BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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

OPENING COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL (NRDC) ON PARTIES' RESIDENTIAL RATE DESIGN PROPOSALS

July 12, 2013

Sheryl Carter
Natural Resources Defense Council
111 Sutter St., 20th Floor
San Francisco, CA 94104
(415) 875-6100
scarter@nrdc.org

Jim Lazar, Consulting Economist
Microdesign Northwest
1063 Capitol Way S. #202
Olympia, WA 98501
360-786-1822
jim@jimlazar.com

Table of Contents

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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

OPENING COMMENTS OF THE NATURAL RESOURCES DEFENSE COUNCIL (NRDC) ON PARTIES' RESIDENTIAL RATE DESIGN PROPOSALS

I. INTRODUCTION

Pursuant to Rules 1.9 and 1.10 of the California Public Utilities Commission's (Commission) Rules of Practice and Procedure, the Natural Resources Defense Council (NRDC) respectfully submits these Opening Comments on the Residential Rate Design Proposals. NRDC is a non-profit membership organization, representing nearly 100,000 California members with an interest in receiving affordable energy services and reducing the environmental impact of California's energy consumption.

II. EXECUTIVE SUMMARY

NRDC presented a proposal in this proceeding that balances the principles for rate design laid out in the RFP and the Commission's Order Instituting Rulemaking (OIR), is compatible with California's energy policy and programs, and would encourage the cleanest, most energy efficient and affordable electric system possible.

Our rate design proposal was also guided in particular by the following considerations[1]:

1) Customers respond to prices, but not to the extent economic theory suggests: policies, programs and prices must work together to produce positive outcomes.
2) Recovering any significant share of revenue through a fixed charge adversely affects energy efficiency and distributed generation progress.
3) Inclining block rates are demonstrated to save energy.
4) Subjecting small customers to complex rates that they cannot understand and have limited ability to respond to is not productive.
5) Larger customers have more options and can better respond to advanced pricing design.
6) Any transition should be gradual and include a clear and deliberate customer education and assistance effort.

NRDC's rate design proposal includes two very simple rate designs: a three-tiered volumetric rate for small customers (defined as customers with demand of <7kW); and a time of use rate with simplified tiers for larger residential customers (defined as customers with demand of ≥7kW).[2] We proposed a simpler design for smaller customers because they impose less peak demand on the system than larger ones and generally have less potential for demand response than larger demand customers.

Our proposal addresses the problem created by the highest tier differentials and the need for more time differentiated response, while embodying a more simplified and understandable bill with transparent conservation incentives for customers. We preserve choice by ensuring that customers are given information about how their standard rate would compare to the alternative rate with their usage pattern, and allowing each customer to opt out onto the alternative rate design. We believe these changes will mitigate most if not all of the issues with the current rate structure for the residential customer class, and perhaps also with onsite generator customers.

[1] NRDC Proposal at pp 4-6.
[2] NRDC's proposed rate design is described in more detail starting on page 8 of the NRDC Proposal.

However, we submitted our proposal, not as the only way an optimal rate could be designed, but with a focus on important principles and goals, and in the hope of finding common ground with other Parties. In that spirit, we were encouraged to see a great deal of general consensus on some important design principles. The principal areas of consensus or near-consensus include:

1) Fixed charges are largely unnecessary and large fixed charges should not be a part of future rate designs;
2) A tiered rate design will be perceived as fair and will encourage energy efficiency, but a rate design of more than three blocks is unnecessarily complex.
3) Time of use (TOU) rates can easily be integrated with tiered rates and there is conservation value in doing so.
4) Any movement towards a significantly different rate design should be gradually phased in and protect vulnerable customers.

Our proposed rate design would best balance the principles and accomplish the goals set forth in this proceeding. However, we also discuss areas where modifications or alternatives could also produce similar results while retaining the important elements embedded in our design. These areas include 1) the number of tiers, assuming adequate differentials between them; and 2) alternatives for TOU to splitting the residential customer class between large and small customer groups. We look forward to further discussion with Parties in this proceeding in an effort to arrive at an optimal rate design that will encourage the cleanest, most energy efficient and affordable electric system possible.

III. THE VAST MAJORITY OF PARTIES DID NOT SUPPORT A FIXED CHARGE

Most Parties agreed with NRDC's assessment that a fixed charge is unnecessary and would hurt the customer's incentive to conserve and/or invest in distributed generation, with ten Parties rejecting it as a part of their rate design proposal.[3] The utilities and CLECA were the only parties in support of such a charge.

[3] DRA; TURN; CforAT/Greenlining; CFC; SDCAN; NRDC; Sierra Club; EDF, SEIA/Vote Solar; and DECA.

A. Fixed Charges are not Cost-Based and are Inequitable

We discuss in detail in our proposal that the only costs that actually vary with the number of customers served are the costs of billing and collections.[4] We will not repeat those arguments here, but we show that if any fixed charge is warranted, a $3.00 customer charge is adequate to recover these costs from small-use customers who do not really require monthly billing. [5] This is the level now imposed by SCE.

Several parties measured their rate proposals against what they called "cost-based rates" which were incorporated into the bill calculators. We do not concur that these were, in fact, properly computed, and therefore believe they produce inequitable results.

As TURN has aptly noted, there is no consensus on, nor Commission approval of, the classification and allocation methods used in preparing these alleged cost-based rates. An obvious example of this is the treatment of all metering and meter reading expenses as "per-customer" costs. As we have noted, there are many benefits from the installation of smart meters – benefits that bear on peak demand and energy savings – and a significant portion of these costs should be treated as usage-related costs, not customer-related costs.[6]

This also leads to misleading results such as SCE's claim that small-use customers pay less than their cost of service. [7] Since their analysis did not separate out the lower fixed costs associated with serving urban vs. suburban customers, single-family vs. multi-family, or overhead vs. underground customers, it failed to recognized that intra-class subsidies exist where customers of these different types are served on a single tariff. None of the four parties who proposed a fixed charge made any differentiation based on these factors.

Assuming, as NRDC believes, that the majority of small-use customers are also located more densely populated urbanized areas, the number of customers per circuit-mile of distribution facilities are different, and small-use customers have better load factors and load shapes than

[4] NRDC Proposal pp 29-30.
[5] NRDC Proposal p 30.
[6] NRDC Proposal at pp 32-34.
[7] SCE Proposal beginning at p. 48.

large-use customers, they are cheaper to service. By ignoring important cost-causation data, the average cost of service used in the bill calculator overestimates the cost to serve small-use customers and produces inequitable results.

B. Fixed Charges Reduce the Benefits to Customers of Energy Efficiency and Distributed Renewables Investments

Fixed charges distort the price per kWh, which is already below the cost of new renewable energy resources plus new distribution systems (a measure of societal long-run marginal cost with which we are comfortable). Fixed charges raise bills most for those who are doing the best job in avoiding the cost of new energy resources. And fixed charges cause increased consumption.

The adverse impacts of fixed charges are unambiguous. As we demonstrated in our proposal, introduction of a large ($25/month) fixed charge would be expected to result in a significantly lower price per kWh, and that would drive usage up by an estimated 12.4%.[8] This would be a massive step backwards.

In addition, Sierra Club analysis of their own and a few other rate designs proposed in this proceeding, found that adding a $5 monthly customer charge would result in 6-21 percent less investment in distributed renewable generation, with air conditioner upgrade potential (simple five year payback) dropping 7-22 percent.[9] They also found similar negative impacts on air conditioner upgrade potential.

SCE claims that fixed charges will enhance conservation but they made this comparison to their current rate design using the flawed measure of "cost" that has been criticized by TURN and others.[10] They didn't make a comparison to a new rate without fixed charge, so it is difficult to be sure how this shows that fixed charges increase conservation. They also claim that increased usage is economically efficient, based on their indefensible assumption that marginal costs are

[8] NRDC Proposal at p. 43.
[9] Personal communication with Matt Vespa, Sierra Club. July 10, 2013.
[10] SCE Proposal at p 53.

LOWER than average costs (even though rates are trending UP).[11] However, SCE admits that they applied a uniform elasticity measure against a customer's total bill, in direct conflict with evidence we submitted from two sources (Wisconsin's controlled experiment, and Faruqui's 2009 paper) suggesting that the elasticity to upper-block usage was about twice as high as lower-block usage.[12]

With appropriate long-run marginal cost assumptions, consistent with an upward trend in rates over time, and appropriate recognition of differential elasticity rates by usage block, the results shown by SCE would quickly reverse to show a net benefit from tiered rates.

C. Globally, Fixed Charges More Often Either Zero or Small

We illustrate in our proposal that, globally, fixed charges are either zero or very small and where they do have such a charge, a lower charge is often applied to multi-family recognizing that it is more equitable since these customers have a much lower cost to serve.[13]

PG&E asserted that publicly-owned utilities (POUs) in California and many large utilities outside CA include fixed charges on their bill.[14] They further assert that "Lack of monthly fixed fees unfairly allocates fixed costs…" and "one of the fundamental principles of cost accounting and rate design generally, is to recover fixed costs through a fixed charge, and variable costs through a variable charge."

This perspective has no foundation in the business world. As pointed out by Sierra Club in their proposal, oil refineries and hotels have massive fixed costs, and both recover these over the units of their product sold – gallons of petroleum products and room-nights in hotels.[15]

> *In the case of a critical commodity such as electricity, universal access is a right, which should not be compromised by fixed monthly charges.* [Sierra Club, P. 10]

[11] SCE Proposal at p 54.
[12] SCE Proposal at footnote 79.
[13] NRDC Proposal pp 30-31.
[14] PG&E Proposal, pp 17-18.
[15] Sierra Club Proposal pp 10-13.

Indeed, fixed charges are almost non-existent outside of regulated monopoly utilities[16]. While many cellular telephone subscribers have high usage and high bills, in most parts of the world (including California), pay-as-you-go cellular telephones carry only a small minimum usage level of only a few dollars per month.

D. Fixed Charges are Unnecessary

As discussed at length in our proposal, NRDC continues to believe that fixed charges are generally inappropriate and unnecessary.

We strongly object to imposing increased fixed charges on small residential customers. The small users are cheaper to serve, the fixed charge would be a large percentage impact on their bills, and they often reside in rental apartment units over which they have very limited control. If the revenue from fixed charges were deducted from their per-kWh rates, it would cause a large reduction in per-kWh rates, which could stimulate uneconomic consumption. However, even for larger use customers who may net meter to zero, we believe other alternatives are far preferable to increased fixed charges, as we discuss in our proposal.[17]

IV. THE OVERWHELMING MAJORITY OF PROPOSALS GENERALLY SUPPORT RETAINING SOME FORM OF TIERED OR INCLINING BLOCK RATE AND/OR TOU WITH A TIERED STRUCTURE

NRDC agreed with many parties that there are some real issues with the current rate design and tier differentials that make it unsustainable. However, in our proposal we emphasized that the problem is not inherent in the tiered rate concept itself and argued that some form of inclining block/tier or baseline differential remains an important way to encourage conservation and energy efficiency. In fact, of the 14 parties that presented full rate design proposals, nine agreed on its value and included some form of tiered rate in their proposal – either as the default rate or

[16] Costco and Sam's Club do have membership fees that recover about 2% of their total revenue, but these are put in place to discourage "shoppers" as contrasted with "buyers" from clogging up their warehouse stores. Survey research shows that consumers who do not have a use for the large sizes sold at Costco do not choose membership, and are able to buy equivalent products at other stores in the desired unit size.
[17] NRDC Proposal at pp 22-27.

as part of the TOU design.[18] All but one of those parties proposed reducing the design to two or three tiers with smaller differentials than exist today.

A. Properly Designed Tiered Rates Meet the Commission's Rate Design Principles

The NRDC proposal demonstrated how our inclining block/tiered rate proposal:

- aligns incremental prices for incremental usage with incremental costs and is therefore consistent with long-run marginal cost including risk and externalities[19] **(Rate Design Principle #2)**;
- are based on a mix of cost causation principles[20] **(Rate Design Principle #3)**;
- best encourages conservation and energy efficiency since most research on demand response concludes that dynamic pricing structures alone lead to load shifts, but not to overall reductions, and analysis and a controlled study show the effectiveness of tiered rates in encouraging conservation[21] **(Rate Design Principle #4)**;
- that even though small customers would not have a TOU rate like the large customers, their inclining block or tiered rates would encourage reduction in both coincident and non-coincident peak demand because higher levels of usage are primarily associated with air conditioning and other peak-oriented loads[22] **(Rate Design Principle #5)**;
- our simplified inclining block/tier design is easier to understand than the current design, the transition is gradual and we allow customers to opt out of their standard rate[23] (**Rate Design Principle #6**);
- our design continues to support universal service, energy efficiency, conservation and greenhouse gas reductions in a simplified and more cost-based way than the current rate design, and does not create new categories of cross-subsidies[24] (**Rate Design Principle #7**);
- our design creates a clear incentives to invest in energy efficiency and conserve[25] (**Rate Design Principle #8**);

[18] PG&E; SCE; DRA; TURN; CforAT/Greenlining; SDCAN; NRDC; Sierra Club; and SEIA/Vote Solar.
[19] NRDC Proposal, pp. 51-52.
[20] NRDC Proposal, p. 52.
[21] NRDC Proposal, pp. 37-40, 53-55.
[22] NRDC Proposal, pp. 55-57.
[23] NRDC Proposal, pp. 57-58.
[24] NRDC Proposal pp 58-59.
[25] NRDC Proposal p 59.

- tiered rates are economically efficient in that they convey the price signal of "the more you use, the more you pay" which reflects the generally higher cost with increasing incremental consumption[26] (**Rate Design Principle #9**);
- a very gradual transition with effective education and provision of tools will help customers respond to the new price signals[27] (**Rate Design Principle #10**).

V. TIERED RATES ARE AS EFFECTIVE AS TOU RATES IN REDUCING PEAK DEMAND

Tiered rates encourage the reduction of total consumption through energy efficiency and conservation. The EPA guide to rate design, referenced in our proposal at page 36, designates tiered rates as the ONLY rate design classified as having "high" customer incentives for reduced overall energy usage. TOU rates encourage the reduction of on-peak usage, but are not classified as having high potential for total usage reduction.[28]

The overall load reduction will naturally have some impact on peak demand. We believe that the savings will be disproportionately on-peak, but it suffices to assume that they are proportional.

Pragmatically, people may buy a more efficient refrigerator (over time) in response to a tiered rate, but they do not change the refrigerator thermostat setting and let the milk sour in the short run. People will, however, adjust their home thermostat to accept a lesser degree of comfort OR buy a more efficient air conditioner in response to a tiered rate. Therefore, we would expect some long-run baseload elasticity of lights and appliances, but both short-run and long-run elasticity for discretionary loads, which are generally concentrated in the on-peak period.

One disciplined review of studies of the relationship between peak demand savings and energy savings looked at specific residential end uses. That review found that the ratio of on-peak savings to average energy savings ranged from 11.7 for room air conditioners to 0.9 for

[26] NRDC Proposal pp 59-60.
[27] NRDC Proposal pp 60-61.
[28] NRDC Proposal p 36.

residential lighting measures.[29] The results in Table 1 show that the peak savings are almost always greater than the average savings; only lighting is characterized by a below-average on-peak load shape. This is intuitive as well, since most end-uses are concentrated during the waking hours when peak loads occur, and lighting is more essential when it is dark.

Table 1. Ratio of Peak to Average Energy Savings For Residential Measures

Measure		Summer Peak kW	Annual kWh	Ratio of Peak to Average Savings
Room AC		0.063	47	11.7
Centra AC		0.0742	378	1.7
Fridge		0.009	61	1.3
Freezer		0.005	39	1.1
Clothes Washer		0.051	463	1.0
CFL		0.006	58	0.9
CFL Torchiere		0.025	231	0.9
Furnace Fan		0.147	396	3.3

As we demonstrated in our proposal, a simple two-tier rate design, with a 1.5 : 1.0 block ratio, can be expected to achieve long-run savings of about 11% of total consumption.[30] While we expect these savings to be more than proportionately on-peak, let us assume that the savings are spread equally across the customer's load profile, reducing load 11% in every hour. An 11% reduction in peak demand, and an 11% reduction in off-peak demand.

We can compare that to the response in peak demand expected from TOU rates. One excellent source on this is the Regulatory Assistance Project publication, "Time-Varying and Dynamic Rate Design".[31] Figure 1 below shows the estimated response to TOU rates, with the vertical axis showing the percent reduction in peak demand, and the horizontal axis showing the ratio of the on-peak price to the off-peak price. At a ratio of 3:1, which is approximately what has been

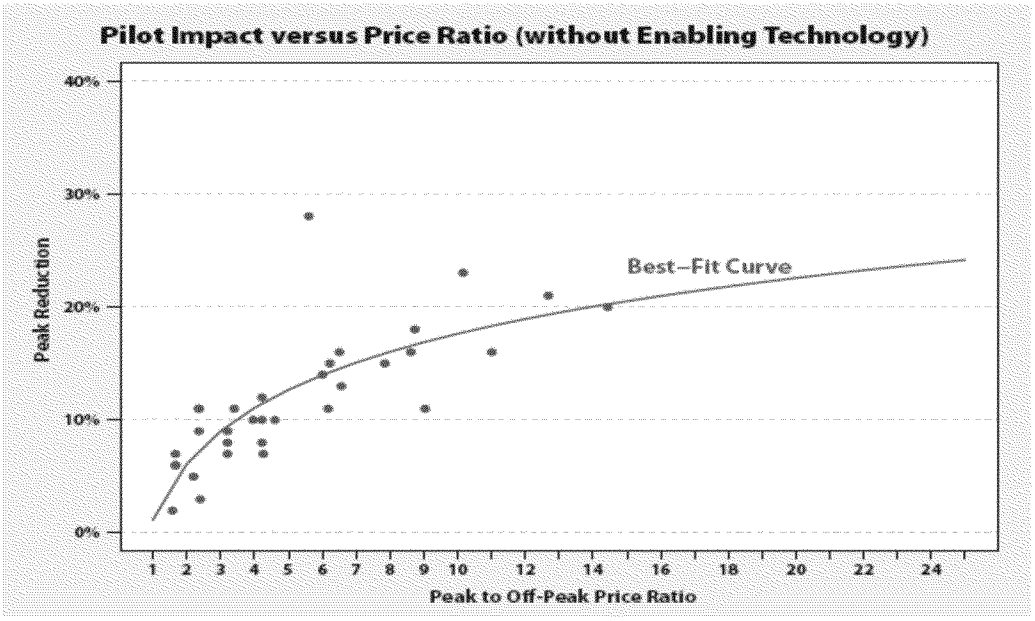
[29] York, et. al. "Examining the Peak Demand Impacts of Energy Efficiency: A Review of Program Experience and Industry Practices." 2007. http://www.epa.gov/statelocalclimate/documents/pdf/york_paper_ee_peak_demand_4-12-2007.pdf

[30] NRDC Proposal p 42.

[31] Faruqui, et. al. "Time-Varying and Dynamic Rate Design." 2011. www.raponline.org/document/download/id/5131

advocated in the proposed TOU designs in this proceeding, peak demand reduction of about 7 – 11% is predicted – no better than the peak load reduction from a tiered rate, but without the environmental benefits associated with off-peak load savings.

Figure 1



These two estimates are highly compatible. The calculation we prepared in our proposal and discussed above, used an elasticity estimate taken from Dr. Faruqui's 2009 Public Utilities Fortnightly article, Inclining Toward Efficiency. The RAP publication from which the TOU peak load savings was taken was also authored by Dr. Faruqui, only two years later. Same author. Same concept. Same result.

Excel Energy implemented a two-block tiered summer rate in Colorado in 2009. When they proposed the rate, they assumed that customers would reduce their usage by 0.26% for each 1% increase in the marginal (end-block) price, and increase usage by 0.13% for each 1% decrease in the marginal price in other months. Their program evaluation for 2012 showed a 3.99% reduction in total energy consumption, coupled with a 2.9% reduction in class coincident peak demand resulting from this rate design change.[32]

[32] Xcel Energy. "Impact Analysis of Residential Two-Tier Inverted Block Rates (IBR)" January 22, 2013.

The conclusion is that the tiered rate option will (and has) also provided peak load savings, and will continue to do so. Whether they are proportionate or more-than-proportionate is an analytical task we have not undertaken, so we have assumed only proportionate savings. We believe that the peak load savings from tiered rates alone are equal to the peak load savings from TOU rates alone. When coupled with a TOU rate, as NRDC has proposed for customers with larger loads who have more ability to respond to TOU pricing, we believe the results will be impressive and far more effective than TOU rates alone. Simplification, appropriate differentials (see discussion below), and effective education and access to tools could make this hybrid design understandable and accepted by customers.

VI. TIERED RATE BLOCK RATIOS OR DIFFERENTIALS

NRDC proposed an end-state block ratio for tiered rates of 1.0 : 1.5 : 2.0, meaning that the second block would be 50% higher than the first, and the third block would be 100% higher than the first. While much narrower than the current block ratios created by the 4-tier rate and the effect of state legislation, it is steep enough to be effective, and well within the range of other inclining block rate designs in the West.

By contrast, utilities sought block ratios as low as 1.15 : 1.[33] This ratio would forego the majority of the benefit achieved by tiered rates: improving the economics of energy efficiency investments for customers, and driving them to participate in utility-offered energy efficiency programs.

Table 2 below presents the block ratios for several large utilities along the West Coast. The utility proposals in this proceeding would be at the extreme "flat" end of the spectrum among their peers in the West.

[33] PG&E Proposal at p. 29. SCE proposed a 1.2 : 1 ratio at p. 13 of their proposal.

Table 2. Block Ratios of Western Utilities

State	Utility	Blocks	End to 1st Block Ratio
Washington	PSE	2	1.22
	Avista	3	1.36
	Pacific	2	1.56
Oregon	PGE	2	1.07
	Pacific	2	1.20
Arizona	APS	4	1.78
	Tucson	4	1.35
Mexico	CFE	4	3.99

VII. THE MAJORITY OF PARTIES SUPPORTED SOME FORM OF TIME OF USE STRUCTURE, BUT MANY PREFERRED IT TO BE OPT IN

All but one Party included some form of TOU rate design as part of their proposal.[34] Seven Parties proposed that TOU be the default rate either from the start or after a period of transition. Six Parties preferred the voluntary or opt in route.

NRDC supports TOU rates and believes they are a valuable tool to shift load to off peak, help integrate renewables, provide proper price signals to EV and PV customers, and more, but they do not necessarily carry the same value for all customers. We have proposed a hybrid of both options: with an opt-in rate for small users, and an opt-out rate for large users. We continue to believe this is the best option for California; however, we offer an alternative below if the Commissions decides not to accept our proposal.

As explained at the June 25 Workshop, our proposed "dividing line" of 7 kW of consumption largely translates into a division between single-family customers being placed on the TOU rate, and multi-family customers being placed on the non-TOU rate, but very frugal small-use single-

[34] Although CforAT/Greenlining did indicate that IF imposed by the Commission, there would have to be an opt-out for vulnerable customers, p. 44.

family, and larger, air-conditioned apartments, would be classified appropriately. We remain receptive to whether this 7 kW non-coincident peak demand criteria is the best definition between the two subclasses of residential usage. We believe it would place virtually all photovoltaic, electric vehicle, and air conditioning customers on the TOU rate, and these are the customers with the most ability to shape their net demand on the utility in response to a TOU rate.

Our proposal is grounded in an understanding of the end-uses that are most susceptible to scheduling. NRDC and our consultant draw on our combined global experience, and our study of this issue worldwide, not just in California.

France[35] and Germany[36] introduced utility direct control of water heating a generation ago, when large nuclear units were installed, in an effort to "*shape load to match generation.*". Large nuclear units operate best in a baseload mode. Both countries have millions of electric water heaters and electric space heaters under utility control. France offers well-designed TOU rates to reward participating customers, and most single-family customers in France have opted into the "heures" or "tempo" programs. But apartment flats without electric water heating most often do not choose the TOU rate, because the potential benefits are smaller than the perceived costs.

California, by contrast, developed the Helms, Castaic, and Pyramid pumped-storage hydro units as a way to "*shape generation to match loads*." While we do not take issue with the value of pumped storage hydro, and believe that the grid must be operated more flexibly, we also believe that all effective tools should be used to balance the system. It is instructive that the countries that went the other way focused on large loads first – water heating and space conditioning – to achieve their goals. In those countries, TOU rates were then offered to the participating load control customers as options, and the combination was attractive to millions of customers. This is a good example of a program and pricing policy working effectively together to achieve a goal. Both pathways should have a role in California.

---

[35] International Experience With Water Heating. ACEEE, 2012. http://www.aceee.org/conferences/2012/hwf/program

[36] Personal conversation with Andreas Jahn, Regulatory Assistance Project (Berlin), June 18, 2013 ajahn@raponline.org

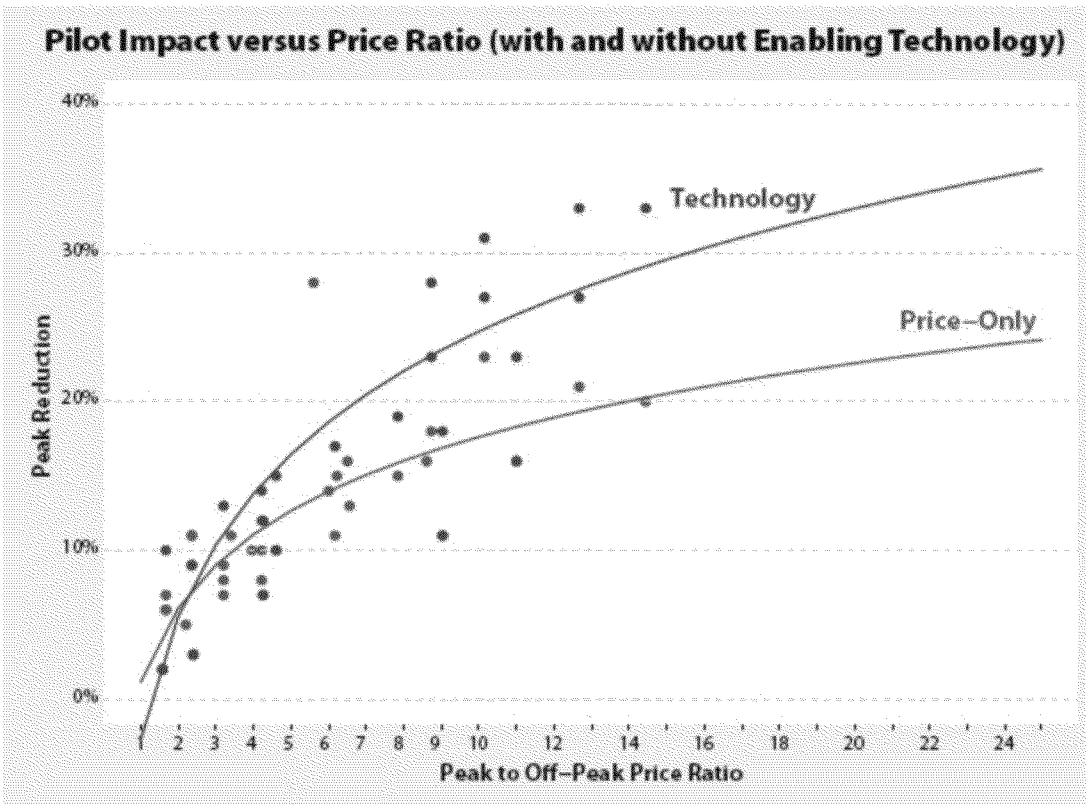
Residential apartment loads are dominated by lighting, refrigeration, appliances, and electronics. None of these are particularly susceptible to schedule, except perhaps for computer usage, and there the potential is inverse to the desired outcome. With a tiered rate, a computer user is encouraged to power their computer down overnight when it is not being used. With a TOU rate, there is less benefit to doing so, and we would expect customers would be less likely to do so.

Conversely, larger residential customers are those with electric water heating, space conditioning, swimming pools and spas, electric vehicles, and other large loads. All of these are more adaptable to scheduling than lights, appliances, and electronics. This is the reason that NRDC proposed applying a TOU rate as the standard rate design for large-use residential customers.

Indeed, the studies of dynamic pricing have showed that technology enhancement to control large loads produces a much better result that dynamic pricing alone. Figure 2 below, prepared by Brattle for RAP, shows this effect[37]:

[37] Faruqui, et. al. "Time-Varying and Dynamic Rate Design." 2011. www.raponline.org/document/download/id/5131

Figure 2



The NRDC proposal introducing standard TOU service to large users is a first step to achieving this type of result. The second part of this step, which we believe should be combined into any decision to make a TOU rate the standard rate for any customers, is to require utilities to enable customers to respond to these prices through technology enhancements. At a minimum, providing for installation of controls for water and space conditioning, swimming pools and spas, and electric vehicles should be a part of any default TOU rate schedule; indeed, we recommend that technology enhancement be made a part of existing opt-in TOU rate schedules as soon as possible.

If the Commission does not adopt our proposed large/small customer split, a workable alternative could be an opt-in TOU (with baseline or tiers), which targeted the larger users and provided all customers with significant education and tools necessary to help them respond to the price signals.

VIII. RESPONSES TO SELECT ISSUES RAISED IN PARTIES' PROPOSALS AND THE JUNE 25 WORKSHOP

A. Customers will respond to the Rate Design, not just the Size of the Bill, but the Rate Design Must be Easily Understood and Laid Out Simply on the Bill

NRDC discusses how proper education and bill simplification will make our rate design understandable and transparent to customers.[38] It is important that customers understand the effect their actions to increase or decrease usage will have on their bill, and this requires all pricing elements be consolidated for presentation on the bill.

PG&E has asserted that over half of its customers don't even know they are on a tiered rate and don't understand how the structure drives their bills, and further claim that "*customers believe they could conserve better with a TOU rate than a 4-tier rate*." Is this a result of inadequate education or bill simplification, or is this something else?

While we agree that many customers pay little attention to their electric rate design, what PG&E failed to do was to link customer awareness to bill size. Apartment dwellers with very small electric bills – less than $50 per month – are certainly less likely to pay attention to their bills, their rate design, or their conservation potential than large single-family users with higher bills in the hundreds of dollars.

Pragmatically – a customer with usage only in the baseline block does not see a "tiered rate" on their bill, because the bill shows only the level of usage in the first block. Many customer bills do not exceed baseline quantities.[39] It is not surprising that something like half of users are not aware of the tiered rate design – about one third of them DO NOT EXPERIENCE a tiered rate design in any given month, since their usage is confined to the first block. It is important to note, however, that these customers collectively account for less than 10% of class usage.

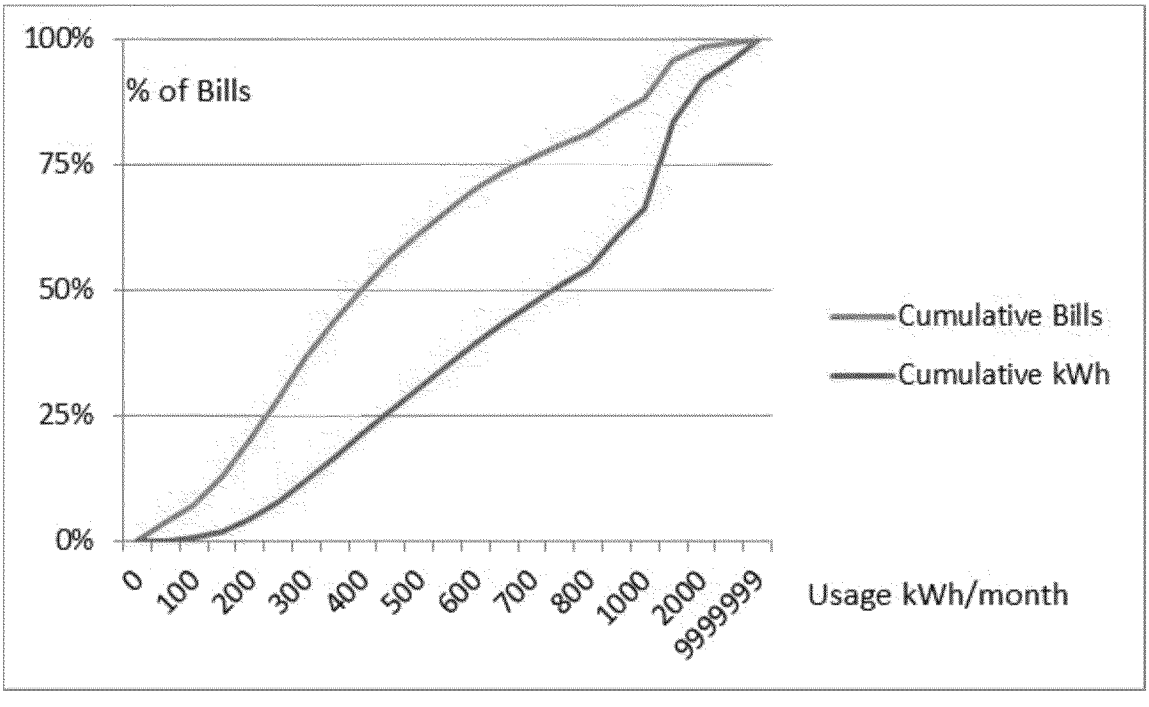
---

[38] NRDC Proposal pp 14-17.

[39] PG&E response to TURN Data Request #9, Application 10-03-014 and SCE response to TURN Data Request 03, 2012 GRC Phase 2 both show that many customers – as many as 43% in one climate zones -- NEVER exceed the second block of usage during the year.

What is far more important is that half of the customers DO know. And if that is the half with high usage, then we indeed have achieved a goal of communicating a fairly complex concept – rate design – to the customers who have the most ability to respond to it. Figure 3 below compares the percentage of bills at each level of usage for an inland Southern California utility with the percentage of total usage at each level. This shows that the 50% of the customers with the highest usage consume about 80% of the kWh. NRDC believes that we should concentrate efforts on these large users. Small users should be eligible to participate in all energy efficiency programs as they are today, should be exposed to a tiered rate design, and should be able to opt IN to a TOU rate design, but we should not expect them to have large thermal heating or cooling loads that can and will respond to complex pricing.

Figure 3
Bill Frequency and Usage for a Southern California Electric Utility



B. Both Energy Efficiency and Load Shifting are Valuable, but they are very Different in Nature

As explained in our proposal, a rate component like TOU that promotes or encourages load shifting is valuable because it can facilitate the integration of intermittent renewable resources, reduce or delay investment in new peaking capacity, increase reliability and reduce peak system costs. BUT, that rate design does not necessarily encourage conservation and investment in energy efficiency, which has value because it reduces our overall load long-term and therefore avoids need for high-cost marginal resources of all types (baseload and peaking) to be added to the system.

When it says that some of its customers believe they could "conserve better" with a TOU rate, it is unclear whether PG&E is actually referring to energy efficiency (using fewer kWh to achieve the same ends) or load shifting (using less energy during high-cost periods and more energy during low-cost periods). Several other parties also appeared to conflate the two. NRDC has addressed both of these in our proposal. First, we propose that all customers face a tiered rate to encourage energy efficiency; second, we propose that all large-use customers ALSO face a TOU rate to encourage load shifting.

C. Overall Load Reduction and Peak Load Shifting also have Different Environmental Impacts

While energy efficiency (reducing the total amount of energy required to meet the same needs) unambiguously provides environmental benefits, load shifting (reducing load on-peak and increasing load off-peak) is less certain to do so – at least in terms of air emissions. First, air emission reductions from energy efficiency, especially regarding carbon pollution, are much larger because the reductions occur over more hours and longer-term than peak load shifting.

Second, with the western region's current resource mix, it is not guaranteed that the marginal resource off peak will be clean. California is interconnected to utilities throughout the Western United States, and California utilities buy and sell power extensively in the interstate system.

During off-peak periods, the marginal resource in the West is often a coal-fired power plant. When this occurs, the environmental costs (i.e., the "Societal Marginal Cost" to which Dr. Borenstein referred) are very high.

While we agree with DRA that a "simple" way of looking at load shifting is a shift from simple-cycle gas generation on-peak to combined-cycle gas generation off-peak, with about a 30% fuel savings[40], we know from studies of the West that this is not always the case. The Northwest Power and Conservation Council studied this exact issue using their model of the entire Western grid, and that analysis showed that coal is often the marginal fuel during off-peak periods.[41]

In the next few years, we expect to see a further decline in the regions's coal generation, and expect that it will be wind, not coal on the margin in the off peak periods. This will change the calculus considerably. In the meantime, load shifting through TOU has substantial benefits in the integration of renewable resources, which unambiguously provides environmental benefits.

D. TURN's and CFORAT/Greenlining's Care Proposals are Interesting and would Encourage Conservation

TURN and CforAT/Greenlining have proposed that the CARE discount be a declining percentage of the bill as usage increases.[42] This would have the effect of mitigating the bills of frugal CARE users, and exposing most CARE-eligible customers to an effective rate very close to those paid by other users. NRDC generally supports this concept, but we are mindful of the significant initial impact of doing so on large use CARE customers that have large households and therefore higher usage. We propose two mutually compatible options to address this concern.

1) Each affected CARE household should be excused from a portion of the increased cost from the TURN proposal until after they have experienced a thorough energy audit and retrofit of cost-effective measures. Some time limit would need to be placed on this, so

[40] June 25 Workshop presentation by Bob Levine, DRA.
[41] Northwest Power and Conservation Council. "Preliminary Report: Price and Dispatch Effects of Load Shifting." 2000. http://rtf.nwcouncil.org/presentations/LoadShiftStudy2000_0314.htm
[42] TURN Proposal at p. 6. CforAT and Greenlining also supported such a concept at p. 62 of their proposal.

that households cannot "escape" the rate design change by refusing an audit. We propose a three-year time limit be imposed on the utilities to complete these audits and retrofits.[43]

2) Consideration of a per-capita CARE baseline increment where household size is demonstrated to be greater than four individuals. We are mindful of the administrative cost of this concept, but think it is appropriate as a "circuit-breaker" for large, often multi-generational households dealing with California's high real estate costs as best they can.

IX. OBSERVATIONS ON DR. BORENSTEIN'S REMARKS

A Commission Workshop was held on June 25th to allow the Parties to present and discuss their proposals. Dr. Severin Borenstein was invited by the Commission to present at the Workshop. While he admitted he had not read all of the proposals, he did contribute two general ideas that we believe should be cornerstones of the Commission's ultimate decision in this rulemaking:

1) **Rate design should reflect full societal long-run marginal cost.** There are two key elements of this recommendation. The first is "societal" and the second is "long-run." These are different from the measure of marginal costs that has historically been used for inter-class cost allocation in California, particularly with respect to the inclusion of societal costs not reflected in the utility revenue requirement.

   Because electricity rates have been rising, and are expected to continue doing so, it is axiomatic that utility system marginal costs exceed average costs (for otherwise rates would be declining as lower cost additions were made to the existing system). When societal costs are included, it is self-evident that long-run societal marginal costs are

[43] This is not an overly-aggressive schedule for a utility system with 30 years of history doing energy efficiency audits and retrofits. New Zealand undertook to weatherize and improve the heating system efficiency for 100% of low-income households as a part of their 2008 economic stimulus program. The program was completed on-schedule. Among the evaluation findings: a 43% reduction in hospital admissions due to respiratory illness, and a 39% reduction in days lost at work. See: Barnard, et al., The Impact Of Retrofitted Insulation And New Heaters On Health Services Utilisation And Costs, Pharmaceutical Costs And Mortality: Evaluation of Warm Up New Zealand: Heat Smart. 2011, http://www.healthyhousing.org.nz/research/current-research/evaluation-of-warm-up-new-zealand-heat-smart/

much higher than average costs. These societal costs include the damage costs of unmitigated environmental impact, visual pollution from electric power facilities, and such things as land use value impacts to properties adjacent to power facilities.

One useful measure of long-run societal marginal costs would be to measure the cost of building an all-underground transmission and distribution system connected to 100% renewable energy production facilities; we think it is evident that these costs would be significantly above the average costs of California utilities today. This is confirmed by the Crossborder Energy study cited by SEIA/Vote Solar at page 22 of their proposal, even without considering non-energy costs of supply options.[44]

2) **If one must deviate from long-run marginal cost in rate design, it is best to do so by "discounting" the customer charge and the rate for a small initial (baseline) block of service.** We consider this to be Dr. Borenstein's key contribution to the issues in this proceeding, and our proposal reflects this approach by minimizing any fixed charges, and retaining a baseline block at a price significantly below other blocks of usage.

X. BILL IMPACT CALCULATOR AND OUR MODELING RESULTS

NRDC did not use the utility bill calculators for several reasons. First, we disagree with some of the underlying assumptions, particularly with respect to marginal customer and energy costs. Second, our rate design could not be accommodated in the bill impact calculator as designed – a three-block tiered rate with a TOU element for larger residential users. Third, the calculators were complex, and we didn't have sufficient resources or time to modify them to sufficiently model our proposal. We might have undertaken that if we thought the results would be more meaningful, but as indicated, there were more fundamental flaws, many of which were also noted by other parties in their proposals.

[44] Beach, R. Thomas, and McGuire, Patrick G., "Evaluating the Benefits and Costs of Net Energy Metering in California" (January 2013). pp. B 1.3. http://votesolar.org/wp-content/uploads/2013/01/Crossborder-Energy-CA-Net-Metering-Cost-Benefit-Jan-2013-final.pdf

NRDC instead modeled its rates based on the publicly available bill frequency data for a Southern California electric utility, using a uniform 250 kWh baseline allowance. This provided our approximate illustrative rate.

Fortunately, the rates for each utility modeled by DRA happened to exactly match the block ratios that NRDC proposed for the small-customer standard rate design: 1.0 : 1.5 : 2.0. We therefore believe that the rates presented by DRA at page 17 of their proposal generally reflect the proposal for a tiered rate (the standard rate for small-use customers) that NRDC has proposed. The difference is that NRDC has proposed a seven-year phase-in period to a three-block rate, while DRA has modeled an instantaneous transition. For illustrative purposes, however, the DRA calculation of their "opt-out" rate is a good proxy for our proposal, so the Commission can see the effect of this approach.

XI. STAFF PROPOSAL

At the end of the June 25th workshop, the staff indicated that they may be submitting their own proposal in this proceeding.

NRDC does not object to this, provided that adequate time is provided for all parties to query the staff about their assumptions and calculations, and to provide written comment on the Staff proposal. We request that the Administrative Law Judge set a schedule for this review, within the context of this overall process.

Dated: July 12, 2013

Respectfully submitted,

Sheryl Carter
Co-Director, Energy Program, NRDC

Jim Lazar
Consulting Economist, Microdesign Northwest