of view of a customer who is risk adverse and may already be having difficulty paying existing bills, there is no benefit to taking on more risk so that a hedging premium does not need to be paid to the utility. If customers wish to take on more risk, they can do so on a voluntary opt-in basis.

---

[74] Momentum Market Intelligence , "Understanding Some Potential Implications of the Existing SPP CPMR Research for PG&E, Draft, April 25, 2005, and "Customer Preference Research on Rates and Metering Data," June 2005.

4.3.2.3 Dynamic Pricing Gives Low Quality Demand Response

A critical peak price with a day-ahead notice is a relatively blunt instrument for delivering demand response. Essentially the price will deliver whatever response ends up being available. At the most it will avoid the costs of day-ahead energy from the MW of DR that can be statistically estimated from previous experience that would be valued through the MRTU bids and resource adequacy capacity (to the extent that load reduction can be forecast to persist over four hours).

The timing of when reductions occur during critical peak hours is also questionable. Many customers who are trying to respond to the price signal may pre-cool before the event and/or may raise the thermostat, and then let their home coast upward in temperature for a period of time. But when the temperature reaches the thermostat level, the air conditioner will come on. As a result, there is a strong potential that thermostat-based load response will be concentrated in the early hours of the program and will tail off later in the day.[75] Evidence shows that there is a "snapback" effect, as the event period ends and recovery of the desired comfort level begins, and the consumption exceeds what it would have been absent the pricing program.[76] In the past this effect has led to concerns about increasing the peak on the distribution system around 7 pm.

4.3.2.4 To Achieve Reliable Demand Response, Technology May Be Better Than Dynamic Pricing

By comparison, technology-based solutions provide firmer demand response than a pricing program. An air conditioner load management program can deliver demand response much more predictably, for a pre-specified number of minutes per hour, and with the ability using both computer and advanced metering technology to shape the demand response.

---

[75] Studies of Programmable Communicating Thermostats (PCTs) for Pacific Gas and Electric Company's residential customers and Southern California Edison's small commercial customers suggest that this point is likely to be valid. From PG&E, Draft Report, AB 970 Program Summaries, November 2006, p.4. RLW Analytics for Edison, "Impact Evaluation of the 2004 SCE Energy$mart Thermostat Program, Summer Initiative Expansion," February 15, 2006, p. 3.

[76] Freeman, Sullivan, & Co., "2011 Ex Post Load Impact Evaluation" (SmartRate and TOU), Draft, p. 26.

In support of the Commission's goal for peak-shaving and demand response, we submit that residential demand response programs with technology might work better than dynamic rates. Air conditioner cycling allows a customer to choose once ("cruise control"), to install a cycler to turn a machine off for 20 minutes per hour on a dozen hot days in exchange for a periodic rebate. This is a lot easier for many people than trying to learn when a critical peak day is happening and how much costs will rise on a critical peak day so they can make a number of additional choices whether or not to make behavioral adjustments on that day.

PG&E's most recent Ex Post Load Impact studies confirm this conclusion. The average savings for the SmartRate (voluntary CPP) were 0.25 kW per event over the summer, whereas the average savings for the SmartAC program (with technology) were 0.5 kW.[77]

A programmatic engineering-oriented response, such as air conditioner load management and other aggregation programs, can deliver energy and capacity that meets a more defined schedule than whatever a price responsive program ends up producing. These programs (particularly with switches rather than thermostats) can be more fine-tuned to deliver energy more evenly over the course of an entire critical peak period and can also be designed to deliver other higher value services required by the California Independent System Operator (ISO) such as non-spinning reserves, ramping across an hour, and instructed incremental and decremental energy in minute-to-minute time scales (if needed to integrate renewables or meet unusual load conditions). Aggregation can also be used to target specific areas where peak loads would cause the need to add to transmission, distribution substations, and distribution feeders. Edison has also used air conditioner cycling to reduce loading on line transformers on very hot days.

4.3.3 Dynamic Rates Could Adversely Affect Universal Service

4.3.3.1 Dynamic Rates Affect Vulnerable Populations

Dynamic rates can adversely affect low income and other vulnerable customers.

---

[77] Freeman, Sullivan, & Co., "2011 Ex Post Load Impact Evaluation" (SmartRate and TOU), p. and 2 (SmartAC), p. 4.

4.3.3.1.1 Low Income Customers

A recent study from the Edison Foundation's Institute for Electric Efficiency ("IEE") claims that low income customers are responsive to dynamic rates and that many such customers can benefit even without shifting load.[78] However results more specific to California showed that lower income customers were slightly less responsive to CPP rates compared to higher income customers, and specifically in PG&E's territory the lower income customers were only half or a third as price responsive as the higher income group.[79] Table 4 above shows that the percentage savings of PG&E's CARE customers under its voluntary SmartRate (CPP) has remained at roughly 1/3 of the percentage of non-CARE customers for 2009-2011. A disproportionate number of CARE customers signed up for PG&E's voluntary SmartRate (CPP) program in 2008, possibly because they were offered a $50 Visa card, and because "CARE customers have apparently developed a belief that most new offers from PG&E will reduce their energy costs."[80] Clearly financial consequences are paramount for this group.

The IEE paper also provided simulations of how low income customers would fare under CPP rates, based on sample load shapes from an unnamed large urban utility. The paper concludes that 65 to 79% of the low income customers would have bill decreases under CPP rates.[81] This result, however, is in effect a tautology – a reflection of the underlying assumptions about low income load shapes and existing rate design, rather than a profound conclusion.

Other experts have revisited and refined the conclusions of the IEE Whitepaper.[82] The conclusion that a majority of low income customers can benefit from CPP is

---

[78] IEE Whitepaper, by A. Faruqui, S. Sergici and J. Palmer, "The Impact of Dynamic Pricing on Low Income Customers," September, 2010, p.1.

[79] Ibid, p. 14.

[80] Freeman, Sullivan, & Co., "2008 Load Impact Evaluation for PG&E's SmartRate, SmartAC and Residential TOU Programs," May 1, 2009, P. 9.

[81] Two CPP designs were analyzed– one with a CPP rate of $1.25/kWh for the 4-hour peak from 2-6 pm, and the other with a CPP rate of 90 cents/kWh for a 5-hour period from 2 pm to 7 pm, for 15 critical days.

[82] Nancy Brockway and Rick Hornby for the Maryland Office of the People's Counsel, "The Impact of Dynamic Pricing on Low-Income Customers: An Analysis of the IEE Whitepaper," November 10, 2010.

completely dependent on the input assumptions. In addition it is not warranted to simply assume, as the IEE paper does, that half the residential customers of a utility would have load shapes flatter than average (and thus benefit from CPP rates), and half have peakier than average load shapes.[83] An example from a New Jersey utility showed that 50% of residential customers have demand much less than average (much flatter load shape), 30% somewhat peakier than average, and only 10% are very peaky.[84] Indeed analysis presented by TURN in a past PG&E proceeding showed a similar finding that:

- Most of PG&E's residential customers are small users in moderate climate zones. Of PG&E's residential customers, 85% would receive no or only muted price signals under CPP rates.[85]
- Almost half of the customers with better-than-average load shapes are in PG&E's climate Zone T (Coastal), and could become free-riders under CPP rates.[86]
- PG&E's residential critical peak pricing (CPP) program is based on a rate design that requires a subsidy from others in the class. If all customers participated there would be an average monthly shortfall of $3.89 per customer. In the tables and charts below this looks like a bill savings, but in reality the revenue shortfall will necessitate higher rates to recover this amount.[87]

In any move to CPP rates, focus also needs to be placed on the low income customers who are worse off as a result of the rates. While intending to show that a majority of low income customers could benefit from CPP rates, the IEE paper does not discuss the consequences for the 35 to 21% of low income customers that receive <u>higher</u> bills under CPP rates (by design), for whom the bill increase could pose a greater problem than for non-CARE customers.[88] In the simulation in the IEE Whitepaper, at

---

[83] Ibid, p. 3.
[84] Ibid., p. 4.
[85] Nahigian, Schilberg and Marcus, "Analysis of PG&E's Proposed Advanced Metering Infrastructure Application," on behalf of TURN, A.05-06-028, January 18, 2006, P. 40.
[86] Ibid., p. 48.
[87] Ibid., p. 39.
[88] Trevor R. Roycroft, "The Impact of Dynamic Pricing on Low Income Consumers: Evaluation of the IEE Low Income Whitepaper," November 29, 2010, p. 9.

least 10% of low income customers could experience bill impacts as high as 10% or more, which would be unsustainable for low-income customers.[89]

It is important to note that low income customers generally spend a larger proportion of their income on electricity than other households. Furthermore, these customers have a higher penetration of older appliances, and cannot afford to purchase new efficient ones.[90] Both of these reasons support the conclusion that rate increases weigh disproportionately on these customers.

The conclusion of the Brockaway/Hornby review of the IEE Whitepaper is important:

> In the debates over the value of smart metering and dynamic pricing for customers of various utilities, the IEE Whitepaper has been and will be cited as proof that low-income customers have nothing to fear from the implementation of such policies. A closer look at the paper reveals that, however much the general conclusions of the IEE Whitepaper may approximate reality in some situations, the Whitepaper does not lay to rest the concern for impacts on low-income customers.[91]

4.3.3.1.2 Other Vulnerable Groups

Extra care also needs to be taken for the needs of customers with medical or other requirements that necessitate electricity consumption during critical peak periods. Those that require pumped oxygen, air conditioning or filtering, or refrigerated medicines should not be penalized by rate design for consumption on-peak. Section 745(d)(2) already exempts medical baseline and third-party notification customers from any default time-variant pricing.

Some vulnerable customers may undertake extreme conservation to comply with on-peak alerts, sometimes even sacrificing their comfort or health.[92] A study of the July 1995 heat wave in Chicago that was accompanied by 739 deaths documented that almost

---

[89] Brockaway and Hornby, Ibid., p. 18.

[90] AARP, National Consumer Law Center, National Association of State Utility Consumer Advocates, Consumers Union, and Public Citizen, "The Need for Essential Consumer Protections: Smart Metering Proposals and the Move to Time-Based Pricing," August, 2010, p. 11.

[91] Ibid., p. 21.

[92] Ibid., p. 19.

¾ of the victims were over age 65, many of whom were afraid to use space cooling for fear of higher electric bills.[93]

In consideration of the needs of vulnerable customers, such as the frail and elderly, poor, socially isolated, and/or infirm, customer advocates recommend that any dynamic rates be voluntary or opt-in, not mandatory.[94]

4.3.3.2 Higher Summer Volatility and Bill Arrearages

It is important to consider monthly and seasonal bill impacts from time-of-use and critical peak pricing. Rate design that concentrates costs in peak months and particularly does so unpredictably, like dynamic pricing, can have big impacts on low income, fixed income, and elderly consumers. Time-based seasonal pricing, especially with CPP events (the number of which may vary from month to month), leads to more volatile and unpredictable bills and thus hardship for those on a tight budget. Even many "winners" on an annual basis are likely to have higher bills in summer (under time-based pricing) and lower bills in winter, leading to the possibility of increased summer arrearages.

The utility remedy for arrearages is budget billing, which will completely blunt the role of a price signal from time-based pricing. Such a budget billing plan could still give customers unpleasant surprises at the end of a billing year in which a larger number of events were called than on which the rate was designed.

Put more simply, residential customers care greatly about bill stability, as well as low bills. And customers interpret rate stability as resulting in bill stability. Even if the annual bill remains almost the same, having a large spike in the monthly bill for August and September results in significant customer outrage and hardship. Not surprisingly, TURN notes that the primary product offered by core transport aggregators to retail natural gas customers is a fixed-price product. Customers value the rate stability since utility commodity gas prices change monthly. We can predict with total certainty that if the Commission offered a slew of electric rate options, and *if* customers could make a

---

[93] Ibid., p. 10.
[94] Ibid.

choice instantly and magically,[95] the vast majority of customers would pick a single fixed rate option and happily pay any "hedging costs" to the utility.

4.3.4 Dynamic Rates can Adversely Impact Conservation Goals

4.3.4.1 No Evidence of Conservation Effects with Dynamic Rates

It is well established that dynamic rates do not promote significant conservation. Under dynamic rates, customers generally shift, rather than reduce, their electricity consumption. This result was found empirically in the California SPP,[96] the CL&P pilot in Connecticut, and the summer pricing pilot of Baltimore Gas & Electric (2008).[97]

A focus on time-variant pricing, as opposed to inclining block pricing, minimizes the conservation impact of rates. Such a default design would focus customers only on when they consume, rather than the total kWh of their electric consumption.

4.3.4.2 A Dynamic Rate Design is a Disincentive to AC Efficiency

An efficient air conditioner that will save a kilowatt every time it is turned on (perhaps 1000 hours per year) without increasing customer discomfort is more valuable to a customer and to society (in terms of minimizing electricity consumption) than a pricing program that might save a kilowatt on 12 hot days a year at the cost of customer discomfort. For this reason we support the goal of conservation and high AC efficiency standards. However, there are several ways in which dynamic rate design undermines these goals.

Demand response pricing and energy efficiency are at least partly substitutes. When a customer installs a more efficient air conditioner, the customer has less AC

---

[95] Though we realize customers will not do this exactly because most residential customers will remain on default rates, as discussed in Section 2 above.

[96] Charles River Associates, Final Report, "Impact Evaluation of the California Statewide Pricing Pilot," March 16, 2005, p. 7 ("There was essentially no change in total energy use across the entire year based on average SPP prices. That is, the reduction in energy use during high-price periods was almost exactly offset by increases in energy use during of-peak periods.").

[97] AARP, National Consumer Law Center, National Association of State Utility Consumer Advocates, Consumers Union, and Public Citizen, "The Need for Essential Consumer Protections: Smart Metering Proposals and the Move to Time-Based Pricing," August, 2010, p. 8.

demand that could be reduced at peak. So if a utility is counting on a kilowatt per average residential customer of demand response on air conditioning loads, it will get only get half or three-quarters as much from someone with a higher efficiency EER 16 model air conditioner compared to a EER 12. In essence, any estimates of demand response from air conditioning must decline over time as the air conditioner fleet becomes more efficient.[98] A utility which is focused on meeting demand response goals will not be interested in encouraging customers to purchase more efficient AC units. TURN does not want to promote such an incentive.

Demand response works best with oversized equipment. On very hot days, a properly sized air conditioner will barely keep up. If cycled off or turned off for critical peak, the temperature could rise considerably for the rest of the day creating discomfort and customer resistance. Customers with properly sized equipment are more likely to drop from a voluntary program and to feel squeezed and penalized if it is mandatory, and to oversize when they buy a new air conditioner. By contrast, oversized equipment – which wastes energy year round – is better able to cool the dwelling when the demand response event is over. Again, TURN does not condone this emphasis on demand response at the expense of higher AC efficiency.

If the Commission chooses to adopt time-variant pricing, it becomes even more critical to integrate air conditioner efficiency and demand response. Customers must be given a well-publicized means of saving money on these rates through a significant expansion of the air conditioner retrofit program, particularly at the highest efficiency levels (in excess of EER 16) with associated quality installation and maintenance programs

4.4 Default TOU: Weakly Supports Conservation and Peak Shaving; Adverse Impacts on Universal Service

4.4.1 TOU Rates Support Conservation and Peak Shaving

Various studies support the finding that TOU rates support conservation and/or peak shaving.

---

[98] D.09-03-026 (PG&E AMI Upgrade), p. 132-133.

4.4.1.1 SMUD Summer Solutions

In a recent SMUD study of residential customers, a sample of customers volunteered for TOU-CPP rates instead of the current two-tiered rate. Of the study participants, 75% chose the rate (with or without automatic load control), no doubt because it was advertised to provide "a 30% discount during SMUD's off-peak hours," which occur more than 90% of the time. The results for the TOU component on non-event days can shed light on peak shaving for this rate design. The "Summer Solutions" rate is shown in Table 5.

Table 5: SMUD Summer Solutions Rate Compared to the Standard Rate

Period	Schedule	Tier	Standard Summer Rate ($/kWh)	Summer Solutions Rate ($/kWh)	% of Time
Event	4:00 - 7:00 p.m.	<700 kWh	$ 0.1045	$ 0.7500	1%
		>700 kWh	$ 0.1859		
On-peak	4:00 - 7:00 p.m. (Non-holiday weekdays)	<700 kWh	$ 0.1045	$ 0.2700	8%
		>700 kWh	$ 0.1859		
Off-peak	All other hours	<700 kWh	$ 0.1045	$ 0.0721	91%
		>700 kWh	$ 0.1859	$ 0.1411	

The off-peak rates under Summer Solutions (SS) are roughly 30% lower than the standard rate (for both tiers 1 and 2). On normal (non-event) weekdays the on-peak rate (from 4-7 pm) is 27 cents/kWh, roughly 2 times the off-peak rate for tier 2 and close to 4 times the off-peak rate for tier 1. For customers on the SS rate only, energy savings of 10.3% were observed (a conservation effect, including both reductions on normal and event weekdays). On-peak reduction of 23% resulted on non-event weekdays.

Several aspects of this study indicate that the size of energy and peak savings might not be replicated in PG&E's territory, if default TOU were to be implemented.

- The 3-hour peak for SMUD is shorter than PG&E's 5-hour peak (for CPP or PTR), thus the same impacts may not be sustained for the longer peak period in PG&E.[99]
- As part of the SMUD study participants were encouraged by email and on the participant website to receive free home energy assessments. One-third of the participants received these assessments, which may have increased their energy savings.
- If smaller price differentials between peak and off peak exist, there can be a smaller incentive for savings.

4.4.1.2 Simulation

Dr. Faruqui reports on a simulation which replaced the inclining block rates in an unnamed utility with a TOU rate (presumably with no baseline allowances or tiers). He reports that this would reduce the residential peak by 5-10%, with no increase in consumption, but presumably no decrease in consumption (e.g. conservation) either.[100]

4.4.2 Adverse Impacts of Default TOU Rates

4.4.2.1 Universal Service

4.4.2.1.1 Bill Impacts

The SMUD study showed that customers on the Summer Solutions rate (which included a TOU as well as CPP component) saved an average of $10 per month due to the conservation effect, and another $10 due to the rate itself.[101] It is also important to note, however, that of those on the Summer Solutions rate (including those who added technology), still 28% would have paid less on the standard two-tiered rate. Thus even among participants who voluntarily chose the rate and their technology preferences, presumably assuming that they would save money, there are winners as well as <u>almost 30% losers</u> (some with bills 20% higher than the standard rate).

---

[99] Because PG&E's climate is far more diverse than SMUD's, it is unlikely that the savings would be observed in all of PG&E's regions.

[100] Ahmad Faruqui, "California's Search for a Better Rate Design, CFEE Rate Design Workshop, March 6, 2012, p. 11.

[101] Herter Research Solutions, Ibid., p. 36.

There is a tradeoff in the TOU rate design, in that the larger the peak/off-peak price differential to encourage peak-shaving, the larger can be the adverse bill impacts. This is a delicate balance in the design of any TOU rate.

Seasonal and geographic bill impacts are likely to also be a factor of TOU rates. TURN's analysis of PG&E's proposed E-6 (TOU) and E-6 (PDP) rates in A.09-02-022 confirmed that many customers were likely to have higher summer bills as a result of the proposed rates. Although different rates were eventually adopted from those proposed, the move from PG&E's E-1 to E-6 (TOU as proposed) would result in summer bill increases from 5.81% to 13.57%, with low income customers living in multi-family buildings in the inland region experiencing the highest increase (13.57%).[102] While winter bill decreases would somewhat offset these summer charges, low-income, multi-family customers living in the inland region would still see annual bill increases that approach 6.32%. A similar pattern was shown in an analysis of the proposed E-6 PDP rates.

4.4.2.1.2 Regional Transfers

If the baseline component of current tiered rates is eliminated, not only will there be adverse bill impacts to individual customers under TOU rates (for example 30% of customers in SMUD's study of one climate zone), but also there could be regional transfers from areas with worse-than-average load shapes (for example hot areas with high AC use), to areas with better-than-average load shapes (for example coastal areas). Some examples of this transfer have been shown in evidence cited above. Because of the varied climates within PG&E's service territory, this impact can be more significant than for SMUD customers.

4.4.2.2 Increases Customer Risk

As shown in Figure 3 above, the TOU rate offers more risk and more potential reward to customers than do current tiered rates. However, as discussed in Section 4.3.2.2.4 above, residential customers are risk adverse, and do not in general value the

---

[102] Testimony of Jeffrey A. Nahigian on PG&E's 2009 Rate Design Window, A.09-02-022, for TURN, July 31, 2009, p. 4.

opportunity to relieve the utility of its hedging function in favor of slightly lower rates. The fact that TOU rates will increase the risk of higher bills for customers will not be seen as a benefit. Customers will feel worse off if the Commission moves to TOU rates on a default basis.

4.5 Peak Time Rebates (PTR)

As stated above, TURN does not support implementation of default dynamic pricing rates for residential customers. These rates would work against our valued goals of conservation and universal service.

However, if the Commission chooses to adopt a time-variant residential rate design, TURN recommends that "reward pricing" can better address rate design goals that "penalty pricing." Our experience with residential customers indicates that customer understanding of tariff designs and electric rates is somewhat low. Customers respond strongly to unexpected bill changes, such as might occur under default dynamic pricing. They also tend to correlate the cause of bill increases with the most obvious change, as evidenced by the large-scale discontent with smart meter installations. Such a reaction can result in backlash and distrust of the technology and associated tariff design.

Rather the preferred way to introduce demand response to those residential customers who are not already on programs, such as PG&E's SmartRate or SmartAC, would be to offer and educate customers about PTR. Because under PTR there will be no bill increases – only credits for on-peak energy reductions – there will be a reduced potential for negative impacts and a maximized potential for success.

Under the PTR rate there is also an incentive for energy efficiency investments. Because the proposed rate credits are 0.75 cents/kWh credit for PTR-a and $1.25 for PTR-b (with technology), a customer facing the choice of an energy-efficient appliance that may run on-peak (for example an AC unit) will have a large incentive (75 cents/kWh plus the avoided tier price) to save on critical peak days. If the customer has an interruption device, the incentive could be as high as $1.59 per kWh ($1.25 cents/kWh plus the tier 4 price of 33.9 cents/kWh). Admittedly these incentives only apply during on-peak hours on critical days, but they send a signal that supports and augments the value of energy conservation, which supports one of our primary rate design goals.

5 The Path Forward

As discussed in the previous sections, TURN values the rate design goals of conservation, universal service, and peak load reduction. Because of this emphasis we support the principles behind the current tiered residential rate design, because it promotes conservation and universal service. The absence of customer charges and increasing block rates promote conservation and the baseline component keeps balance among climate regions.

We do not favor a default dynamic pricing rate design, because it promotes the goal of peak shaving at the expense of other more important goals such as conservation. Both default TOU and dynamic pricing can have adverse impacts on customers' bills, and while experts have estimated that two-thirds of customers might be "winners" under these rate designs, the fact that 1/3 are "losers" as part of the design is very problematic, especially for low income and other vulnerable populations. Furthermore if the baseline component of current rates is eliminated as part of a move toward new default rates, the "losers" would involve regional transfers from poorer and hotter areas, such as the Valley, to richer and cooler areas such as the Coast. These transfers violate our goal of universal service.

At the same time TURN recognizes that the existing residential tiered rates, which have evolved over time in response to the deregulation energy crisis and several legislative mandates, may be unsustainable in the long term. We address potential remedies in the sections below.

5.1 The Current "Problems"

At a recent conference, experts identified various problems with the current residential rate design.[103] We summarize these problems and our initial response below.

- **There is no link between customer actions and bill changes**. This "problem" was not substantiated by SPP research, which showed that

[103] These problems are presented in A. Faruqui, "California's Search for a Better Rate Design," and A. Jazayeri, "Cost Recovery Challenges Faced by California Utilities as They Transform Themselves to Meet California's Long-Term Policy Goals," both presented at the CFEE Rate Design Policy Workshop, March 6, 2012.

customers understand that more consumption means high bills and rates. See the discussion in Section 4.3.2.2.3 above.

- **There are cross subsidies in rates**. Many of these cross subsidies are policy choices, such as for low income (CARE) or low-use customers, and to promote regional equity (universal service). The latter supports economic diversity in California (so that the hotter regions can specialize in agriculture, for example). While academic theorists view this subsidy from "flat" loads to "peaky" loads as a problem because marginal costs are not accurately reflected, the "solution" (e.g. increasing electricity bills in hotter regions and reducing them on the coast) violates Legislative intent as reflected in § 739(a) and does not promote the goal of universal service. TURN does not value the "gains" in terms of efficiency, if any, as worth the costs in terms of regional transfers. See also the discussion in Section 3.1.4. CARE rates are discussed in Section 5.4 below.
- **Net metering can encourage a switch to DG and increased rates to cover fixed costs**. Our suggestions appear in section 5.5 below.
- **Feed-in Tariffs are higher than market price**. See our suggestions in Section 5.5 below.
- **Highest and Lowest tiers are out of synch with costs**. See our discussion in Section 5.3 below.
- **Rates in the upper tiers are not sustainable**. See our discussion in Section 5.3 below.
- **Too many tiers**. See our discussion in Section 5.3 below.
- **Discourages night-time PEVs**. See our suggestions in Section 5.6 below.

The experts proposed the following solutions:

- **Move toward the "law of one price" for buying or selling power**. As stated in Section 3.1.4 above, pricing efficiency is not one of TURN's top priorities. This goal should not be pursued at the expense of universal

service and conservation incentives. The options proposed are complex[104] and the concept of "marginal cost" is not meaningful to customers.

- **Network user charges?** Our comments appear in section 5.5 below.
- **Reduce the number of tiers and decrease the price differential.** See our discussion in Section 5.3 below.
- **Default TOU Pricing.** The impacts on customer bills may be unpalatable.
- **Recover fixed costs via fixed charges.** Our disagreement is discussed in Section 4.2.2.3 above. Increasing fixed charges is a disincentive for conservation.
- **Dynamic Pricing as a target end-state**. TURN disagrees with default dynamic pricing as a goal, for reasons discussed in Section 3.1.5 above. We do not believe the potential drawbacks justify the limited benefits actually provided by time-variant pricing.

To address some of the concerns with current tiered rates, TURN recommends maintaining the existing residential tariff structure (baseline, no fixed charges, and increasing tiers which promote conservation and universal service), while also considering the modifications discussed below in Section 5.3. Any modifications to the current tiered rate structure must continue to reflect a balance of the most significant rate design policy goals advocated by TURN.

5.2 Rate Design is Pragmatic

Different objectives in rate design have very different consequences. These different goals need to be weighed and implemented in a pragmatic, rather than a strongly ideological, manner. To the extent possible the Commission should endeavor to harmonize the competing goals, with the idea of sending policy signals that will promote the well-being of Californians in the next decade. We therefore set forth the following observations:

---

[104] Faruqui, Ibid., p. 14.

- If a regulator is worried mainly about the cost of new power plants and market power in deregulated markets, what happens in the highest 100 hours of load is important. If one believes that if customers just stay out of the peak, the utility should be happy to generate more power for them, then critical peak pricing by itself is your rate design.
- But if the regulatory and societal goal is for people to build better houses, weatherize, make a better choice of heating fuel, buy efficient appliances, some simpler things are even more critical. It is not reasonable to pursue energy efficiency with one foot on the accelerator (ratepayer-funded programs) and the other foot on the brake (rate design that makes those programs less cost-effective). The result will be either less efficiency delivered to customers or higher costs (required to overcome rate design) or both.
- Customer charges blunt the price signals that support energy efficiency. Getting rid of customer charges may move somewhat away from strict cost –of-service principles, but that move preserves and supports the integrity of two other important goals – how much people use (conservation) and when (time of use). TURN supports the latter two principles more than reflecting fixed costs in fixed charges.
- Because competing goals need to be harmonized, we recommend that strict economic efficiency, which calls for accurate reflection of marginal costs in marginal prices, receive a lower weight. There are many factors that insure that residential electric consumption does not fully equate marginal costs and prices as smoothly as economic textbooks would have us believe. (See the reasons in Section 3.1.4). Because of these barriers to perfect efficiency, we doubt that significant efficiency gains are likely from movement toward perfection in marginal cost pricing for residential customers, who have a very low elasticity of price responsiveness anyway.

5.3 Envisioning Alternatives to California's Existing Tiered Rates

As explained above, TURN believes that California's current default residential rate design, with baseline rates, inverted tiers, and the absence of (or only minimal, in the case of SCE) customer charges, should continue to be the default rate design for residential customers. However, TURN also recognizes that reasonable modifications to

the existing tiered rate structure are worth considering, though some of those modifications might conflict with existing statutory requirements.

While TURN is still in the preliminary stage of our consideration of how existing tiered rates might be modified to be more sustainable, we offer the following general attributes of a "preferred" rate design. At this point, TURN suggests that a three-tier, inclining block, residential rate design with more equal tier differentials could continue the benefits of the existing tiered rates, while increasing customer acceptance, reducing confusion (to the extent confusion exists), and reducing bill volatility for large users compared to the current four- and five-tiered rates.[105] TURN envisions a default rate design with a low first tier rate for baseline usage, consistent with existing baseline rates. The second tier might encompass usage from 101-200% of baseline (collapsing the current tiers 2 and 3), with the third tier covering usage above 200% of baseline. The differentials between the first and second tiers and the second and third tiers would be similar, thus resulting in three truly different rates, rather than the present system with two similar lower tier rates, two (or three, in the case of SCE) similar upper tier rates, and a very large differential between tiers 2 and 3.[106]

With baseline quantities set at between 50-60% of average residential usage in each climate zone, this rate design would generally have customers with average usage or less avoiding the third and highest tier rate. It would also continue the existing practice of avoiding wealth transfers from the less wealthy inland regions to the more wealthy coastal regions, in support of universal service throughout the State.

5.4 Evaluating Possible Changes to the Structure of CARE

The California Alternate Rates for Energy (CARE) program provides discounted electricity and gas rates for income-qualified customers, those with household incomes up to 200% of Federal Poverty Guidelines. Approximately one third of Californians are

---

[105] According to a 2008 survey of utility residential rate structures by BC Hydro, which included 88 utilities in North America, Europe, and Asia, 80% of the utilities with default year-round inclining block rates used three tiers or fewer. *See* Appendix C in BC Hydro's 2008 Inclining Block Rate Application, available at www.bchydro.com.

[106] It might also be worth exploring whether winter rates should have fewer or less steep tiers than summer rates.

eligible for the CARE program.[107] As part of the Commission's consideration of optimal rate design for residential customers in the future, the Commission should evaluate whether changes in the structure of the CARE program could increase the affordability of electricity and natural gas for participating customers, at the same or lower cost to ratepayers.

In the current docket addressing the CARE program, A.11-05-017 et al., TURN has urged the Commission to initiate a study to evaluate rate design options beyond those permitted by existing legislative requirements. The Commission has yet to act on TURN's recommendation. In this section, TURN summarizes the legal requirements regarding the structure of CARE rates, as well as TURN's proposal in A.11-05-017 et al.

CARE rates must conform to the statutory requirements of §§ 382 and 739.1. Section 739.1(g) provides, "It is the intent of the Legislature that the Commission ensure CARE program participants are afforded the lowest possible electric and gas rates." Section § 739.1 requires that that the CARE discount be set at a level that ensures that electric and gas rates are not burdensome for low-income electric and gas customers; the level of the CARE discount must reflect the level of need.[108] The Commission must determine the level of need of low-income customers through the Commission's periodic needs assessment required by P.U. Code § 382(d). This assessment of the needs of low-income electricity and gas consumers must "consider whether existing programs adequately address low-income electricity and gas customers' energy expenditures, hardship, language needs, and economic burdens."[109]

---

[107] *Compliance Filing of Southern California Edison Company on Behalf of Itself, Southern California Gas Company, San Diego Gas & Electric Company, and Pacific Gas and Electric Company, Regarding Amended Estimates of CARE Eligible Customers and Related Information*, filed March 20, 2012 in A.11-05-017 et al, Attachment A (showing the following estimates of eligibility rates: SCE, 33.26%; PG&E, 31.50%; SoCalGas, 33.93%; SDG&E, 28.88%; and total across PG&E, SCE, SoCalGas, and SDG&E service territories, 32.93%).

[108] P.U. Code § 739.1(b)(1)("The Commission shall ensure that the level of discount for low-income electric and gas customers correctly reflects the level of need.").

[109] P.U. Code § 382(d).

The requirement of § 739.1 that the CARE discount be set at a level that meets the needs of low-income customers is part of the larger affordability mandate in P.U. Code § 382. P.U. Code § 382(b) provides as follows:

> In order to meet legitimate needs of electric and gas customers who are unable to pay their electric and gas bills and who satisfy eligibility criteria for assistance, recognizing that electricity is a basic necessity, and that all residents of the state should be able to afford essential electricity and gas supplies, the commission shall ensure that low-income ratepayers are not jeopardized or overburdened by monthly energy expenditures. Energy expenditure may be reduced through the establishment of different rates for low-income ratepayers, different levels of rate assistance, and energy efficiency programs.

Accordingly, the CARE discount, coupled with other low-income assistance programs, must be set at a level that makes energy utility bills affordable for low-income ratepayers.

Second, Section 739.1 mandates a minimum CARE discount level by proscribing a CARE rate ceiling. P.U. Code § 739.1(b)(4) provides that "Tier 1, tier 2, and tier 3 CARE rates shall not exceed 80 percent of the corresponding tier 1, tier 2, and tier 3 rates charged to residential customers not participating in the CARE program." Sections 739.1(b)(4) and (5) also require that the CARE rate ceiling be applied to the corresponding rates for non-CARE customers after certain charges have been removed, including;

> any Department of Water Resources bond charge imposed pursuant to Division 27 (commencing with Section 80000) of the Water Code, the CARE surcharge portion of the public goods charge, any charge imposed pursuant to the California Solar Initiative, and any charge imposed to fund any other program that exempts CARE participants from paying the charge.[110]

Because of these exclusions, in practice the CARE rate ceiling for tiers 1, 2 and 3 will be less than 80 percent of the total tier 1, 2 and 3 rates paid by non-CARE residential customers. Accordingly, the rate ceiling mandate of P.U. Code § 739.1 means that the CARE discount must be set at a level that is greater than 20 percent of the rates paid by non-CARE customers.

---

[110] This language appears in both P.U. Code § 739.1(b)(4) and (b)(5).

Additionally, § 739.1 sets limits on the number of tiers in the CARE rate structure and increases to tier 1 and tier 2 CARE rates. P.U. Code § 739.1(b)(5) provides that "Rates charged to CARE program participants shall not have more than three tiers."[111] Likewise, § 739.1(b)(2) authorizes the Commission to:

> increase the rates in effect for CARE program participants for electricity usage up to 130 percent of baseline quantities [tiers 1 and 2] by the annual percentage increase in benefits under the CalWORKs program as authorized by the Legislature for the fiscal year in which the rate increase would take effect, but not to exceed 3 percent per year.[112]

Increases to CARE tier 1 and 2 rates are also limited by the aforementioned rate ceiling of 80 percent of the corresponding non-CARE rate, with the exclusions discussed above.[113]

In A.11-05-017 et al., TURN recommended that the Commission evaluate changes to CARE rate design as part of the second Low Income Needs Assessment, the periodic assessment required by California Public Utilities Code § 382(d). PU Code § 382(d) provides:

> Beginning in 2002, an assessment of the needs of low-income electricity and gas ratepayers shall be conducted periodically by the commission with the assistance of the Low-Income Oversight Board. The assessment shall

---

[111] This section also mandates a method by which an electrical corporation that does not have a tier 3 CARE rate may introduce a tier 3 CARE rate, requiring that the initial tier 3 rate be no more than 150 percent of the CARE baseline (tier 1) rate, with increases up to the rate ceiling (80 percent of the corresponding non-CARE tier 3 rate) phased in over time.

[112] This limit on CARE tier 1 and 2 rate increases ends on January 1, 2019, at which point CARE rate increases are limited only by the affordability mandate and discount minimum provisions of § 739.1. Beginning on January 1, 2019, § 739.1(b)(3) provides: "the Commission may, subject to the limitation in paragraph (4) [a rate ceiling for CARE tier 1, 2, and 3 rates of 80 percent of corresponding non-CARE tier 1, 2 and 3 rates, after excluding certain charges], establish rates for CARE program participants pursuant to this section and Sections 739 and 739.9, subject to both of the following: (A) The requirements of subdivision (b) of Section 382 that the commission ensure that low-income ratepayers are not jeopardized or overburdened by monthly energy expenditures; (B) The requirement that the level of the discount for low-income electricity and gas ratepayers correctly reflects the level of need as determined by the needs assessment conducted pursuant to subdivision (d) of Section 382."

[113] § 739.1(b)(4).

> evaluate low-income program implementation and the effectiveness of weatherization services and energy efficiency measures in low-income households. The assessment shall consider whether existing programs adequately address low-income electricity and gas customers' energy expenditures, hardship, language needs, and economic burdens.

The Commission has only completed one Low Income Needs Assessment, published in 2007.[114] That study took several years to complete, and the underlying data is now more than five years old.[115] The first Low Income Needs Assessment has been relied upon by many parties and the Commission in formulating the policies impacting low income customers.

TURN proposed that the second Needs Assessment should consider, among other issues, whether the needs of low-income customers would be better met if the CARE program were structured differently. Currently, all customers of each utility who are eligible for CARE pay the same discounted rates. This rate structure is called a "straight discount."[116] One alternative to a straight discount program that is offered by utilities in other states is a "tiered discount" program, where the level of discount depends on the customer's income or poverty level.[117] Some utilities provide a third alternative, a "consumption-based discount," where the percentage discount varies depending on the level of usage.[118] A "consumption-based discount" might decrease with increasing usage, for instance. Other utilities offer a "percentage of income payment plan," which sets each low-income household's payment amount based on a pre-determined "affordable" percentage of its monthly income.[119]

---

[114] *Final Report on Phase 2 Low Income Needs Assessment*, Prepared by KEMA, Inc., October 7, 2007, available at http://docs.cpuc.ca.gov/published/Graphics/73106.PDF.

[115] A.11-05-017 et al., Response of TURN to the December 28, 2011, Questions of Administrative Law Judge Kim (Set 1, Category 2), filed Jan. 23, 2012, p. 13.

[116] *See Access to Utility Service, 4th Edition* (2008), National Consumer Law Center, p. 221.

[117] *Id.*, pp. 225-227.

[118] *Id.*, pp. 227-228.

[119] *Id.*, p. 228.

As TURN explained in A.11-05-017 et al., the first Low Income Needs Assessment analyzed the "energy burden" and "energy insecurity" of California's low-income population.[120] "Energy burden" is the portion of total household income that goes toward paying energy utility bills, while "energy insecurity" is a measure of how frequently a household will experience difficulty in keeping up with energy utility bills and be threatened with service disconnection. This analysis could be expanded in the second Needs Assessment to consider how energy burden and insecurity might differ under different rate assistance structures. The Commission could then use this analysis in considering the costs to ratepayers and benefits of these programmatic approaches, compared with the current CARE program structure.

TURN reiterates our request here that the Commission seize this opportunity to obtain data that could inform the Commission's evaluation of whether changes in the structure of the CARE program could *increase the affordability* of electricity and natural gas at the *same or lower cost to ratepayers*. The record in A.11-05-017 et al. reflects that the current CARE program (in conjunction with the Commission's other low-income assistance programs) does not satisfy the statutory mandate of Public Utilities Code § 382(b) and § 739.1 that energy services be affordable for low-income utility customers.[121] The record also reflects the concerns of some parties about the costs of the current CARE program.[122] Accordingly, the Commission should proceed with the second Needs Assessment to determine whether the needs of low-income utility customers could be better met if the structure of CARE were different and how any such programmatic changes would impact the costs of the program.

---

[120] *Final Report on Phase 2 Low Income Needs Assessment*, p. 5-9 (Energy Burden) and p. 5-16 (Energy Insecurity).

[121] *See, i.e.,* A.11-05-017 et al., Response of TURN, The Division of Ratepayer Advocates, the Greenlining Institute, and Center for Accessible Technology to the December 28, 2011, Questions of Administrative Law Judge Kim (Set 1, Category 2, Questions 3, 4, and 7), filed Jan. 23, 2012, pp. 6-8 and Attachment 1.

[122] *See* A.11-05-017 et al., Opening Brief of the California Large Energy Consumers Association (CLECA), p. 3 (arguing that the costs of the CARE discount "are simply getting too high," while also emphasizing that CLECA "does not oppose the CARE program.").

5.5 Solar Distributed Generation

Rate design has a large impact on the value of behind-the-meter generation under net energy metering (NEM) tariffs. The value of on-site solar installations is greatly enhanced by both high upper tier rates (resulting in higher displaced marginal costs) and higher on-peak prices (resulting in higher price for output). However, the end result of such a NEM system is that the value of solar output to the grid depends entirely on the net consumption of the customer, the load profile of the customer, and the generation profile of the customer.

TURN suggests that such an outcome is inequitable because solar customer generators are paid widely different prices for their solar output. For example, consider a very simplified comparison between two customers located in Fresno, PG&E baseline zone R, where the summer baseline amount is approximately 513 kwh per month. Assume they are each on the standard residential rate schedule E-1,[123] and assume each customer produces exactly the same amount of solar generation – 800 kWh per month. The only difference is that one customer (call her L for low user) uses 1000 kwh for the month, while the other customer (call him H for high user) uses 2000 kWh for the month. Due to the difference in tiered rates, customer L saves about $160 on her bill, while customer H saves about $270 on his bill. The result is that customer L got paid about 20 cents/kWh for her solar output, while customers H got paid 34 cents/kWh for his solar output. Is this a fair outcome? And if customer H decides to put in energy efficiency, his solar output could be worth less.

TURN suggests that the most equitable and sustainable solution is to reform the net energy metering tariffs to eliminate the current "bill crediting" mechanism. Instead, the utilities should pay all customer generators a uniform price (time-differentiated) for all solar output, and charge customer generators the full retail bundled price for imports from the grid. This is a more sustainable and equitable method to promote long-term growth distributed generation for on-site use.

---

[123] The analysis would be more complicated for the E-6 TOU rate schedule, but the conclusions would be exactly the same assuming equal use and generation profiles (not quantities, but hourly output as percentage of entire use or output).

5.6 EV Rates

Under current residential tiered rates, a customer with an electric vehicle (EV) will end up charging at expensive rates in the higher tiers if they do not select a special EV rate, assuming there is such a rate available. TURN proposes that EV loads be carved out and charged on a separate tariff via a submeter. The tariff should (1) incorporate a large incentive to stay out of peak periods (for example a punitively-high, on-peak rate);[124] (2) include the rate components that all other rate classes are required to pay, such as the Public Purpose Program Surcharge and other non-bypassable surcharges; (3) include the revenue required for any systemic costs of serving EV customers, such as back-office changes to billing systems, for example; and (4) be fashioned to pay EV customers for any ancillary services they provide to the system, to the extent that utilities and third parties obtain the ability to aggregate EVs loads for participation in California Independent System Operator (CAISO) ancillary service markets. Any tariff that relies on TOU should not include any increased baseline, as EV owners should not need any such rate incentive, given that they already have fuel-rate incentive when switching from more-expensive gasoline costs to less-expensive electric rates for equivalent miles of service

6 Conclusion

For the foregoing reasons, the Commission should evaluate near-term residential rate design choices using the three policy pillars of (1) universal service, (2) conservation, and (3) peak load reduction. Accordingly, the Commission should retain a default residential inverted tier rate design with the existing baseline system and no customer charge because this structure best advances the policy goals of universal service and conservation. The Commission should not adopt a default residential dynamic pricing tariff because such tariffs are inconsistent with the policy goals of universal

---

[124] We include the word punitive here to describe a higher-than-marginal-cost-based rate, given that the convenience of charging on-peak would trump the savings that would otherwise be realized by charging off-peak, especially when considering large difference between electric expenses for EVs and gasoline expenses for non-EVs, generally.

service and conservation and because the policy goal of peak load reduction is best pursued through automated demand response programs. Finally, given a choice only between PDP and PTR for residential customers, TURN recommends the implementation of "reward pricing" (PTR) rather than "penalty pricing" (PDP), because PDP undercuts the policy objectives of universal service and conservation.

Date: March 30, 2012

Respectfully submitted,

By:
_____/s/_____
Hayley Goodson
Staff Attorney

The Utility Reform Network
115 Sansome Street, Suite 900
San Francisco, CA 94104
Phone: (415) 929-8876
Fax: (415) 929-1132
Email: hayley@turn.org