BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking to Assess Peak Electricity Usage Patterns and Consider Appropriate Time Periods for Future Time-of-Use Rates and Energy Resource Contract Payments.	Rulemaking 15-12-012 (Filed December 17, 2015)

COMMENTS OF THE SOLAR ENERGY INDUSTRIES ASSOCIATION ON TIME DIFFERENTIATED RATES CONSIDERATIONS

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In accordance with the March 17, 2016 ruling of the assigned Administrative Law Judge, the Solar Energy Industries Association (SEIA)[1] submits the following comments on types of time-differentiated rates that should be considered for possible inclusion in the framework guidance document in this Rulemaking.

I. INTRODUCTION

In its comments on proceeding scope, SEIA recommended that this proceeding be used as the vehicle to develop time-of-use (TOU) rate design guidelines.[2] We therefore appreciate the opportunity to present the Commission with TOU rate options for the Commission to consider, and discuss below several ideas for different TOU rate structures that the Commission should consider. These additional TOU rate concepts are intended to address the challenge of successfully moving customers to rates that more accurately and directly address the fundamental changes in system conditions and costs that are occurring on the California grid today. In the comments below, we have outlined principles related to the responsiveness of TOU

[1] The comments contained in this filing represent the position of the SEIA as an organization, but not necessarily the views of any particular member with respect to any issue.

[2] *See* Comments of the Solar Energy Industries Association on Preliminary Scope and Schedule, R. 15-12-012 (January 15, 2016), p. 11

rates to both bulk system and distribution system needs as well as the elements of several distinct rate designs that could be combined to form numerous variants. Table 1 provides a summary of these rate design concepts.

Table 1: *Summary of Proposed Rate Designs*

Rate Design Concept	Applicable Rate Classes	Rate Design Description	Incorporation of Distribution System Costs into Rates
TOU-lite	All rate classes	These rates would have moderate differentials in rates between on- and off-peak periods. These TOU-lite rates are already an option for commercial customers.	Both system generation and distribution marginal costs included in determination of TOU time periods for underlying rates
Critical Peak Pricing (optional)	All rate classes	These rates have a high, volumetric rate during a limited number of CPP event days, with customers notified the day-ahead that the following day will be an event day. Critical peak pricing can target either generation or distribution costs (or both), but should have well-defined frequency and duration limitations. Generation CPP is typically targeted to a four-hour block (2p to 6p) to cover the likely system peak. Distribution CPP may target a wider set of hours and be circuit-specific. The customer's underlying rate would be: (1) a flat rate or (2) a simple two-period on-peak/off-peak TOU structure with relatively mild rate differentials	
Discount Days (optional)	All rate classes	The inverse of Critical Peak Pricing, the utility would charge discounted rates during defined hours on event days called a day ahead to coincide with expected renewable energy overgeneration events. The customer's underlying rate would be: (1) a flat rate or (2) a simple two-period on-peak/off-peak TOU structure with relatively mild rate differentials	
More complex rate designs (optional)	May vary	The Commission could consider combinations of Critical Peak Pricing rates, Discount Days rates, and TOU rates. In order for significant numbers of customers to act on these rates, improved signals from the utilities to customers and greater deployment of advanced technology will be needed.	Distribution costs potentially captured through a local distribution-system-peak (e.g., circuit peak) rate for a defined set of hours on a limited number of peak-event days. This could be accompanied by an underlying rate with TOU periods that incorporate distribution marginal costs.

II. TOU RATE CONSIDERATIONS

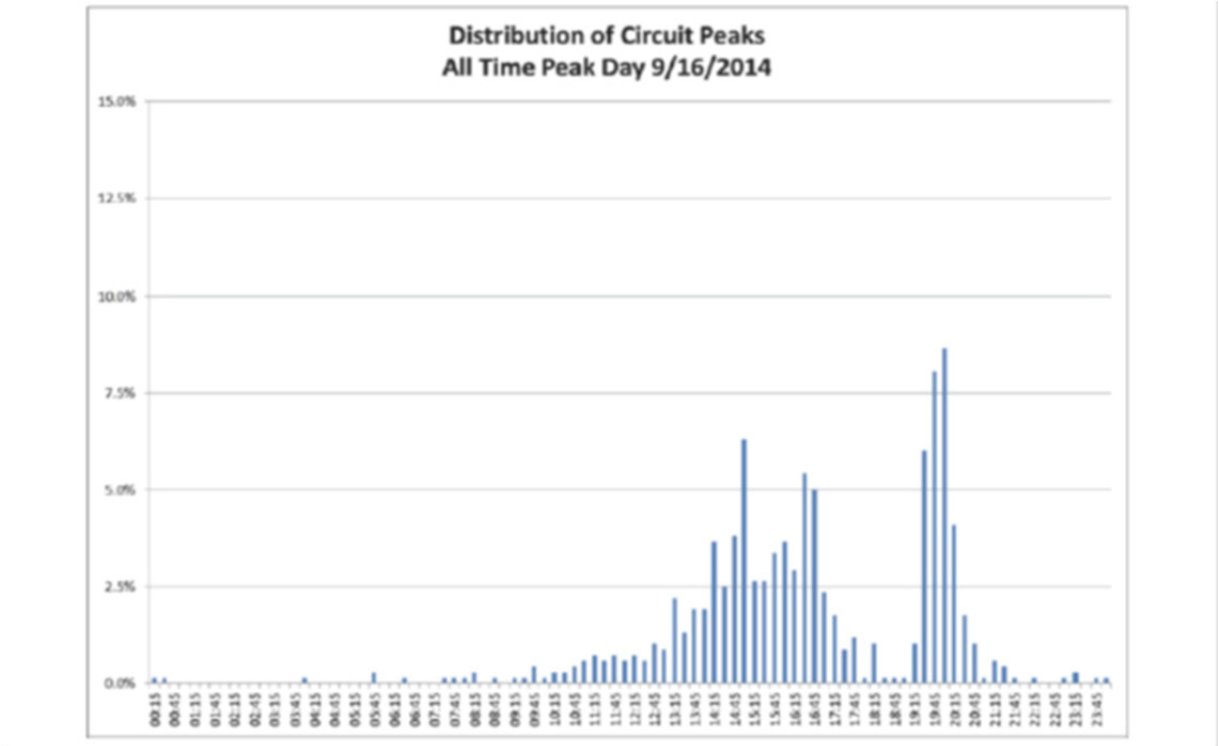
1. TOU Rates Should be Responsive to More than System Generation Costs.

In the past, the Commission has set TOU rates based principally on marginal generation costs. Differences in TOU energy rates reflected the differences in marginal generation costs between TOU periods, with marginal generation capacity costs added principally to on-peak rates and to a lesser extent to mid-peak rates. Similarly, TOU periods have been based on system-level demand, with the on-peak period encompassing the hours of highest demand (and thus the highest marginal generation costs). However, the changing set of resources in California has introduced new operating concerns and constraints that have prompted this proceeding and should be reflected in the choices for both TOU periods and TOU rates.

First, TOU periods should focus on not just the net load peak, but also on the challenging up-ramp period that precedes it. To date the need to integrate increasing levels of renewable generation has focused attention on the "net load" curve of gross demand less variable wind and solar resources, which is the load to which flexible resources, including marginal fossil generation, must be dispatched. This is the basis for CAISO's infamous "duck curve." The challenge in serving the net load curve, however, is not just meeting the net load peak (which is lower than the gross load peak), but also having adequate flexible resources to serve the steeper, shorter ramps in the net load curve, particularly the up-ramp period during the late afternoon and early evening. The CAISO's presentation at the February 26, 2016 workshop confirmed that operating the system during the period of the net load up-ramp is a critical issue for system operations. The seminal paper by Jim Lazar of the Regulatory Assistance Project (RAP),

Teaching the "Duck" to Fly, includes, among the strategies to streamline the duck curve, the use of time-differentiated rates focused on the up-ramp period of system stress.[3]

In addition, TOU rates should incorporate accurate price signals concerning cost causation for delivery. Utility rates include delivery as well as generation costs, and, for smaller customers, delivery costs can exceed generation costs. Loads on the distribution system, which drive distribution infrastructure investments, can occur at significantly different times than the system peak, depending on the local climate and the mix of customers served from the distribution system. SEIA presents again below the SDG&E graphic which shows the time of its distribution circuit peaks on a system peak load day.



[3] Jim Lazar, Regulatory Assistance Project, *Teaching the "Duck" to Fly* (January 2014), at pp. 14-15. Available at www.raponline.org/document/download/id/6977 . A second version (February 2016) of thisstudy has also been released and is available at http://www.raponline.org/document/download/id/7956

Customers have a significant ability today to impact distribution system loads, through multiple types of distributed energy resources. To the extent that peak distribution system loads can be reduced, cost savings can be achieved through less investment in new infrastructure, as the Commission is now exploring in the utilities' distribution resource plans. Historical data on the timing of distribution peaks and costs of upgrades at the circuit level will allow parties to identify the time periods when these system costs can be reduced most effectively and the marginal distribution costs can be avoided.

SEIA also has been concerned for a number of years that the rate design for FERC-regulated transmission costs does not convey accurate price signals to customers. Transmission costs are driven by peak system loads, yet transmission costs generally are recovered through flat, non-time-differentiated volumetric rates or through non-coincident demand charges based on a customer's maximum 15-minute usage, even if that usage is not coincident with system peak loads. SEIA would support the treatment of transmission costs in a time-differentiated manner within optional TOU rates aimed at a steeper differential, or within CPP rates. This could potentially increase the effectiveness of these rates at reducing a significant cost driver of transmission capacity expansion (i.e. coincident peak load)[4].

Obviously, this Commission does not regulate transmission rates, but it does participate in FERC ratesetting proceedings on behalf of IOU consumers generally. SEIA urges the Commission to take positions in these FERC proceedings that are aligned with its own retail rate design policies supporting the greater use of time-sensitive rates in California.

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[4] SEIA notes that in the CAISO's recent 2015/2016 Transmission Plan, approximately $192 million worth of previously approved transmission upgrades were canceled based on lower load due to energy efficiency and distributed solar, thus validating the potential for distributed resources to avoid significant transmission costs. https://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf

2. TOU-Lite Residential Rates.

The introduction of TOU rates represents a major change for residential customers. In this transition, SEIA believes that for default rates, simplicity and understandability are of paramount importance, at least initially, if customers are to accept the new rate designs. The Commission has significant experience with the lengthy transition of all commercial customers to TOU rates, which is nearing completion after many years. As part of this process, the Commission has authorized and recognized the value of "TOU-Lite" rates that are revenue neutral with other tariffs for the same customer class but that have differentials between on-peak and off-peak rates set below the actual difference in the cost of energy by time period.

As the Commission has recognized, TOU Lite rates can serve as "an introductory rate" that provides a transition for customers to learn and understand the new rate structure while avoiding significant rate shock.[5] SEIA observes that existing residential TOU customers (many of whom have installed solar systems) also face a transition as a result of actual and anticipated changes to both TOU periods and TOU rate structures (such as the reduction or elimination of usage tiers in existing TOU rates). More moderate TOU rates also can help to ease the transition for existing TOU customers to new TOU periods and rate structures. Finally, easing the transition to TOU rates will be particularly important for customers who install solar under the Commission's newly-adopted NEM 2.0 framework, because TOU rates are mandatory for such customers.[6] SEIA recommends that the Commission should consider TOU Lite residential rates as a central means to smooth the transition to and increase customer acceptance of TOU rates.

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5 *See* D. 15-07-001, at p. 135-136.

6 *See* D. 16-01-044, at pp. 91-94.

3. Targeted TOU: Critical Peak Pricing and Discount Day Rates.

TOU rates traditionally have been structured with pre-set on- and off-peak periods that are the same every day, perhaps differentiated only by weekdays versus weekends. However, given today's means of mass communications with customers, it is feasible to offer time-varying pricing that is more limited in time and more directly targeted to those days when system needs are the most acute.

For example, to elicit a demand response from customers on specific days when very high demands are anticipated, the Commission has approved Critical Peak Pricing (CPP) in commercial rates.[7] The CPP structure charges a very high, volumetric rate during a four-hour block (2:00 p.m. to 6:00 p.m.) on a limited number of CPP event days each summer, with customers notified the previous day that the following day will be an event day. CPP customers receive a lower on-peak rate on non-event days, such that the CPP rate is revenue neutral assuming no change in customer behavior. Thus, CPP rates are TOU rates targeted at the limited number of hours when load reductions will be the most valuable for reducing system costs.

Currently CPP targets generation costs, but going forward CPP could target either generation or distribution costs (or both). In either case, these rates should have well-defined frequency and duration limitations. As noted above, Generation CPP is typically targeted to a four-hour block to cover the likely system peak. Distribution CPP may target a wider set of hours and be circuit-specific.

Some residential customers have the option today to participate in a similar CPP-type program, such as PG&E's SmartRate program, although solar customers are not allowed to elect these rates. SEIA observes that, on the margin, net-metered solar customers see exactly the same

[7] PG&E calls its CPP rates Peak Day Pricing (PDP) rates.

price signals as regular customers, and have the same ability as other customers to shift their loads in response to system conditions. SEIA believes that there is no reason why solar customers should not be eligible for optional CPP rates on the same basis as other customers. Indeed, the Commission has found that, if CPP rates are the default rate, then as a matter of law solar customers must be allowed to elect such rates.[8]

With California expected to continue to increase its penetration of renewable generation in pursuit of the 50% by 2030 RPS goal, a new focus of concern is the potential for excess renewable generation at certain times of the year, particularly in the spring months when electric demand is moderate but renewable hydro, wind, and solar resources may be abundant.[9] The Commission should consider addressing this phenomenon with a "Discount Days" rate structure that is in essence the inverse of CPP rates. On a limited number of Discount Days that are called in advance, the utility would charge a greatly reduced price during a mid-day block of time, thus encouraging electricity use at a time when increased use would be most valuable to the system and when higher demand would mitigate the risk that renewable generation might have to be curtailed. In exchange for the lower prices on Discount Days, off-peak rates would be raised in other hours in order to recover the revenue lost on Discount Days.

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[8] *See* D. 15-08-005, at p. 30. "With respect to the assertion by SEIA and CALSEIA that Peak Day Pricing should be added on top of Net Energy Metering, we agree they have a statutory right to the option. (Pub. Util. Code § 2827.)… We find that Peak Day Pricing is a ratesetting device intended to encourage conservation on those peak days when energy costs spike upwards. Peak Day Pricing is an available default rate, so it can in fact be used here in conjunction with Net Energy Metering."

[9] Studies have demonstrated the potential for over-generation conditions to occur in the middle of the day in the spring months, with the result that market prices could be negative, or renewable output would have to be curtailed if there was no market at all for some generation. See, for example, *Investigating a Higher Renewables Portfolio Standard in California*, https://ethree.com/documents/E3_Final_RPS_Report_2014_01_06_with_appendices.pdf

The utility's methodology for making CPP or Discount Day calls should be formalized and vetted so that stakeholders can ensure that the calls are properly capturing peak load or ramping events, or over-generation periods, and so that it is possible to forecast these events to some extent. Their frequency and duration should be limited to no more than four hours on three consecutive days. Historical data on the timing of local area peaks and distribution circuit peaks also need to be made widely available.

Critical Peak Pricing and Discount Days are examples of "targeted" or "demand responsive" TOU rates that would apply only when system conditions are most extreme and customers' demand response is most valuable. The Commission should consider a Targeted TOU structure that is based on either (1) a flat rate or (2) a simple two-period on-peak/off-peak TOU structure with relatively mild rate differentials, with an overlay of either CPP alone or both CPP and Discount Days rates to send customers a strong, targeted price signal at times when changes to their electric use are most valuable to the system. Ultimately, as customer loads become more controllable and as storage resources become more widespread, signals from the utility or system operator to indicate a Critical Peak or Discount Day can be integrated into autonomous customer responses to system conditions that both are helpful to the system and enhance the customer's own economics.

4. More Complex Rate Designs

The example of TOU rates with a moderate on- and off-peak differential overlaid with CPP and/or Discount Day rates is meant to illustrate that the aforementioned structural ideas are by no means exclusive of each other, and they could be combined in a variety of ways into rates that offer customers different levels of complexity and varying strengths of the resulting price signal. Obviously, the combination of these ideas can result in rate designs that are very

complex, such as the "spicy" TOU Pilot Rate Option 3 that SDG&E will be testing in its TOU pilots.[10] SEIA believes that, for rates that are intended to be widely adopted and perhaps to become the default rate, complexity needs to be tempered by the critical importance of offering rates that are simple and understandable to customers. In addition, widespread acceptance of more complex rate structures will require the adoption of advanced technologies and innovations that are not readily available in the market today, as well as more refined price signals from utilities. The "spicy" TOU Pilot Rate Option 3 that SDG&E is offering will be limited to a modest number of "early adopters," and the Commission has recognized that this rate is unlikely to be the default rate, and instead would be an optional offering.[11] Consistent with this approach, more complex rates should initially be optional, and will need to be accompanied by a conversation not just about consumer behavior, but also about the availability of advanced technology and devices to accommodate such complexity and encourage the myriad services that distributed energy resources can offer. A broader and deeper discussion of technology can pave the way for development of additional TOU rate designs that encourage and support these enabling technologies.

III. CONCLUSION

SEIA appreciates your consideration of these comments and looks forward to continued participation in this proceeding

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10 See Resolution E-4769.

11 *Ibid*., at pp. 40 and 42.

Respectfully submitted April 6, 2016 at San Francisco, California.

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