TESTIMONY OF WILLIAM A. MONSEN ON BEHALF OF THE VOTE SOLAR INITIATIVE CONCERNING RESIDENTIAL ELECTRIC RATE DESIGN REFORM
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I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is William A. Monsen. I am a Principal and Executive Vice-President at MRW & Associates, LLC (MRW). My business address is 1814 Franklin Street, Suite 720, Oakland, California.

Q. Please summarize your professional and educational background.

A. I have been an energy consultant with MRW since 1989. During that time, I have provided extensive analyses on electric power markets, particularly the West Coast power markets, for various end-users, financial institutions, gas pipelines and producers, Qualified Facility (QF) and independent power developers, and state agencies. I have provided expert witness testimony in numerous California regulatory proceedings concerning utility resource planning, the market structure of the electric power market, the cost-effectiveness of new resource additions, electric resource planning, power pricing for QF projects, the need for power, marginal cost analysis, revenue allocation and rate design, stranded costs, and California regulatory policies. I have also analyzed power markets in the western US, China, Korea, Wisconsin, and Massachusetts for independent power producers, financial institutions, and customers.

Prior to joining MRW, I worked at Pacific Gas & Electric Company (PG&E). At PG&E I held a number of positions, including Assistant Solar Engineer in
the Energy Conservation and Services Department, Rate Analyst in the Rate Department, Rate Economist, and a Decision Support Coordinator in the Economics and Forecasting Department. While at PG&E, I was responsible for providing analytical support to management’s decision-making process. This included working on the company’s initial efforts to quantify the benefits of Demand-Side Management (DSM) using production cost models, developing DSM forecasting models used for long-term planning studies, using Monte Carlo simulation techniques to analyze electric supply and demand uncertainty to quantify the value of resource flexibility, developing planning models as part of PG&E’s Long-Term Planning efforts, analyzing utility and non-utility investment opportunities using PG&E’s Strategic Analysis Model, and analyzing electric resource planning issues.

I hold a Master of Science degree in Mechanical Engineering from the Solar Energy Laboratory at the University of Wisconsin-Madison and a Bachelor of Science degree in Engineering Physics from the University of California at Berkeley. Please see Attachment A for my resume and a list of my testimonies.

Q. Have you previously testified before the California Public Utilities Commission?

A. Yes. I have previously testified before the California Public Utilities Commission (Commission) on behalf of the City of San Diego, the City of
Long Beach, Bear Mountain, Snow Summit, the Independent Energy Producers Association, the California Cogeneration Council, Duke Energy North America, the Alliance for Retail Energy Markets, the Center for Energy Efficiency and Renewable Technologies, the Local Governmental Commission Coalition, Clearwater Port, and Commercial Energy. I have also submitted testimony in proceedings before the state utility commissions in Oregon, Nevada, Colorado, Massachusetts, and Arizona.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of The Vote Solar Initiative (Vote Solar).

Q. What are Vote Solar’s interests in this proceeding?

A. Vote Solar is a non-profit grassroots organization working to fight climate change and foster economic opportunity by bringing solar energy into the mainstream. Vote Solar wants to ensure that changes to residential rate design approved in this proceeding do not harm customers that have already made investments in solar power and support continued customer investment in solar power. In particular, in this proceeding Vote Solar seeks to preserve “solar-friendly” time-of-use (TOU) rate options for both existing and new solar customers.

Q. Is Vote Solar concerned only with the TOU tariffs?

A. Vote Solar’s concern is more broadly to ensure the continued viability of the solar marketplace. To avoid duplication among intervenors, I will address
only TOU rate schedules in my opening testimony. Other parties will be submitting testimony on tiered rate schedules appropriate for solar customers. I may address tiered rate schedules and other aspects of the utilities’ applications in rebuttal testimony.

Q. Please summarize your conclusions and recommendations.

A. My recommendations and conclusions are as follows:

- Existing TOU rate schedules that are currently open to new customers should remain open to new customers. The existing rate structures should be maintained for these tariffs (e.g., customer charges should not be added and tier differentials should not be adjusted) to provide a meaningful rate option that is distinct from other TOU tariffs proposed by the utilities and that will support the continued adoption of solar.

- Net Energy Metering (NEM) customers that are currently on TOU rates should be grandfathered onto those rate schedules. This grandfathering should include the existing rate structures and, for PG&E’s E-7 and E-8, the existing rate differential as compared to the default tariff. This is appropriate because customers likely made solar investments based on these rate structures and rate differentials as a result of the strong encouragement of the Commission.
II. UTILITIES’ PROPOSALS FOR THEIR TOU TARIFFS

Q. Do all of the utilities currently have optional TOU tariffs?

A. Yes. The utilities currently have several categories of TOU tariffs:

1. All three utilities have tiered, TOU tariffs that are revenue neutral with their default tariffs. These are: Schedules E-6 and EL-6 for Pacific Gas and Electric (PG&E), TOU-D-T for Southern California Edison (SCE), and DR-TOU for San Diego Gas and Electric (SDG&E);

2. SDG&E also has a non-tiered TOU rate schedule, Schedule DR-SES;¹

3. PG&E additionally has four tariff options that are not considered revenue neutral with the default tariff and that are closed to new customers: Schedules E-7 and EL-7, which are tiered, TOU rate options, and Schedules E-8 and EL-8, which are tiered, seasonal rate options;

4. All three utilities additionally have TOU rate options applicable to customers with plug-in electric vehicles;²

5. PG&E additionally has a TOU tariff applicable to multi-family accommodations, Schedule EM-TOU; and

6. SCE additionally has a seasonal rate schedule, Schedule DS.

¹ SCE additionally has two non-tiered TOU rate schedules: Schedules TOU-D-1 and TOU-D-2. However, customers taking service under these rate schedules are being transitioned to Schedule TOU-D-T, in accordance with Decision (D.) 13-03-031. These tariffs are therefore not included in the proposals presented in this testimony.

² These are: Schedules E-9 and EV for PG&E, Schedules TOU-D-T EV and TOU-EV-1 for SCE, and Schedules EV-TOU, EV-TOU-2, and EPEV-X, EPEV-Y, and EPEV-Z for SDG&E.
Q. What are the utilities’ proposals with respect to their existing TOU rate options?

A. All three utilities propose to apply the structural changes that they have proposed for their default tariffs to their TOU tariffs. In practice, this means the utilities will add fixed customer charges to their TOU rate schedules, change the number of tiers, and change the rate differentials between tiers for the tiered, TOU rate schedules.

Furthermore, PG&E has proposed to close Schedules E-6 and EL-7 to new customers beginning January 1, 2015, and to eliminate Schedules E-6, EL-6, E-7, EL-7, E-8 and EL-8 in 2016. These are PG&E’s only TOU rate options that are currently available to customers in single-family homes that do not own electric vehicles.

Q. How do the utilities’ proposed optional TOU rate options compare with their existing TOU rate options?

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3 For SCE and SDG&E, see SCE and SDG&E’s Responses to Vote Solar Data Request 3, Question 2 (see Attachments B and C). For PG&E, see “Long-Term Residential Electric Rate Design Reform Proposal: Phase 1 Testimony,” R.12-06-013, February 28, 2014 (PG&E Phase 1 Testimony), p. 2-3, footnote 6.

4 There are limited exceptions. PG&E proposes no changes to the fixed charges that are already applied in Schedules E-8 and EL-8 and proposes no changes to its Schedule E-9 because this rate schedule will soon be eliminated (see PG&E Phase 1 Testimony, p. 2-2, footnote 4). In addition, SCE and SDG&E have not specified whether the changes proposed for their default tariffs would be applied also to the tariffs applicable to customers with electric vehicle charging load.

5 PG&E Phase I Testimony, p. 2-39.

A. The rate options proposed by the utilities are different than their current rate offerings in a number of ways. I summarize the changes for each utility below.

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**A. PG&E**

PG&E’s Schedule E-6 is currently a four-tiered TOU rate with three summer TOU periods, two winter TOU periods, and no customer charge. Under PG&E’s proposal, in 2015, Schedule E-6 would be restructured to add a customer charge and reduce the number of tiers to three. In 2016, PG&E would terminate Schedule E-6. To remain on a TOU tariff, most customers would need to migrate to PG&E’s proposed new TOU rate, E-TOU, which has a fundamentally different rate structure, with a single tier and just two summer TOU periods. Current E-6 customers would therefore face significant tariff changes two years in a row under PG&E’s proposal. Table 1 summarizes key differences between PG&E’s current Schedule E-6 and its proposed TOU rate option.

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7 Schedule EL-6 has a similar structure. Unless otherwise noted, comments related to Schedule E-6 also apply to Schedule EL-6.
Table 1: PG&E's TOU Rate Proposal for E-6 Customers

<table>
<thead>
<tr>
<th></th>
<th>E-6 Current</th>
<th>E-6 2015</th>
<th>E-TOU 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiered?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Number of Tiers</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td># Summer TOU Periods</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Customer Charge</td>
<td>$0</td>
<td>$5</td>
<td>$10</td>
</tr>
</tbody>
</table>

B. SDG&E

SDG&E’s proposed optional TOU rate at first glance appears structurally similar to SDG&E’s current Schedule DR-SES: Schedule DR-SES and SDG&E’s proposed new optional TOU rate schedule are both single-tiered TOU rates with three summer TOU periods. However, Schedule DR-SES and SDG&E’s new optional TOU rate schedule differ in that the proposed new optional TOU rate schedule adds a third winter TOU period, which is not part of either Schedules DR-TOU or DR-SES. It is important to note that SDG&E’s proposed rate option is very different than SDG&E’s other existing TOU rate (Schedule DR-TOU), which has four tiers and two summer TOU periods. Moreover, the proposed optional TOU rate has large demand-differentiated fixed charges ranging from $27.78 to $79.53 per month instead of much smaller minimum bills (about $5 per month) in the existing TOU rates. Table 2 summarizes the differences between the existing and proposed rates.

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8 PG&E Phase I Testimony, Appendix A-1.
Table 2: SDG&E’s Current TOU Options and Proposed New Optional TOU Rate Option

<table>
<thead>
<tr>
<th></th>
<th>DR-TOU Current</th>
<th>DR-SES Current</th>
<th>Proposed New Optional TOU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiered?</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Number of Tiers</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td># Summer TOU periods</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td># Winter TOU periods</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Customer Charge</td>
<td>N/A</td>
<td>N/A</td>
<td>$28-$80</td>
</tr>
<tr>
<td>Minimum Bill</td>
<td>$0.17/day</td>
<td>$0.17/day</td>
<td>N/A</td>
</tr>
</tbody>
</table>

SDG&E’s proposed changes to its TOU rates significantly increase fixed charges and reduce variable charges compared to its current TOU rate options. For example, summer energy charges in the proposed TOU rate are lower than in Schedule DR-SES by 35 percent in the on-peak period, 31% in the semi-peak period, and 40 percent in the off-peak period. These structural choices have great bearing on the economics of solar PV projects.

C. SCE

SCE’s current Schedule TOU-D-T has two tiers, two summer and two winter TOU periods, and no customer charge. The dividing line for the two tiers is 130% of baseline. SCE proposes two new TOU rate options, both with three

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10 SDG&E Rate Schedule DR-TOU, August 2014.
11 SDG&E Rate Schedule DR-SES, August 2014.
12 SDG&E Phase 1 Testimony, p. CF-49.
13 Calculated by comparing total commodity, delivery and DWR bond charges under Schedule DR-SES in February 2014 with the proposed total commodity, delivery, and DWR bond charges for the new proposed optional TOU rate schedule (which is revenue neutral with February 2014 tariffs). SDG&E Phase 1 Testimony, p. CF-49, and SDG&E Rate Schedules DR-SES, EECC, and DWR-BC, February 2014.
14 SCE Rate Schedule TOU-D-T, August 2014.
summer and three winter TOU periods. The first new option also has two
tiers; however, this new rate option has a smaller first tier and a larger second
tier. This option also has a customer charge, which starts at $5 per month in
2015.

SCE’s second proposed TOU rate option is geared towards higher usage
customers. It has a single tier (i.e., it does not have a baseline credit) and a
much higher customer charge (starting at $16 per month) than the current
TOU rate. Table 3 summarizes the differences between the existing and
proposed rate options.

<table>
<thead>
<tr>
<th></th>
<th>TOU-D-T Current</th>
<th>TOU-D Option A</th>
<th>TOU-D Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiered?</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Number Of Tiers</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Tier Division</td>
<td>130% of Baseline</td>
<td>Baseline</td>
<td>N/A</td>
</tr>
<tr>
<td># Summer TOU Periods</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td># Winter TOU Periods</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Customer Charge</td>
<td>$0</td>
<td>$5-$10</td>
<td>$16</td>
</tr>
</tbody>
</table>

16 SCE Phase 1 Testimony, p. 47. SCE refers to this as a non-tiered rate schedule, with a baseline credit.
17 SCE Phase 1 Testimony, p. 47, and SCE Testimony in A.13-12-015, p. 24 (see Attachment D).
18 The Schedule D customer charge would apply. This charge starts at $5 per month in 2015 and increases to $10 per month by 2017, followed by inflation increases. SCE’s Response to Vote Solar Data Request 3, Question 2 (see Attachment B)
D. Summary Observations

Q. Can you make any general comments about the various proposed changes to the IOUs’ TOU rates?

A. The utilities seem to have different opinions about the appropriate structure for TOU rates. PG&E is proposing to reduce the number of summer TOU periods from three to two, while SCE and SDG&E are proposing exactly the opposite (i.e., moving from two to three TOU periods). SCE proposed to have two tiers for two of its TOU tariff options but all three utilities propose TOU rates with a single tier as well. This indicates to me that there is hardly a consensus regarding the “proper” TOU rate design.

Q. Are the utilities’ proposed rate changes uniformly harmful to all customers?

A. No, these rate changes are likely to have differing impacts on customers. They tend to be beneficial to high usage customers but harmful to low usage customers. In addition, customers that have made the most significant investments in solar photovoltaic (PV) systems relative to their energy loads will generally fare poorly under the proposed TOU tariffs because, as low net energy users, they will be harmed by the introduction of fixed customer charges.
The utilities’ proposed consolidation of tiers and reductions to the tier differentials as they apply to TOU rates are likely also to benefit high usage customers and to harm low usage customers including those customers that have made the most significant investments in solar PV. The magnitude of the impacts will be driven by the specifics of how these new rates are structured (i.e., which tiers are consolidated and where the tier differentials are set).

Q. Do you oppose the IOUs’ proposed optional TOU rates?
A. Not necessarily. I think that the IOUs are experimenting with their TOU rates. These experiments may be useful for understanding how to encourage more customers to adopt TOU rates. As I discuss further below, I am not opposed to rate options for customers as long as there are options that will be attractive for all customers and not just for a select class of customers (e.g., high-usage customers).

Q. Are the utilities proposing other changes to their TOU rates in other proceedings?
A. Yes. SCE and SDG&E have both proposed to change the definition of their TOU periods for at least some customers in their ongoing Rate Design Window proceeding.¹⁹

Q. Are Rate Design Window proceedings the appropriate place to consider such sweeping changes to TOU rates?

A. No. The appropriate place to consider such changes is in a revenue allocation and rate design phase of a General Rate Case. In the revenue allocation and rate design phase of General Rate Case proceedings, a much broader range of parties that are affected by a change in TOU periods will be participating. This is because revisions to TOU periods would have impacts on a number of important issues that are not addressed in a Rate Design Window proceeding, such as cost allocation and rate design. For these reasons, the Commission should only consider changes in TOU periods in revenue allocation and rate design phases of General Rate Cases.

III. THE PRINCIPLES SET FORTH BY THE COMMISSION SHOULD GUIDE THE RESIDENTIAL RATE DESIGN RESTRUCTURING

Q. What principles have the Commission established to guide the residential rate restructuring?

A. In the November 2012 scoping memo in this proceeding, the Commission established ten principles to guide the evaluation of residential rate design proposals. These principles are as follows:

1. Low-income and medical baseline customers should have access to enough electricity to ensure basic needs are met at an affordable cost;

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2. Rates should be based on marginal cost;
3. Rates should be based on cost-causation principles;
4. Rates should encourage conservation and energy efficiency;
5. Rates should encourage reduction of both coincident and non-coincident peak demand;
6. Rates should be stable and understandable and provide customer choice;
7. Rates should generally avoid cross-subsidies, unless the cross-subsidies appropriately support explicit state policy goals;
8. Incentives should be explicit and transparent;
9. Rates should encourage economically efficient decision-making; and
10. Transitions to the new rate structures should emphasize customer education and outreach that enhances customer understanding and acceptance of new rates, and minimizes and appropriately considers the bill impacts associated with such transitions.

Q. Do TOU rates comport with some of these principles?

A. Yes. As discussed in the May 2013 proposal by Vote Solar and The Solar Energy Industries Association, principles two through five support the use of a TOU rate structure:

By more closely aligning rates with the utility’s underlying marginal costs, TOU rates will encourage conservation and energy efficiency as well as the reduction of both coincident and non-coincident peak demand, all of which are stated Commission goals.21

Q. How does the manner in which TOU rates are offered affect whether or not they satisfy other principles?

A. Principles 6-10 are directly related to the types of TOU rates that are offered and the rate options that are made available to customers. Principle 6 requires that rates be stable and understandable and provide customer choice.

Principles 7 and 8 recognize the limited role for cross-subsidies and incentives to support policy goals. Principle 9 requires that rates encourage economically

efficient decision-making. Principle 10 recognizes the importance of appropriate transitions to new rates, highlighting the need for customer understanding and acceptance of rate changes and the consideration of bill impacts in implementing these transitions. I discuss each of these issues below.

Q. Why is it important that rates be stable, understandable, and provide customer choice?

A. Rate stability and understandability are important to promote customer acceptance and to reduce rate shock. Customer choice increases flexibility for customers and may also promote customer acceptance. In addition, offering multiple tariff options provides multiple avenues to encourage customer behaviors that benefit the system as a whole, such as investments in distributed generation, plug-in electric vehicles, energy efficiency, and other technologies that support Commission goals. Some customers are better able to make these investments and to respond to price signals than others. These customers should be given the proper motivation to make these investments, to the benefit of all customers. To provide low-income customers with the choice and opportunities afforded other customers, CARE rates should be offered for each rate option that is provided.

Q. What is the importance of the Commission’s principles related to cross-subsidies and incentives?
A. The Commission recognizes in Principles 7 and 8 that, while generally speaking rates should be developed based on cost-causation principles, there is a role for cross-subsidies and rate incentives as long as (i) they are transparent and explicit and (ii) they are used to further the state’s policy goals.

Q. How can rates encourage economically efficient decision-making?

A. The Commission has found that “dynamic pricing can lower costs by more closely aligning retail rates and wholesale system conditions, thereby promoting economically efficient decision-making.”\(^{22}\) As further explained in the November 2012 scoping memo, “Such economically efficient decision-making could include off-peak charging of electric vehicles, investment in distributed photovoltaic energy, and adoption of cost effective demand response measures aided by innovative technologies and services that support reduced or shifted consumption patterns.”\(^{23}\)

Q. Why is it important to minimize bill impacts associated with transitions in rate structures?

A. Rate structure changes will inevitably produce both “winners” and “losers” (i.e., customers whose bills increase or decrease on account of the structural changes in rates). For example, a shift to TOU rates will generally increase bills for customers that use higher-than-average shares of load during the on-

\(^{22}\) D.08-07-045 in A.06-03-005, July 31, 2008, p. 2.
peak period and decrease bills for customers that use higher-than-average shares of load during the off-peak period. These bill changes provide the “losing” customers the incentive to shift load away from the peak TOU periods. The logistical and technological changes needed to obtain the load shift, however, cannot always be made overnight. A transition period during which bill impacts are minimized allows the customer to respond to the new rate structure without getting penalized with large bill increases for behaviors that were consistent with prior price signals. More generally, it prevents rate shock, which is a significant impediment to customer acceptance. Finally, before requiring customers to change rate schedules, it is important to ensure that customers have an opportunity to recover the costs of investments that they made in technology to control costs under their existing rate schedules.

IV. “SOLAR-FRIENDLY” TOU RATE OPTIONS SHOULD BE AVAILABLE FOR ALL CUSTOMERS

Q. How should the principles outlined above be applied to offering TOU rate options?

A. As discussed above, the Commission has already recognized the benefits of TOU rates in meeting the principles of aligning rates with costs and promoting economically efficient decision-making and has cited investment in distributed solar PV as an example of the economically efficient decision-making that the Commission is trying to promote. However, not all TOU

rate structures will encourage customer investments in solar PV. To meet the
Commission’s goals and to maintain a healthy solar marketplace in California,
“solar-friendly” TOU rate options should be offered in addition to the utilities’
proposed TOU rate offerings. Providing multiple TOU rate offerings is
consistent with the Commission’s principle that rate offerings should support
customer choice.

Q. What are some of the parameters of a “solar-friendly” TOU rate
structure?

A. The TOU rate structure that would promote the most investment in solar PV is
a volumetric rate structure without a customer charge or a minimum charge. It
has significant rate differentiation between TOU periods. It also has a tiered
rate structure with significant rate differentiation between the top-tier and
lower-tier rates. Vote Solar recommends that for all new TOU tariffs, the
TOU rate structure should be revenue neutral with the default tariff.

Q. Do you consider the utilities’ proposed TOU rate options to be “solar-
friendly”?

A. No. The utilities’ proposed TOU rate options all include fixed charges, less
rate differentiation between tiers, and fewer tiers than in the utilities’ current
tiered, TOU tariffs.

Q. What “solar-friendly” TOU options do you recommend to be offered?
A. To maintain rate stability (Principle 6), I recommend that the utilities continue to offer their current revenue-neutral TOU offerings without modifying their current rate structures. These are PG&E’s Schedule E-6, SCE’s Schedule TOU-D-T, and SDG&E’s Schedule DR-TOU.\textsuperscript{26}

Q. What do you mean by rate structures?

A. Rate structures are the framework upon which rates are built. They include peak demand charges, non-coincident demand charges, number of tiers, number of TOU periods, rate differentials between tiers and between TOU periods, customer charges, and the share of revenue collected via energy charges versus demand charges. Making significant changes to these structural elements by, for example, adding a demand charge or a customer charge to a volumetric tariff or reducing the differential between tiers or between TOU periods can have significant impacts on the economics of a customer’s solar PV investment.

Q. How does your proposal differ from PG&E’s proposal?

A. PG&E has proposed to close Schedule E-6 to new customers in January 2015 and to eliminate Schedule E-6 entirely in 2016.\textsuperscript{27} Under my proposal, Schedule E-6 would continue to be offered with its current rate structure.

\textsuperscript{26} To the degree that SDG&E’s Schedule DR-SES is revenue neutral, it should be included in this list. Also, the low income rate options for these tariffs should be retained.

\textsuperscript{27} PG&E Phase I Testimony, p. 2-39.
Q. How does your proposal differ from SCE and SDG&E’s proposals?

A. SCE and SDG&E have proposed to maintain their current TOU rate schedules in name only. In practice, their proposals would effectively eliminate their current TOU rate schedules and replace them with new rate schedules that impose fixed charges and have fewer tiers and smaller rate differentials between tiers than their current TOU tariffs. Under my proposal, these structural changes would not occur. The utilities’ TOU rates would continue to be offered without a customer charge and with the current number of tiers and rate differentials between tiers.

Q. Why should the Commission reject the utilities’ proposals to effectively eliminate the current TOU rate offerings?

A. Eliminating “solar-friendly” rate options, as the utilities have proposed, may have chilling effects on new investments in solar, particularly when combined with changes to the NEM tariff that are under development in Rulemaking (R.) 14-07-002. The utilities propose to effectively eliminate these rate schedules (either by eliminating them completely or by changing their rate structures) without offering any demonstration that these rate schedules are flawed or any assessment of how this action would affect the Commission’s policy goals of supporting investments in solar PV.

Q. Does the Commission have the authority to maintain the current rate structures without adding a fixed charge?
A. Yes. Assembly Bill 327, which provides the Commission authorization to approve fixed charges, up to specified limits, explicitly states that it “does not require the commission to approve any new or expanded fixed charge.”

Q. What are the benefits of offering a TOU rate schedule without a fixed charge?

A. To provide meaningful customer choice, different tariff offerings should have different rate structures. A rate option without a fixed charge will be attractive to solar PV customers, customers that are considering investments in energy-efficiency, low-usage customers, and other customers that dislike fixed charges. Offering this as a TOU rate option will provide an incentive for these customers to select a TOU rate, thereby furthering the Commission’s goal of moving towards dynamic pricing rates.

Q. Is your proposal compatible with the objectives of this rulemaking?

A. Yes, it is. As evidenced by the ten principles set forth by the Commission, this rulemaking is designed not with a single objective, but with the objective of balancing the Commission’s policy interests. These interests cover a broad range of issues, including cost-based ratemaking, encouraging investments in solar PV and other energy efficient technologies, and ensuring affordable energy to meet the basic needs of low-income customers.

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28 Assembly Bill 327, Section 5, October 7, 2013 (see Attachment E).
As noted above, my proposal is consistent with all of the Commission’s principles and promotes a number of Commission policy objectives. It is designed to encourage the adoption of TOU rate structures, which better align rates with costs, consistent with Principles 2 and 3. It is also designed to promote investments in solar energy and energy efficiency, consistent with Principles 4, 5, and 9. Maintaining current tariff options offers rate stability and provides customer choice, consistent with Principle 6. Maintaining only those options that are revenue neutral with respect to the default tariff avoids cross-subsidies, consistent with Principles 7 and 8.

Q. Would these tariffs remain open to all customers and not just to customers that install solar PV systems?

A. Yes. There is no need to limit access to these tariffs since they are revenue neutral, meaning that the customers on these existing tariffs are fully covering their cost of service. For that reason, all customers should have the option to take service under these tariffs, not just customers with solar PV systems. However, as discussed in the next section, if the Commission is unwilling to keep these “solar-friendly” rates open to all customers, the Commission should, at a minimum, grandfather existing NEM customers onto their existing TOU tariffs.

V. NEM CUSTOMERS CURRENTLY TAKING SERVICE UNDER TOU RATE SCHEDULES
SHOULD BE GRANDFATHERED ON THE
EXISTING TOU RATE SCHEDULES

Q. What additional considerations should be made for existing NEM customers?
A. Regardless of what the Commission determines with regard to maintaining “solar-friendly” TOU options to promote new investments in solar PV, the Commission should allow NEM customers already on TOU rate schedules to remain on their current rate schedules with existing rate structures, at least for a transition period that will provide them a fair opportunity to recoup their long-term investments in their solar PV systems.

Q. How does your proposal to grandfather existing NEM customers on their TOU tariffs differ from your proposal to keep current TOU tariffs open to all customers?
A. As discussed in the previous section, my proposal to keep current “solar-friendly” TOU tariffs open to all customers applies only to the utilities’ revenue neutral tariffs. As explained below, my proposal for grandfathering current NEM customers applies to both the revenue neutral tariffs and also to tariffs that provide discounted rates relative to the utility’s default residential tariff.

Q. What tariffs are included in your grandfathering proposal?
A. My grandfathering proposal applies to all TOU tariffs that serve NEM customers except for those that have already been scheduled for elimination.
These may include the following tariffs: PG&E Schedules E-6, E-7, E-8, E-9, EL-6, EL-7, EL-8, EM-TOU, and EV; SCE Schedules TOU-D-T, TOU-D-TEV, and DS; and SDG&E Schedules DR-TOU, DR-SES, EV-TOU, EV-TOU-2, EPEV-X, EPEV-Y, and EPEV-Z.

A. **NEM Customers Have Made Long-Term Investments in PV Systems**

Q. Has the Commission previously found that some solar PV investments have long payback periods?

A. Yes. The Commission has found that “20 years constitutes a reasonable payback period” for behind-the-meter NEM solar PV systems.29

Q. What are the benefits to these customers of their investments in their NEM solar PV systems?

A. The benefits include bill savings and tax credits.30

Q. What are the benefits to all ratepayers resulting from customers’ investments in NEM solar PV systems?

A. The benefits to other ratepayers include avoided capacity, energy, transmission, and distribution costs.31 A broad range of other benefits also accrue to all ratepayers, including job growth and other economic benefits,

31 Standard Practice Manual 2001, p. 23 (see Attachment F).
environmental benefits including reduced air and greenhouse gas emissions, and public health benefits.

Q. From this, can you conclude that ratepayers other than the owners of NEM PV systems benefit from the investments by customers in their NEM PV systems?

A. Yes. All customers benefit from investments in solar PV systems. Those benefits would not be possible if not for the early adopters who were willing to take risks and install solar PV systems, even when facing long payback periods. Those customers have helped establish the vibrant market for solar PV systems that the Commission encouraged when it established the NEM program.

B. Customers’ Past Investments in Solar PV Projects Must be Protected to Avoid Discouraging Future Investments and Harming All Customers

Q. Are there future benefits to other customers from protecting past customers’ investments in solar PV systems?

A. Yes. If the Commission allows rate design changes to erode the value of customers’ past investments in solar PV systems, the Commission may have a difficult time encouraging future customer investments of any kind that have extended payback periods, because customers may perceive added risk of regulatory change that could undermine their investment. Customer investments must therefore be protected in order to provide the reasonable
degree of regulatory certainty that is needed to allow for future customer-side
grid-supporting investments that benefit all ratepayers.

Q. Are there other reasons that customers that have made Commission-
promoted investments based on a particular rate design should maintain
access to that rate design?

A. Yes. It is a basic matter of fairness to protect customer investments that have
been promoted and supported by the Commission. It is also important to
maintain rate stability, which is one of the rate design principles identified by
the Commission and one of Mr. Bonbright’s ten attributes of a sound rate
structure. Mr. Bonbright described this attribute as: “Stability and
predictability of the rates themselves, with a minimum of unexpected changes
seriously adverse to ratepayers and with a sense of historical continuity.”
Eliminating or significantly modifying a tariff option that was used to support
a recent customer investment can create serious adverse harm to the customer
and removes the sense of predictability and historical continuity of the
utility’s rate structures. This directly harms the customers that have made
investments and also harms other ratepayers by discouraging future
investments in grid-supporting technologies.

33 Bonbright, Danielsen, and Kamerschen “Principles of Public Utility Rates,” 1988, p. 383 (see
Attachment G).
C. Commission Precedent Favors Maintaining Consistent Rate Structures to Protect Customer Investments in Solar PV

Q. Has the Commission recognized the importance of grandfathering rate structures for certain customers in order to protect customer investments?

A. Yes. In 2014 alone, the Commission has applied this principle at least three times: in D.14-01-002 in Phase 2 of SDG&E’s General Rate Case (GRC),\(^{34}\) in D.14-03-041 in the NEM transition period proceeding,\(^{35}\) and in the scoping memo in SDG&E’s 2015 Rate Design Window proceeding.\(^{36}\) I discuss each of these below.

i) Phase 2 of SDG&E’s 2012 Test Year General Rate Case

Q. How did the Commission recognize the importance of maintaining rate structures in order to protect customer investments in SDG&E’s GRC Phase 2 decision?

A. In D.14-01-002, the Commission denied a partial settlement agreement that had been entered into by SDG&E, the City of San Diego, the Solar Energy Industries Association, the City of Chula Vista, and the San Diego Solar Coalition. The settlement agreement would have shifted distribution costs from peak demand charges to non-coincident demand charges for medium and large commercial and industrial customers, including customers on SDG&E’s “solar-friendly” tariff, Schedule DG-R, which is open to non-residential

customers with renewable distributed generation. Existing DG-R customers would additionally have been eligible to receive a one-time bill credit to defray the incremental costs associated with the new rate design.\(^{37}\)

San Diego Consumers Action Network (SDCAN) and San Diego County Public Agencies (SDCPA) opposed the proposed settlement agreement, at least in part on the grounds that it would harm some existing solar customers. SDCPA, which is a coalition of school districts and water districts that have invested in solar, stated that they “relied on the economics of SDG&E’s Distributed Generation-Renewable (DG-R) tariff” in making their solar investments and that the proposed rate design “decimates” the economic assumptions underlying their investments.\(^{38}\)

The Commission found merit in the arguments of SDCAN and SDCPA and rejected the settlement agreement.

Q. **Was it reasonable for SDCPA to rely on the structure of an existing tariff for a long-term investment?**

A. Yes. It would not be reasonable to assume that future rate levels will remain the same over an extended period; however, it is reasonable to assume that rate structures will remain the same. Indeed, it is difficult to imagine what other assumption would be more reasonable.

\(^{38}\) D.14-01-002 in A.11-10-002, p. 31.
Q. How did the Commission address the reasonableness of SDCPA’s reliance on the economics of an existing tariff for a long-term investment?

A. In rejecting the proposed settlement agreement, the Commission gave little weight to SDG&E’s argument that it was not reasonable for SDCPA to assume that the rate design would not change, referring to it as “SDG&E’s perspective.”\(^{39}\) The Commission gave further credence to the reasonableness of SDCPA’s assumption of consistency in rate design by stating that SDG&E’s waving aside SDCPA’s concerns heightened the Commission’s concerns about the settlement.\(^{40}\)

Q. What is your key conclusion from this decision?

A. The Commission took seriously SDCPA’s concern that the proposed change in rate structure would undermine the economics of solar investments by SDCPA’s members and took the notable step of rejecting a multi-party settlement agreement in order to maintain rate structures that would protect the economic viability of these investments in NEM solar PV systems.

ii) The NEM Transition Period Proceeding

Q. Is there another recent Commission decision that recognized the importance of maintaining rate structures in order to protect customer investments in NEM systems?

\(^{39}\) D.14-01-002 in A.11-10-002, p. 33.

\(^{40}\) D.14-01-002 in A.11-10-002, p. 33.
A. Yes. In D.14-03-041 (NEM Grandfathering Decision), the Commission established a transition period of 20 years from the customers’ distributed generation interconnection date during which customers already on NEM tariffs may continue to receive service on the previously applicable NEM tariff.\textsuperscript{41} The Commission developed this transition period to “ensure that customers who interconnect renewable distributed generation systems under the currently applicable net energy metering program have a reasonable opportunity to recoup the costs of their investment in those systems.”\textsuperscript{42} The Commission further found “that adopting a transition period that denies customer-generators the opportunity to realize their expected benefits would not be in the public interest, to the extent that it could undermine regulatory certainty and discourage future investment in renewable distributed generation.”\textsuperscript{43} The Commission also noted “the desirability of ensuring that customers have an opportunity to receive a return somewhat consistent with their expectations.”\textsuperscript{44}

\textbf{iii) SDG&E’s 2015 Rate Design Window}

Q. How was the importance of maintaining rate structures in order to protect customer investments in solar PV projects noted in the Assigned Commissioner’s scoping memo in SDG&E’s 2015 Rate Design Window?

\textsuperscript{41} D.14-03-041 in R.12-11-005, p. 2.
\textsuperscript{42} D.14-03-041 in R.12-11-005, p. 3.
\textsuperscript{43} D.14-03-041 in R.12-11-005, p. 20.
\textsuperscript{44} D.14-03-041 in R.12-11-005, p. 20.
A. In A.14-01-027, SDG&E requested changes to its TOU period definitions. Commissioner Florio’s scoping memo for that proceeding explicitly suggests that intervenors may include proposals to grandfather the current TOU period definitions for customers who have already made investments based on existing TOU period definitions to avoid adverse harm from the structural change in rates:

Finally, I am concerned that SDG&E’s proposed changes will affect customers with solar energy systems who are already on TOU rates, and who made their investment in those systems based on the existing definitions of TOU periods in SDG&E territory. Intervenor testimony may include proposals to “grandfather” these customers to avoid adverse effects from any future TOU period changes; SDG&E should respond to any such proposals in its rebuttal testimony.45

iv) Conclusion

Q. What is your conclusion with regard to maintaining rate structures to protect customer investments?

A. The Commission has clearly recognized the importance of maintaining rate structures to protect Commission-promoted customer investments in solar energy systems. There are two main reasons for this: (1) to ensure fairness to customers that have made significant financial investments in solar PV systems and (2) to prevent the harm that could come from undermining regulatory certainty in the Commission’s rate setting. Without the regulatory certainty that rate structures will remain in place long enough to provide a fair opportunity to recoup their investment, customers may not have the

confidence to make the significant investments required for distributed
generation, electric vehicles, and other technologies needed to meet the State’s
energy policy and greenhouse gas reduction goals.

D. Specific Actions Must be Taken in This Proceeding to Protect
Customers’ Investments in Solar

Q. What actions are needed in this proceeding to maintain TOU rate
structures to protect customer investments?
A. With regard to TOU tariffs, the Commission can protect customers’
investments in solar PV systems by grandfathering current NEM customers on
their existing TOU rate schedules with the existing rate structures.

Q. How does this differ from the utilities’ proposals?
A. As discussed above, the utilities all have proposed to apply the rate structure
changes proposed for their default tariffs to their TOU tariffs, too. This
involves adding customer charges, consolidating tiers, and reducing the rate
differential between tiers. Under my proposal, current NEM customers would
be able to remain on the existing TOU tariffs without these structural changes.
The rate levels in these grandfathered tariffs would change over time with the
change in overall revenue requirements, consistent with how rates are adjusted
in the revenue allocation and rate design phase of the utilities’ General Rate
Cases, but the rate structures would remain unchanged.
In addition, PG&E has proposed to close Schedule E-6 in January 2015 and to eliminate Schedules E-6, E-7, and E-8 in January 2016. Under my proposal, these rate schedules would remain open to NEM customers that currently take service under these rate schedules. In addition, as discussed above, Schedule E-6 and other revenue-neutral tariffs would remain open to all customers.46

i) NEM Customers Should be Allowed to Remain on their Current TOU Rate Schedules, with their Current Rate Structures in Place, for a Transition Period

Q. Do many NEM customers take service under PG&E’s current TOU schedules?

A. Yes. PG&E’s Additional Supplemental Testimony, which is based on 2011 load data, shows that more than 60 percent of PG&E’s NEM customers take service under TOU rate schedules.47

46 References in this section to Schedules E-6, E-7, and E-8 pertain also to Schedules EL-6, EL-7, and EL-8, respectively.
Table 4: Rate Schedule Distribution of PG&E’s NEM Customers

<table>
<thead>
<tr>
<th>Rate Schedule</th>
<th>Number of NEM Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1 (Tiered)</td>
<td>14,798</td>
</tr>
<tr>
<td>TOU Rate Schedules</td>
<td></td>
</tr>
<tr>
<td>E-6</td>
<td>9,905</td>
</tr>
<tr>
<td>E-7</td>
<td>12,231</td>
</tr>
<tr>
<td>E-8(^{48})</td>
<td>893</td>
</tr>
<tr>
<td><strong>Subtotal NEM TOU</strong></td>
<td><strong>23,029</strong></td>
</tr>
<tr>
<td><strong>Total NEM</strong></td>
<td><strong>37,827</strong></td>
</tr>
<tr>
<td><strong>% NEM on TOU schedules</strong></td>
<td><strong>61%</strong></td>
</tr>
</tbody>
</table>

Q. What would be the customer bill impact if PG&E’s current TOU schedules were eliminated, as proposed by PG&E?

A. As discussed above, PG&E proposes to (1) impose structural rate changes on its TOU tariffs in 2015 and then (2) to eliminate these rate schedules entirely in 2016. Each of these changes represents a significant change and, in most cases, the same customers would be harmed by both sets of changes. To examine the impact of these changes, I evaluated the cumulative bill impacts for PG&E’s E-6 NEM customers for these two transitions. To simplify the analysis, I focused on customers with 100 kWh to 550 kWh per year of net energy usage. These customers make up 56 percent of PG&E’s Schedule E-6 NEM customers, covering the 25\(^{th}\) to 75\(^{th}\) percentile of Schedule E-6 NEM customers by usage.\(^{49}\) Focusing on these customers avoids complications associated with customers with negative net energy over the course of the year.

\(^{48}\) Schedule E-8 is a seasonal rate schedule, which is a rudimentary form of a TOU rate schedule.

\(^{49}\) Calculated from PG&E Additional Supplemental Testimony, p. 41.
and also excludes the high-usage customers, who tend to benefit from
PG&E’s proposed changes in TOU rates.

As shown in Table 5, for many of these mid-range E-6 NEM customers,
PG&E’s proposals would result in significant bill increases in both 2015 and
2016. On average, these customers would face an 11 percent increase in 2015,
followed by a 23 percent increase in 2016, for a two-year increase of 37
percent.\(^{50}\)

<table>
<thead>
<tr>
<th>Usage</th>
<th>Number of Customers</th>
<th>2015 Bill Impact</th>
<th>2016 Bill Impact</th>
<th>Two-Year Bill Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - &lt; 150 kWh</td>
<td>659</td>
<td>23%</td>
<td>55%</td>
<td>91%</td>
</tr>
<tr>
<td>150 - &lt; 200 kWh</td>
<td>707</td>
<td>20%</td>
<td>38%</td>
<td>66%</td>
</tr>
<tr>
<td>200 - &lt; 250 kWh</td>
<td>730</td>
<td>15%</td>
<td>28%</td>
<td>47%</td>
</tr>
<tr>
<td>250 - &lt; 300 kWh</td>
<td>682</td>
<td>10%</td>
<td>20%</td>
<td>33%</td>
</tr>
<tr>
<td>300 - &lt; 350 kWh</td>
<td>640</td>
<td>7%</td>
<td>16%</td>
<td>24%</td>
</tr>
<tr>
<td>350 - &lt; 400 kWh</td>
<td>609</td>
<td>6%</td>
<td>12%</td>
<td>18%</td>
</tr>
<tr>
<td>400 - &lt; 450 kWh</td>
<td>538</td>
<td>4%</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>450 - &lt; 500 kWh</td>
<td>476</td>
<td>3%</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>500 - &lt; 550 kWh</td>
<td>366</td>
<td>2%</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>5,407</td>
<td>11%</td>
<td>23%</td>
<td>37%</td>
</tr>
</tbody>
</table>

Q. Are these bill increases reasonable?
A. No. Double-digit increases two years in a row as a result of PG&E’s proposal
is contrary to the Commission’s Principle 10, which requires that the bill
impacts associated with a transition to a new rate structure be appropriately
considered and minimized. Moreover, the cumulative 37 percent increase is a
staggering level of increase, particularly given that Schedule E-6 is already

\(^{50}\) \(137\% = 111\% \times 123\%\).
\(^{51}\) PG&E Additional Supplemental Testimony, pp. 41 and 49.
revenue neutral with respect to Schedule E-1. NEM customers that have made investments based on the existing E-6 TOU rate schedule should not be forced to adopt new rate structures that impose such bill impacts.

Q. Isn’t it the case that PG&E’s bill impact assessment shows net benefits to Schedule E-6 customers in 2016 from the transition to the new Schedule E-TOU?

A. Yes, this is correct. For all Schedule E-6 customers (i.e., high usage, low usage, and negative usage customers), PG&E finds an average bill reduction of 7 percent for E-6 customers migrating to Schedule E-TOU.52

Q. How do you respond to this?

A. This average “benefit” masks the significant harm that is caused to certain TOU customers. PG&E’s average bill impact measure includes both positive bill impacts and negative bill impacts.53 More importantly, PG&E’s bill impact measure is an average bill impact. The average bill impact is skewed by the inclusion of higher-usage customers in the average, since the higher usage customers tend to have lower bills under PG&E’s Schedule E-TOU than under Schedule E-6. The averaging masks the thousands of low-usage customers whose bills would be increased substantially due to this forced

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52 PG&E Additional Supplemental Testimony, p. 11.
53 Some E-6 NEM customers have negative monthly usage and see small increases in their bills. However, since their bills are negative, these customers show a percentage decrease in their monthly bills. See PG&E Additional Supplemental Testimony, p. 41.
migration. For example, 46 percent of E-6 customers would have bill increases greater than 20 percent when migrating to E-TOU.54

Q. Would high-usage NEM customers be harmed by your proposal?

A. No. Under my proposal, high-usage customers would retain the option to migrate to Schedule E-TOU, where their bills would likely be lower. Unlike PG&E’s proposal, my proposal offers additional choice to existing TOU customers and does not remove any options.

Q. What would be the customer impacts if SCE’s and SDG&E’s TOU schedules were modified to adopt the rate structure changes proposed for the utilities’ default residential tariffs?

A. 7,500 SCE NEM customers and 1,700 SDG&E NEM customers currently take service under TOU rate schedules and would be affected by the proposed structural changes.55 SCE and SDG&E did not provide NEM bill impact analyses specific to the TOU rate schedules. It is likely that low-usage customers would be most negatively affected, due to the addition of the fixed customer charge. Maintaining the existing TOU rate options for these customers would provide them an opportunity to recoup their solar PV investments while also allowing customers the option to switch to the utilities’ proposed new optional TOU tariffs.

55 Responses of SCE and SDG&E to Vote Solar Data Request 4, Question 1b(i) (see Attachments B and C).
Q. Do you propose that current NEM customers be allowed to remain indefinitely on current TOU rate schedules with current rate structures?

A. No. The Commission developed a transition framework for NEM customers in the NEM Grandfathering Decision that “balances the interests of participating and non-participating customers by gradually shifting customers to the successor tariff after they have received a reasonable return on their systems, or upon their request.”\(^{56}\) I recommend that the Commission apply the provisions of the transition framework in the NEM Grandfathering Decision to my proposal to grandfather NEM customers’ TOU rate design structures. In particular, the NEM Grandfathering Decision established a transition period of 20 years from the year of interconnection during which NEM customers may remain on their current NEM tariff.\(^{57}\) It established that customers who opt to switch to the successor NEM tariff before the end of their transition period may not later move back to their previously applicable NEM tariff.\(^{58}\) It also extended the transition period offer both to current NEM customers and to customers who apply to take service under a NEM tariff by July 1, 2017, or the date on which a utility reaches its NEM transition trigger level, whichever is earlier.\(^{59}\)

\(^{57}\) D.14-03-041 in R.12-11-005, p. 2.
\(^{58}\) D.14-03-041 in R.12-11-005, p. 23.
Q. Why is this a reasonable approach?
A. Maintaining the same transition provisions for both the grandfathering of the NEM tariff and NEM customers’ TOU tariffs provides for administrative simplicity because the end of a customers’ NEM tariff transition period will be the same as the end of that customers’ TOU tariff transition period. It is also logically sound because the aims of the transition period are the same in both cases (i.e., to provide NEM customers with a fair opportunity to recoup the cost of their solar PV systems).

Q. Now that the Commission has already established a transition period for NEM tariffs, is a transition period for TOU tariffs also needed?
A. Absolutely. The aims of the NEM transition period will not likely be achieved unless the transition period applies to both the NEM tariff and the TOU tariff because significant changes to either rate schedule can undermine the economics of solar investments. In other words, as SDCPA testified in SDG&E’s GRC proceeding, the decision to invest in solar is based not only on the provisions of the NEM tariff, but also on the provisions of the standard tariff to which the NEM tariff is coupled. The two tariffs together determine the economics of the solar investment so NEM customers must retain access to both these tariffs in their current forms in order to have a fair chance to recoup the cost of their investments.

60 D.14-01-002 in A.11-10-002, p. 31.
ii) PG&E’s Schedules E-7 and E-8 Rate Differentials Compared to the Default Tariff Should be Preserved

Q. Would increasing the rates under PG&E’s Schedules E-7 and E-8 be considered a structural rate change in this circumstance?

A. Yes. PG&E’s Schedules E-7 and E-8 have been closed to new customers since January 2008 and January 2003, respectively. NEM customers that are on these rate schedules are therefore primarily early adopters that invested in NEM systems prior to 2008 when the systems were much more expensive than today. Without the discounted rate levels that are provided in these tariffs, it is likely that many of these investments would not have been economically justifiable and would not have been made. These early adopters did not benefit from the steep reductions in the cost of solar power of recent years and many will likely not be able to recoup the costs of their PV investments if they face rate increases to bring their rate levels in-line with the default tariff.

Q. To what extent are customers who installed residential PV prior to 2008 early adopters?

A. Customers who installed PV systems prior to 2008 can be considered early adopters because they were installing their systems prior to (1) the boom in solar installation rates and (2) the rapid decline in solar PV prices. Prior to

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2008, fewer than 15,000 residential PV systems were being installed each year nationwide (see Figure 1). By 2009, that rate more than doubled, and in 2013, over 140,000 residential PV systems were installed, about 10 times as many systems as were installed in 2007. Those who installed solar prior to 2008 were engaged in a much smaller solar marketplace than exists today.

Figure 1: Number of Annual U.S. Grid-Connected Photovoltaic Installations, 2003-2012

These customers were also buying systems with higher unit costs (see Figure 2). From 2005-2007, residential and commercial photovoltaic systems up to 10 kW cost about $9 per Watt$_{DC}$. Beginning in 2008, prices began to decline significantly on an annual basis, down to about $5 per Watt$_{DC}$ in 2012, with

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65 Sherwood 2013, p. 5 (see Attachment I).
66 Sherwood 2013, p. 5 (see Attachment I).
preliminary data indicating even lower prices in 2013. Customers that installed solar PV systems prior to 2008 likely paid close to double or more than they would have paid for the same size system today.

Figure 2: Installed Cost of Residential and Commercial Solar Photovoltaic Systems, 1998-2012

Q. Why should the Commission protect early adopters’ investments if they were uneconomic without discounted rates?

A. The early adopters were responding to the policy signals and rate differentials provided by the Commission and the State in making their decisions to invest significant sums of money in a technology that was expensive and not widely used. These investments must be protected in order not to discourage future customer investments in new grid-supportive technologies by adding the risk of regulatory uncertainty to already-risky investments.

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68 Tracking the Sun VI, pp. 13-14 (see Attachment K).
69 Prices in 2012 dollars. Tracking the Sun VI, p. 13 (see Attachment K).
Moreover, early adopters should not be penalized because solar prices have fallen. Early adopters willing to take on the risk and high cost of a new technology provide a testing ground for the product that, if successful, opens up the product to mainstream consumers with lower risk tolerances. In other words, it was early adopters’ investments that, in part, paved the way for the significant growth in the solar market and the associated price reductions that have been seen in recent years.

Q. What would be the bill impact for E-7 and E-8 NEM customers if the current rate discounts were removed?

A. PG&E’s NEM bill impact analysis shows a bill increase of 55 percent for the median-usage Schedule E-7 NEM customer as a result of PG&E’s proposal to eliminate the rate differential that is part of the current tariff, with 65% of customers facing increases of more than 20 percent and increases for most customers ranging from a low of 10 percent to more than 100 percent. These bill increases would affect more than 12,000 PG&E NEM customers (see Table 4).

70 PG&E Additional Supplemental Testimony, pp. 7 and 43. Calculated 55% by removing the 2.1% revenue requirement increase from the 58.1% increase for customers with 350-400 kWh of usage (55% = 1.581/1.021-1).
71 PG&E Additional Supplemental Testimony, p. 2.
PG&E’s NEM bill impact analysis shows more moderate increases (mostly in
the range of 10 percent to 20 percent) for Schedule E-8 NEM customers.\textsuperscript{72} Fewer than 1,000 PG&E NEM customers take service under Schedule E-8.

**Q.** Has the Commission previously found it appropriate to maintain the E-7
and E-8 rate differentials?

**A.** Yes. In D.06-12-025, the Commission reversed a previous decision to
eliminate Schedule E-7 and provided for (1) a limited reopening of Schedule
E-7 for new solar customers and (2) continued access to the rate schedule for
customers already enrolled and for customers that would enroll prior to the
adoption of new TOU rates in PG&E’s then-pending GRC.\textsuperscript{73} The Commission
maintained the discounted Schedule E-7 rates for these categories of
customers in order to support the development of solar projects in
California.\textsuperscript{74} Similarly, when the Commission suspended the availability of
Schedule E-8 to new customers in D.01-05-064, the Commission left
Schedule E-8 open to customers already taking service under that rate
schedule with the existing rate differentials unchanged.\textsuperscript{75}

\textsuperscript{72} PG&E Additional Supplemental Testimony, p. 45.
\textsuperscript{73} D.06-12-025 in A.04-06-024, December 14, 2006, p. 3.
\textsuperscript{74} D.06-12-025 in A.04-06-024, December 14, 2006, Finding of Fact 1, p. 4.
\textsuperscript{75} D.01-05-064 in A.00-11-038, May 15, 2001, pp. 37-38.
Q. Is maintaining the E-7 and E-8 rate differentials for NEM customers consistent with the Commission’s rate design principles?

A. Yes. Principle 7 states: “Rates should generally avoid cross-subsidies, unless the cross-subsidies appropriately support explicit state policy goals.”76 As discussed above, to support future customer investments in preferred resources, the Commission must provide the regulatory certainty that customers will continue to have access to the rate structures upon which they base their long-term investment decisions for enough time to have a fair chance at recovering their investment costs. Protecting early-adopting NEM customers’ investments in PV by keeping in place existing rate differentials is a low-cost way to support customer investments to meet future state policy goals.

Q. What is the near-term cost of maintaining the Schedule E-7 differentials for current NEM customers?

A. I have estimated the near-term annual costs of the Schedule E-7 rate differential to NEM customers at less than $2.6 million per year based on the difference in the average NEM rate for Schedule E-7 customers and the average NEM rate for Schedule E-6 customers applied to the net electricity usage of NEM customers on Schedule E-7 in 2011 (see Table 6).77

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77 PG&E Additional Supplemental Testimony, p. 2.
Table 6: Reduction to E-7 NEM Bills under E-7 Rates compared with E-6 Rates\(^{78}\)

<table>
<thead>
<tr>
<th>NEM MWh</th>
<th>Average Rate for NEM Customers, ¢/kWh</th>
<th>Annual Bill, $ Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>E-7</td>
</tr>
<tr>
<td>E-7</td>
<td>73,770</td>
<td>14.3</td>
</tr>
<tr>
<td>E-7L</td>
<td>2,343</td>
<td>9.7</td>
</tr>
<tr>
<td>E-7 Total</td>
<td>76,113</td>
<td>14.2</td>
</tr>
</tbody>
</table>

Q. Why did you compare Schedule E-7 to Schedule E-6 in developing your comparison?

A. Schedule E-6 is designed to be revenue neutral with Schedule E-1. The difference between the average Schedule E-6 rate and the average Schedule E-1 rate is therefore due to differences in the load shapes of customers on these rate schedules. Since Schedules E-6 and E-7 are both TOU tariffs and Schedule E-1 is not, the Schedule E-7 load shapes are likely to be more similar to the Schedule E-6 load shapes than the Schedule E-1 load shapes, and the average Schedule E-6 rates are therefore more applicable rate comparisons for Schedule E-7 customers than the average Schedule E-1 rates.

Q. What is the near-term cost of maintaining the E-8 rate differentials for current NEM customers?

A. PG&E’s NEM bill impact report shows the average Schedule E-8 rate as higher than the average Schedule E-6 rate and lower than the average Schedule E-1 rate. Conservatively using the Schedule E-1 rate as the basis for

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\(^{78}\) PG&E Additional Supplemental Testimony, p. 2.
comparison yields a near-term annual cost of the Schedule E-8 rate
differential to NEM customers of $0.22 million (see Table 7).

Table 7: Reduction to E-8 NEM Bills under E-8 Rates compared with E-1 Rates

<table>
<thead>
<tr>
<th>NEM MWh</th>
<th>Average Rate for NEM Customers, ¢/kWh</th>
<th>Annual Bill, $ Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011 E-8</td>
<td>E-1</td>
</tr>
<tr>
<td>E-8</td>
<td>9,626</td>
<td>18.8</td>
</tr>
<tr>
<td>E-8L</td>
<td>505</td>
<td>10.7</td>
</tr>
<tr>
<td>E-8 Total</td>
<td>10,131</td>
<td>18.4</td>
</tr>
</tbody>
</table>

Q. Why did you compare Schedule E-8 to Schedule E-1 in developing your comparison?

A. Schedule E-8 is a seasonal rate schedule, which is a very basic form of a TOU rate schedule. However, Schedule E-8 does not have different TOU periods within each season. Thus, I assumed that Schedule E-8 customers’ load shapes are more similar to load shapes for Schedule E-1 customers than to Schedule E-6 customers.

Q. What is the total near-term and long-run cost of keeping Schedules E-7 and E-8 open to NEM customers and to maintain the existing rate differentials?

A. The total near-term cost for keeping Schedules E-7 and E-8 open to NEM customers with the existing rate differentials is about $2.8 million per

79 PG&E Additional Supplemental Testimony, p. 2.
In the long-run, the cost of the rate differentials will decline over time as customers leave these rate schedules at -- or prior to -- the end of their 20-year transition periods since Schedules E-7 and E-8 will remain closed to new customers under Vote Solar’s proposal. Assuming conservatively that (1) the transition period for all NEM customers currently on these rate schedules ends 20 years following the date these tariffs were closed to new customers and (2) that all NEM customers currently on these tariffs remain on these tariffs until their transition periods end, I estimate a total cost of the rate differentials through the transition period of about $35 million (see Table 8).

<table>
<thead>
<tr>
<th>Year</th>
<th>E-7</th>
<th>E-8</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>$2.6</td>
<td>$0.2</td>
<td>$2.8</td>
</tr>
<tr>
<td>2027</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2027</td>
<td></td>
<td></td>
<td>$33.6</td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td>$1.7</td>
<td>$35.4</td>
</tr>
</tbody>
</table>

Q. What are your conclusions with regard to the Schedule E-7 and E-8 rate differentials?

A. The Schedule E-7 and E-8 rate differentials relative to the default tariff should be maintained for current customers for the same reasons that current

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$^{80}$ $2.8$ million = $2.59$ million for E-7 + $0.22$ million for E-8.

$^{81}$ Calculated as twenty years after the last date that the tariffs were open to new customers in December 2007 for Schedule E-7 and December 2002 for Schedule E-8.

$^{82}$ Calculated by multiplying the Annual Cost based on 2011 Usage by the Years in Transition Period.
Schedule E-6 customers should be allowed to keep taking service under the existing Schedule E-6 rate structure. It is both a matter of fairness to the customer and a matter of good policy to not take action to harm investments that were encouraged by the Commission. Ending the rate differentials for Schedules E-7 and E-8 could weaken the Commission’s ability to incentivize customers to make significant investments in grid-supporting technologies in the future. PG&E’s proposal to eliminate the rate differentials is inconsistent with the Commission’s rate design principal of appropriately considering and minimizing bill impacts, is unfair to the solar early-adopters that are taking service under these rate schedules whose investments paved the way for the significant price reductions seen in more recent years, and provides negligible direct cost-savings to other customers. PG&E’s proposal should therefore be denied.

Q. Are these conclusions specific to Schedules E-7 and E-8?

A. No. If the rate levels of any of the other TOU tariffs are lower than in the utility’s default residential tariff, these tariffs should also be maintained with the current rate differential in place for NEM customers already taking service under the tariffs. This is needed to protect NEM customers’ investments, as discussed for Schedules E-7 and E-8. These two schedules were called out only because of PG&E’s proposal to eliminate their rate differentials; the same principles apply to all the TOU tariffs.
Q. Does this conclude your opening testimony?

A. Yes.