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Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs Pursuant to Public Utilities Code Section 2827.1, and to Address Other Issues Related to Net Energy Metering.	Rulemaking 14-07-002 (Filed July 10, 2014)

PROPOSAL OF THE OFFICE OF RATEPAYER ADVOCATES FOR NET ENERGY METERING SUCCESSOR STANDARD CONTRACT OR TARIFF

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August 3, 2015

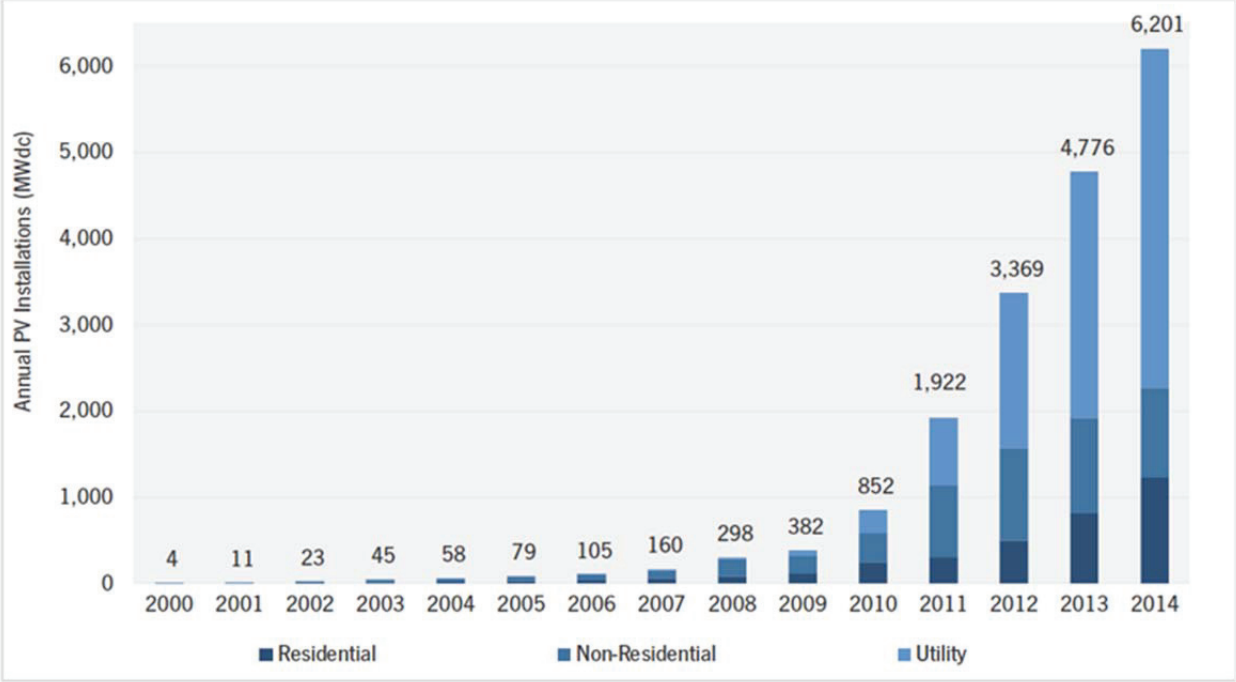
I. INTRODUCTION

Pursuant to the Assigned Commissioner's Ruling Granting In Part Motion of the Alliance for Solar Choice and Revising Procedural Schedule,[1] the Office of Ratepayer Advocates (ORA) is pleased to submit this proposal for the successor to the Net Energy Metering (NEM) tariff. The existing NEM tariff was originally established in California in 1995 with the adoption of Senate Bill 656 (Alquist, Stats. 1995, ch. 369) and codified in § 2827 of the Public Utilities Code.[2] Since then, the NEM tariff has remained largely unchanged. But in these same twenty years, the solar photovoltaic (PV) industry has experienced phenomenal growth (see Figure 1). Also, in these twenty years, the cost of solar PV has dropped dramatically (see Figure 2). The Solar Energy Industries Association (SEIA) reports that since 2006, the cost to install solar has dropped by more than 73% and since 2010 residential solar costs have dropped by 45%. Unfortunately, these steady solar PV cost decreases have not translated to lower NEM costs for ratepayers. This is one of the fundamental problems with the current California NEM tariff. Specifically, solar PV cost decreases are not passed on to California ratepayers through lower NEM program costs. This problem is in contrast to the declining costs for solar resources procured by the utilities on behalf of ratepayers through competitive mechanisms, which are passed on to ratepayers through lower power purchase agreement prices.

[1] Assigned Commissioner's Ruling Granting In Part Motion of the Alliance For Solar Choice and Revising Procedural Schedule, June 23, 2015, p. 2.

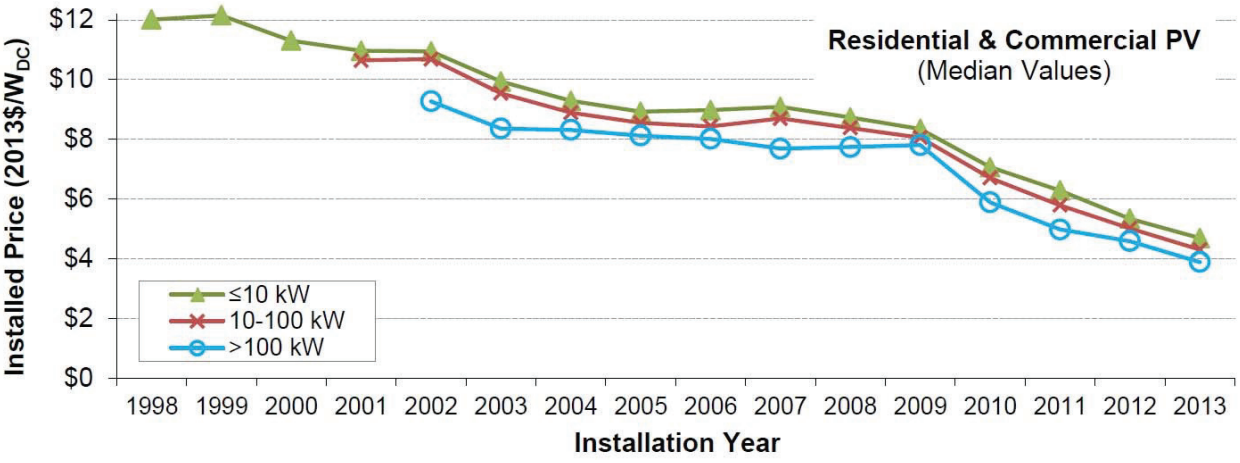
[2] Rulemaking 14-07-002 Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs Pursuant to Public Utilities Code Section 2827.1, and to Address Other Issues Related to Net Energy Metering, July, 17, 2014, p. 1.

Figure 1: Annual United States Solar PV Installations, 2000-2014



Source: Solar Energy Industries Association (SEIA) Solar Market Insight Report 2014 Q4

Figure 2: Installed Price of Residential & Commercial PV Has Steadily Declined Since 1998

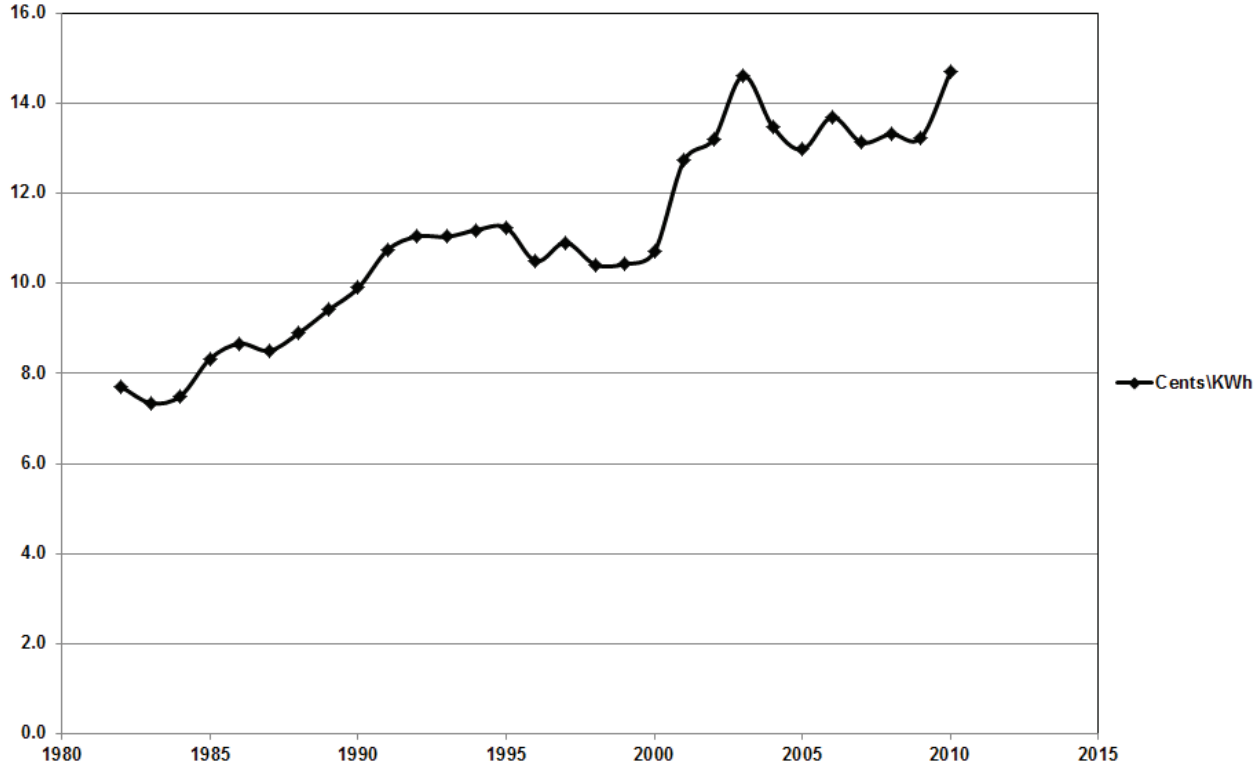


Source: Lawrence Berkeley National Laboratory/DOE Sunshot, *Tracking the Sun VII*, September 2014

A second flaw with the existing NEM tariff is that the solar customer's underlying electricity rate, not solar costs, drives NEM program costs for ratepayers. Retail rates in California are on the rise, and are likely to continue in the future (see Figure 3).

Currently, as retail rates increase, NEM compensation increases, which is a perverse incentive for a declining cost resource. The existing NEM tariff is a mechanism that doesn't account for the explosive growth of solar, the declining costs of solar, the rising California retail rates, and the need for solar customers to share in the costs of the distribution system. Assembly Bill (AB) 327 (2013 Perea) recognized the importance of resolving this problem with two inter-related tasks: 1) reforming residential rates and 2) designing a new NEM tariff. The first step, residential rate reform, has been completed with the Commission approval of Decision 15-07-001.[3] Now it is time to complete the second task set out by AB 327, which is to design a NEM successor tariff.

Figure 3: California Average Retail Electricity Prices Continue to Rise



Source: California Energy Commission (CEC), California Electricity Statistics & Data Website

[3] Decision 15-07-001, Decision on Residential Rate Reform for Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company and Transition to Time-of-Use Rates; July 13, 2015.

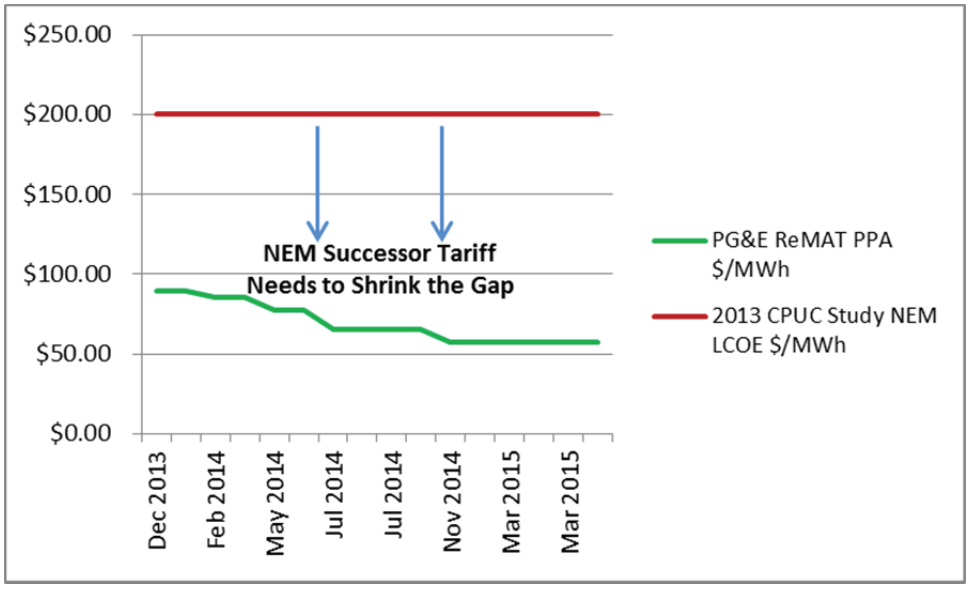
Ideally, NEM successor program costs should reflect, for the benefit of ratepayers, solar cost declines achieved over time. This is how it works with competitively-procured solar resources. California is a very experienced buyer of solar PV in systems of all sizes. California buys large-scale solar through the renewable portfolio standard (RPS) program, medium-scale solar through the Renewable Auction Mechanism (RAM), and small-scale solar (similar in scale to NEM) through the Investor Owned Utility (IOU) Solar PV Programs, Feed-in Tariffs, and the Renewable Market Adjusting Tariff (ReMAT). Through each of these competitive procurement mechanisms, California ratepayers benefit from steady price decreases that reflect the declining cost of solar. The NEM successor tariff should also reflect the declining cost of solar.

There is a wide disparity between the cost to ratepayers of residential NEM solar in juxtaposition to comparable-sized competitively-procured solar. Figure 4 shows this distortion in cost to ratepayers between NEM and ReMAT. The Commission's 2013 Cost of NEM study[4] estimates the levelized cost to ratepayers of NEM to be $200 per Megawatt hour (MWh). This is stark contrast to comparable-sized ReMAT program projects built and underway which are less than $100 per MWh.[5]

[4] http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm

[5] The ReMAT prices are from PG&E's July 2, 2015 ReMAT report in compliance with PUC Section 399.20(m). http://www.pge.com/en/b2b/energysupply/wholesaleelectricsuppliersolicitation/ReMAT/index.page scroll down to "10-Day Reporting Requirement"

Figure 4: NEM Resource Costs are Double that of Small-Scale Competitively-Procured Solar



Though energy prices for residential solar may not completely converge with competitively-procured small-scale solar, the NEM successor tariff needs to reduce this gap. In a sustainable market, ratepayers would be indifferent to funding competitively-procured solar or NEM solar since both types of resources should have comparable costs. But the current situation is not sustainable where NEM solar cost is double that of similar-sized competitively-procured solar. The NEM successor tariff needs to address this discrepancy.

ORA's proposal is designed to advance a sustainable solar market within the state of California while gradually reducing the subsidy that is currently embedded in the existing NEM tariff. Reducing the embedded subsidy associated with the existing NEM tariff is necessary in order to accomplish the statutory requirement of Public Utilities Code Section 2827.1(b)(4)[6] of ensuring that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the

[6] § 2827.1(b)(4) – "Ensure that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs."

total costs. ORA's proposal for the NEM successor tariff is designed to accomplish this goal and others and is attached to this pleading as Attachment 1.

Respectfully submitted,

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August 3, 2015

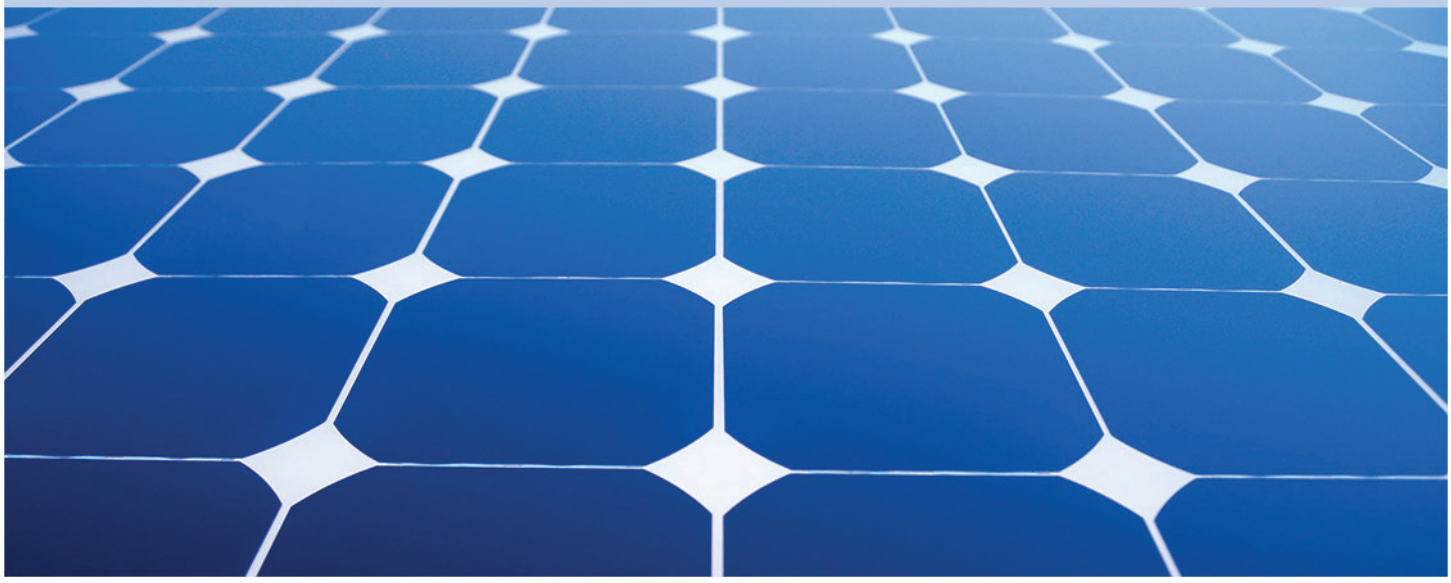
Attachment 1

The Office of Ratepayer Advocates (ORA) Proposal for Successor Tariff for California's Net Energy Metering Program

ORA
OFFICE OF RATEPAYER ADVOCATES

August 3, 2015

Proposal for Successor Tariff
California's Net Energy Metering



ABOUT ORA

THE OFFICE OF RATEPAYER ADVOCATES (ORA) IS THE INDEPENDENT CONSUMER ADVOCATE WITHIN THE CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) THAT ADVOCATES SOLELY ON BEHALF OF INVESTOR OWNED UTILITY RATEPAYERS. ORA'S STATUTORY MISSION IS TO OBTAIN THE LOWEST POSSIBLE RATE FOR SERVICE CONSISTENT WITH RELIABLE AND SAFE SERVICE LEVELS. IN FULFILLING THIS GOAL, ORA ALSO ADVOCATES FOR CUSTOMER AND ENVIRONMENTAL PROTECTIONS.

Proposal for Successor Tariff

California's Net Energy Metering

Written by
Tim Drew
Dave Peck
Xian Ming "Cindy" Li
Garima Vashishtha

August 2015

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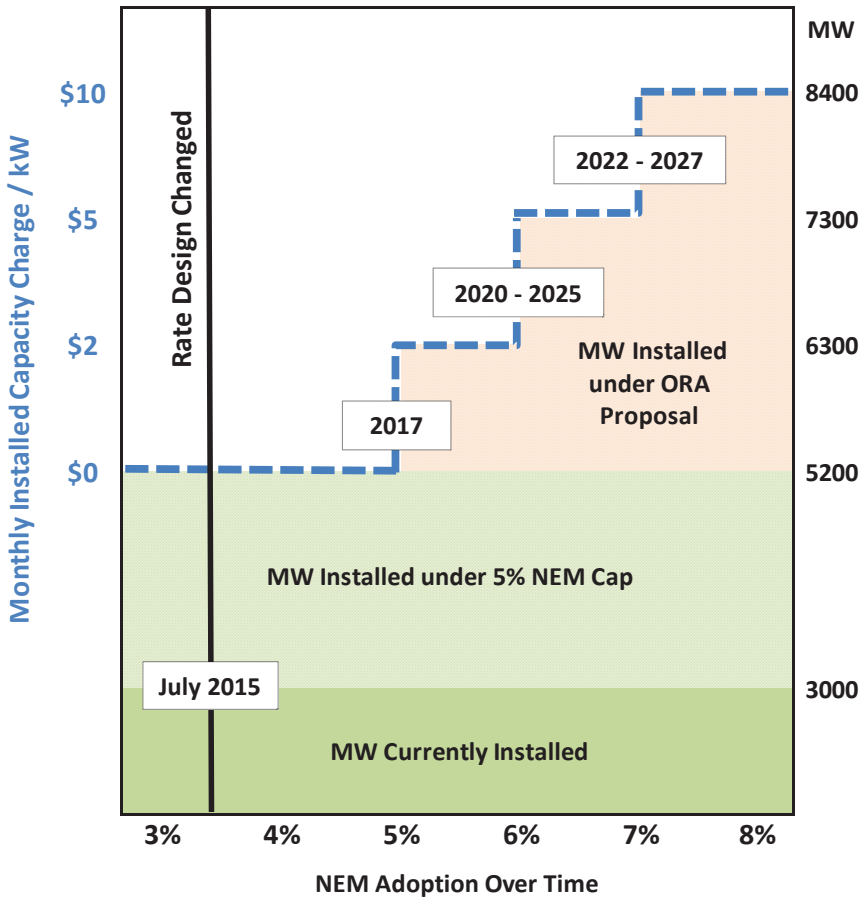
1. Successor Tariff Summary

a. What is the Office of Ratepayer Advocates Proposing?

The Office of ratepayer Advocates (ORA) is proposing a successor tariff for residential utility customers that is a continuation of the existing NEM (at full retail rate) tariff, but with an additional fee to be levied on customer generators who interconnect after a utility reaches the 5% NEM cap for its territory or July 1, 2017, whichever comes first. ORA's proposed fee, referred to throughout ORA's attached proposal as an **Installed Capacity Fee** or **ICF**, is based on the installed capacity of the generator. The utilities will credit the ICF revenues directly to residential electricity customers in rates. To maintain market certainty, ORA proposes to introduce the ICF gradually with a **three step glide-path**. Each subsequent ICF step change is triggered as NEM adoption milestones are reached, as illustrated in Figure 1. By tying ICF increases to NEM adoption milestones, ORA's proposal ensures that increasing fees do not outpace the rate of adoption and that the tariff adjusts to actual adoption, rather than theoretical adoption.

Figure 1: Illustration of the ORA Installed Capacity Fee for Residential Customers



- The **first step** will be a fee of **$2/kW/Month** that will begin implementation when a utility surpasses **5%** of its aggregate customer peak demand, or July 1, 2017, whichever comes first.[1]
- The **second step** will be a fee of **$5/kW/Month** that will begin implementation when the proportion of existing NEM and successor tariff interconnected capacity surpasses **6%** of a utility's aggregate customer peak demand.
- The **third step** will be a fee of **$10/kW/Month** that will begin implementation when the proportion of existing NEM and successor tariff interconnected capacity surpasses **7%** of a utility's aggregate customer peak demand.

[1] ORA proposes that the proportion of aggregate peak demand continue to be calculated as described in D. 14-03-041.

To ensure a predictable payback period, customers who take the successor tariff will be grandfathered at that ICF level for a 10 year period, after which the customer will transition to the ICF that is applicable at that time.

ORA proposes to allow participation of projects greater than 1 MW in NEM by applying the same successor tariff requirements of the ICF as described above, provided the system is sized to not exceed available onsite load and demonstrates compliance with the Rule 21 Fast Track process. ORA proposes to discontinue all existing NEM fee waivers and NEM exemptions for projects greater than 1 MW.

ORA's proposal for an installed capacity fee would also apply to Virtual Net Metering and NEM Aggregation participants.

b. Is ORA using the Bookend Cases or Both the Bookend Cases And a Third Case?

ORA is submitting public tool results using all of the baseline scenarios prescribed by the July 20, 2015 ALJ ruling in R.14-07-002.[2] The ALJ ruling requires parties to submit public tool results using six baseline scenarios, specifically both low and high DG value assumptions for a 2-tiered rate design and two time-of-use (TOU) rate designs. ORA ran these six scenarios for each of the ICF values proposed by ORA as well as a "bookend" ICF value that ORA calculated would approximately cover the entire cost shift estimated by the Cost of Service functionality in the public tool. ORA also ran the public tool scenario representing existing conditions, i.e. a 4-tiered rate design with the existing NEM, to use as an additional baseline comparison.

c. How Does the Proposal Meet the Relevant Statutory Criteria?

ORA used the public tool as the analytical platform to evaluate whether the ORA proposal meets the statutory criteria in Public Utilities Code (PU Code) §§ 2827.1(b)(1)[3], 2827.1(b)(3)[4],

[2] ADMINISTRATIVE LAW JUDGE'S RULING PROVIDING FURTHER INSTRUCTIONS FOR PARTIES' PROPOSALS AND ACCEPTING INTO THE RECORD CERTAIN UPDATES TO THE PUBLIC TOOL. July 20, 2015.

[3] Section 2827.1(b)(1) – "Ensure that the standard contract or tariff made available to eligible customer-generators ensures that customer-sited renewable distributed generation continues to grow sustainably and include specific alternatives designed for growth among residential customers in disadvantaged communities".

[4] Section 2827.1(b)(3) – "Ensure that the standard contract or tariff made available to eligible customer-generators is based on the costs and benefits of the renewable electrical generation facility".

and 2827.1(b)(4).[5] ORA's proposal balances the legislative intent to ensure that customer-sited renewable distributed generation continues to grow sustainably and remains a viable customer option, and that total benefits are approximately equal to the total costs, and that market certainty is maintained. As such, ORA's proposal gradually reduces the subsidy embedded in the existing NEM tariff.

d. What Statutory, Policy, and Practical Issues Remain Open in the Proposal?

Each utility will be required to file an advice letter which will include the details of implementing ORA's proposal and developing detailed tariff sheets.

Each utility will be required to file an advice letter seeking approval of its proposal for crediting the ICF revenues directly to residential electricity customers in rates.

Each utility will be required to file an advice letter seeking approval of its proposal for calculating and levying a one-time interconnection fee and discontinuing existing NEM fee waivers and NEM exemptions for customers who interconnect systems greater than 1 MW in size.

Each utility will be required to file an advice letter which will include the details of implementing ORA's proposed consumer protection measures.

2. Introduction

The Office of Ratepayer Advocates (ORA) is pleased to submit this proposal for a successor to the existing Net Energy Metering tariff. ORA's proposal is designed to advance a sustainable solar market within the state of California while also gradually reducing the subsidy that is currently embedded in the existing NEM tariff structure. Reducing the embedded subsidy associated with the existing NEM tariff is necessary in order to accomplish the statutory requirement of PU Code § 2827.1(b)(4) of ensuring that the total benefits of the standard

[5] Section 2827.1(b)(4) – "Ensure that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs".

contract or tariff to all customers and the electrical system are approximately equal to the total costs.

The following is a description of ORA's proposal for a successor to the existing Net Energy Metering (NEM) tariff for residential utility customers. In addition to developing a proposal that satisfies the statutory criteria in PU Code §§ 2827.1(b)(1), 2827.1(b)(3), and 2827.1(b)(4), ORA's proposal also balances the following additional goals as much as possible:

- Fair treatment to non-participants
- Fair compensation to customer generators
- Simple for customers to understand
- Regulatory certainty for the market
- Maintain customer choice
- Achieve State distributed solar goals

ORA supports customer-sited renewable energy as a key part of the future utility system. However, the Commission should put a mechanism in place that reduces the cost burden on non-participating customers for purchases from NEM systems over time.

Using the CPUC's "public tool"[6] ORA has determined that the current NEM program embedded subsidy, or cost shift, cannot be immediately and entirely eliminated without impacting sustainable growth of the renewable distributed generation market. Therefore, ORA proposes a successor tariff program that reduces the embedded subsidy in increments over time.

Distributed solar has been supported by the multi-year California Solar Initiative (CSI)[7] rebate program and continues to benefit from the Investment Tax Credit (ITC).[8] The CSI program is considered a success and is credited with propelling customer adoption of solar.[9] While CSI

[6] http://www.cpuc.ca.gov/PUC/energy/DistGen/NEMWorkShop04232014.htm. June 17, 2015 version.
[7] www.gosolarcalifornia.com
[8] The Solar Energy Industries Association has created an informative webpage on the Solar Investment Tax Credit at http://www.seia.org/policy/finance-tax/solar-investment-tax-credit
[9] See CPUC June 2015 press release on the CSI Program http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M152/K996/152996638.PDF

rebates have been incrementally reduced over the life of the program[10] and the program is currently closed to new applications, customer-generator solar adoption continues rapid growth in the residential sector largely due to the ITC, technical and financing innovations in the solar market,[11] and the existing Net Energy Metering tariff.[12] ORA's proposal replicates the concept of declining incentives based on achievement of solar adoption milestones. This concept was implemented by the CSI program and has been shown to work well to grow the solar market while reducing subsidies over time. The Legislature clearly intended to reduce embedded subsidies flowing to solar adopters with the passage of Assembly Bill (AB) 327.[13] In order to sustain the solar market in California at this critical juncture, and also implement a successor tariff that reduces the subsidy embedded in the existing NEM structure, ORA proposes to introduce an Installed Capacity Fee (ICF), that is based on the rated capacity of the on-site renewable generator, and gradually increased as California solar adoption milestones are achieved. By tying ICF increases to NEM adoption milestones, ORA's proposal ensures that increasing fees do not outpace the rate of adoption and that the tariff adjusts to actual adoption, rather than theoretical adoption.

3. The Problems with the Existing NEM Tariff Need to be Addressed

The current NEM tariff was originally established in California in 1995 with the adoption of Senate Bill 656 (Alquist, Stats. 1995, ch. 369) and codified in § 2827 of the PU Code.[14] Since then, the NEM tariff has remained largely unchanged. Though in these twenty years, the cost of solar PV has dropped dramatically (see Figure 2). The Solar Energy Industries Association

[10] CSI rebates were reduced from $2.50/watt to $0.20/watt for residential and commercial customers over the life of the program. http://www.csi-trigger.com/

[11] See CPUC June 2015 press release on the CSI Program

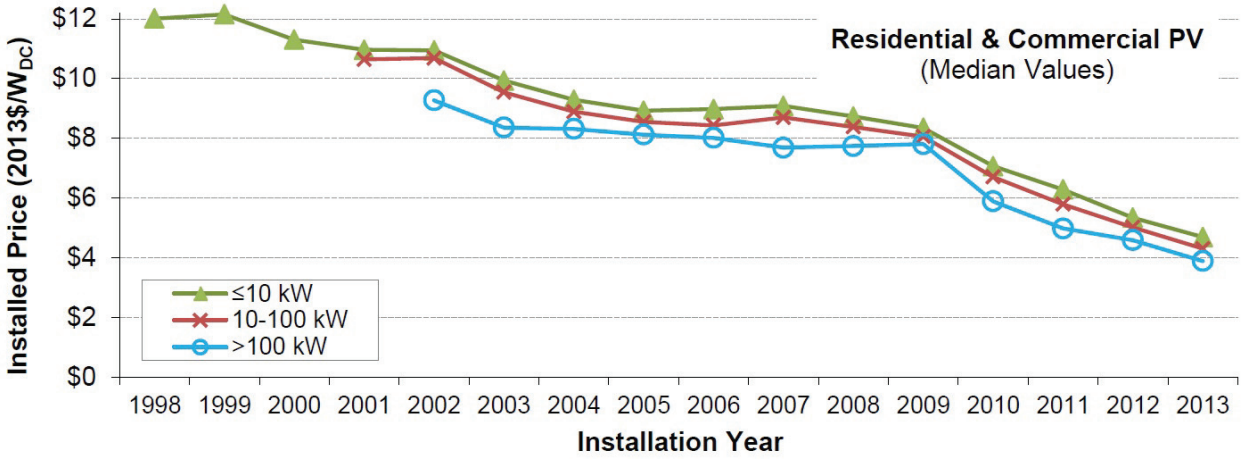
[12] California Public Utilities Commission, California Solar Initiative Annual Program Assessment, June 2014, p.8, http://www.cpuc.ca.gov/NR/rdonlyres/9FBE11AB-1120-4BE1-8C66-8C239E36A641/0/CASolarInitiativeThermalProgramJune2014_070114.pdf

[13] Assembly Floor Analysis prepared by Susan Kateley, September 11, 2013; Assembly Bill 327 as Amended In Senate September 06, 2013. Available at leginfo.legislature.ca.gov.

[14] Rulemaking 14-07-002 Order Instituting Rulemaking to Develop a Successor to Existing Net Energy Metering Tariffs Pursuant to PU Code § 2827.1, and to Address Other Issues Related to Net Energy Metering, July, 17, 2014, p. 1.

(SEIA) reports that the cost to install solar has dropped by more than 73% since 2006 and that residential solar costs have dropped by 45% since 2010. Unfortunately, these solar PV cost decreases have not translated to lower NEM costs for ratepayers. This is one of the fundamental problems with the current California NEM tariff. Specifically, solar PV cost decreases are not passed on to California ratepayers through lower NEM program costs. This problem is in contrast to the declining costs for solar resources procured by the utilities on behalf of ratepayers through competitive mechanisms, which are passed on to ratepayers through lower power purchase agreement prices.

Figure 2: Installed Price of Residential & Commercial PV Has Steadily Declined Since 1998



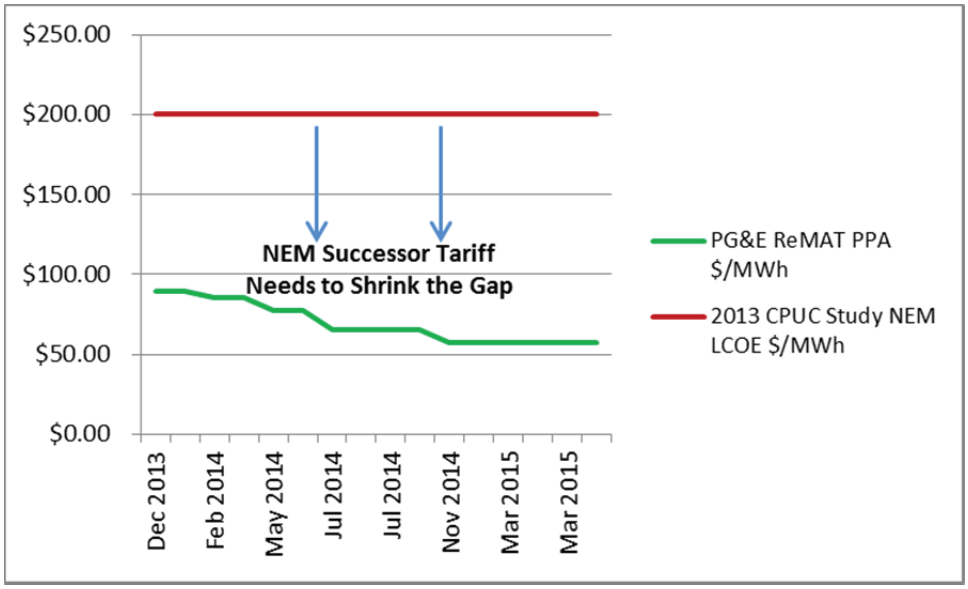
Source: Lawrence Berkeley National Laboratory/DOE Sunshot, *Tracking the Sun VII*, September 2014

There is currently a wide disparity between the cost to ratepayers for NEM compared to similar sized solar procured through competitive means. Figure 3 demonstrates this distortion in costs to ratepayers between NEM and California's feed-in tariff, the Renewable Market Adjusting Tariff (ReMAT). The Commission's 2013 Net Energy Meter Cost Benefit study[15] estimates the levelized cost to ratepayers of NEM to be $200 per Megawatt hour (MWh) when considering all generation. This is in stark contrast to comparable sized ReMAT program projects, built and underway, that are well below $100 per MWh.[16]

[15] http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm

[16] The ReMAT prices are from PG&E's July 2, 2015 ReMAT report in compliance with PU Code § 399.20(m). http://www.pge.com/en/b2b/energysupply/wholesaleelectricsuppliersolicitation/ReMAT/index.page scroll down to "10-Day Reporting Requirement"

Figure 3: Small-Scale Wholesale Solar Cost Are Far Below the Costs for Similar NEM



California NEM is currently limited to solar resources no greater than 1 MW while ReMAT is limited to solar generators no greater than 3 MW, so there is not a complete overlap of system sizes between the two programs.[17] Because of this scale difference, NEM costs may not completely converge with comparable competitively procured solar resources, but the NEM successor tariff needs to close this gap. In a sustainable situation, ratepayers would be indifferent to funding competitively procured solar compared to NEM solar since both types of solar would have comparable costs. But the current situation is not sustainable where NEM program resources cost ratepayers double what similar-sized competitively procured solar costs.

a. Recent Solar Reports Confirm that NEM Resources are Too Costly

A 2015 study from the Massachusetts Institute of Technology titled *The Future of Solar Energy* (MIT Solar Study) discusses similar cost findings as ORA and reports that the levelized cost of energy (LCOE) for California residential solar is approximately double that of utility-scaled

[17] Section 2827.1(b)(5) of the PU Code conditionally allows projects greater than 1 MW under the NEM successor tariff so the size overlap between NEM and ReMAT projects will become even more comparable.

solar.[18] The MIT Solar Study also finds numerous issues with the residential solar market in general, including:

- NEM at Retail Rate + Distribution Grid Costs collected thru Volumetric Rates is problematic.[19]
- Utility-scale PV is Competitive (Estimated Cost ~ Reported prices). Residential PV is not.[20]
- If the objective of deployment support policies is to increase solar generation at least cost, favoring residential PV makes no sense.[21]
- Residential PV generation should not continue to be more heavily subsidized than utility-scale PV generation.[22]

Another recent peer-reviewed solar study by the Brattle Group also finds residential solar to be double the cost per kilowatt-hour of utility scale solar.[23] The mounting data that finds residential solar to be double the cost of competitively procured solar resources needs be factored into the NEM Successor Tariff in order to provide a more cost-effective and equitable result for ratepayers.

b. Public Tool Scenarios for Current NEM Under All Default Rate Scenarios Demonstrates Severe Cost-Shifting

Energy Division Staff has provided parties several Public Tool baseline scenarios, including Existing Rate-Design Policy, Future Two-Tier Rate Design, Time-of Use (TOU) 4-8PM, and TOU 2-

[18] *The Future of Solar Energy*, The Massachusetts Institute of Technology, May 2015, p. 118. https://mitei.mit.edu/futureofsolar

[19] *Id*., p. 220; "In broad terms, the economically obvious solution is to move away from the prevalent design of distribution network charges that recovers fixed distribution costs via volumetric (per-kWh) charges."

[20] *Id*., pp. 81-86; "A bottom-up estimate of cost for utility scale PV installations yields a result that is very close to the average reported price per peak watt, indicating active competition in that segment of the PV market. In the residential sector, by contrast, a large difference exists between contemporary reported prices and estimated costs."

[21] *Id*., p. 223.

[22] *Id*., pp. 225-226; "Residential PV generation should not continue to be more heavily subsidized than utility-scale PV generation. Eliminating this uneconomic disparity will require replacing per-kWh distribution charges with a system for recovering utilities' distribution costs that reflects network users' impacts on those costs."

[23] *Comparative Generation Costs of Utility-Scale and Residential-Scale PV in Xcel Energy Colorado's Service Area*, prepared for utility-scale solar provider, First Solar, by The Brattle Group, July 13, 2015. http://www.brattle.com/news-and-knowledge/news/study-by-brattle-economists-quantifies-the-benefits-of-utility-scale-solar-pv

8PM. In addition, each baseline scenario can be executed under a high Distributed Generation (DG) value case or a low DG value case. Each of these baseline scenarios produce results that demonstrate severe cost-shifting from NEM participants to non-participants.

Table 1 below, provides the Public Tool Ratepayer Impact Measure (RIM) Test and Cost of Service (COS) outputs for all of the ED Staff baseline scenarios. ORA, like ED Staff, relies on the RIM test to evaluate potential cost shifts that may be imposed on non-participants.[24] And also like ED Staff, ORA focuses on the "all-generation" RIM test to measure the total benefits and total costs as directed in PU Code § 2827.1(b)(4).[25] Below, Table 1 indicates, under all baseline rate designs, the non-participant RIM benefit/cost test results are all substantially less than 1. This indicates that the existing NEM tariff will increase prices for all customers under all rate design futures.[26] As these results violate § 2827(b)(4), which directs the Commission to ensure that "the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs," changes to the existing NEM tariff are necessary.

[24] Energy Division Staff Paper on the AB 327 Successor Tariff or Standard Contract (Staff NEM Successor Whitepaper), June 3, 2015, p. 1-10; "The Commission has a well-established history of using the RIM test to evaluate the costs and benefits of NEM."
http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M152/K410/152410786.PDF
[25] *Id*., p. 1-10.
[26] *Id*., p. 1-11.

Table 1: Current NEM Creates Cost-Shift to Non-Participating Customers Under All Baseline Rate Designs (RIM All Generation)

					Residential COSR	
Renewable DG Case	Default Residential Rate	Forecasted Installations 2017-2025 (MW)	Average Non-Participant Benefit/Cost Ratio	Ratepayer Impact/Bill Increase (% of Res. RR)	Without DER	With DER
Existing	4-Tiered	11,293	0.44	7%	120%	45%
High	2-Tiered	16,047	0.49	10%	120%	31%
Low	2-Tiered	11,985	0.25	15%	110%	29%
High	TOU1	14,707	0.47	11%	121%	39%
Low	TOU1	11,771	0.24	18%	112%	31%
High	TOU2	15,622	0.49	11%	121%	38%
Low	TOU2	12,098	0.25	17%	111%	29%

Table 1 also provides the Cost of Service (COS) analysis results for all of the ED Staff baseline scenarios. Again, ORA agrees with the ED Staff conclusion that a COS analysis provides a valuable perspective to the cost/benefit tests.[27] ORA's analysis employs both the RIM test cost/benefit analysis and the COS assessment as was performed by E3 for the ED Staff 2013 NEM Impact Evaluation.[28] As the Table 1 COS results indicate, under all baseline rate designs, NEM participants' COS contribution results are all less than 50%.[29] This indicates that under the existing NEM tariff and under all default rate design futures, NEM participants do not pay their fair share of utility costs. Both the RIM test results and COS results provide a strong indication that the current NEM tariff needs to be modified to comply with PU Code § 2827.1(b)(4).

[27] *Id*., pp. 1-12 - 1-13; "A COS analysis provides an indicator of whether DG customers are 'paying their fair share,' and can further inform the results of a RIM test by highlighting existing subsidies built into utility rate structures."
[28] Energy Division Staff Paper on California Net Energy Metering Ratepayer Impacts Evaluation (ED Staff 2013 NEM Report), October 28, 2013, p. 1-13; "At its most basic level, the attached study employs two separate ratepayer impact measures: A cost-benefit analysis of the NEM program using the traditional California Standard Practices Manual (SPM) Ratepayer Impact (RIM) test, which estimates the net benefits (or costs) of a demand-side resource or program from the perspective of non-participating customers, and a full cost of service assessment, which compares the utility cost of serving NEM customers with their actual bill payments."
[29] A COS value of 100% indicates that a customer pays their full share of utility costs.

4. Technical Description of ORA's Proposed Successor Tariff

a. Description of the Standard Successor Tariff

In order to reduce the cost-shift from residential NEM participants to residential non-participants resulting from the current NEM tariff and to comply with § 2827(b)(4), which directs the Commission to ensure that "the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs," ORA proposes to introduce an Installed Capacity Fee (ICF). Grid-tied solar customers use grid services that must be paid for. The ICF will address, over time, the current cost-shift from NEM participants to non-participants. Under ORA's proposal, the ICF will be gradually increased as California solar adoption milestones are achieved. Solar adoption will be measured using the same methodology currently used by the Commission to track solar penetration for the purposes of evaluating progress towards the current 5% NEM cap.[30] On July 1, 2017, or when the aggregate NEM generator peak capacity in each utility service area reaches the current NEM cap of 5% penetration, whichever occurs first, the utilities will begin collecting a fee of $2/kW/Month from all new residential customer generators. When a utility reaches 6% NEM penetration level, the ICF will be increased to $5/kW/Month. When a utility reaches 7% NEM penetration level, the ICF will be increased to $10/kW/Month. Figure 4 provides an illustration of the mechanics of ORA's proposal. ORA has performed a regression analysis to estimate when the utilities will reach the 5%, 6%, and 7% NEM penetration goals and Figure 5, below, shows the results of that analysis. ORA's complete regression analysis of estimated solar penetration triggers is discussed in section 9.b.

[30] As documented in D. 14-03-041. http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=89386131

Figure 4: Illustration of the ORA Installed Capacity Fee for Residential Customers

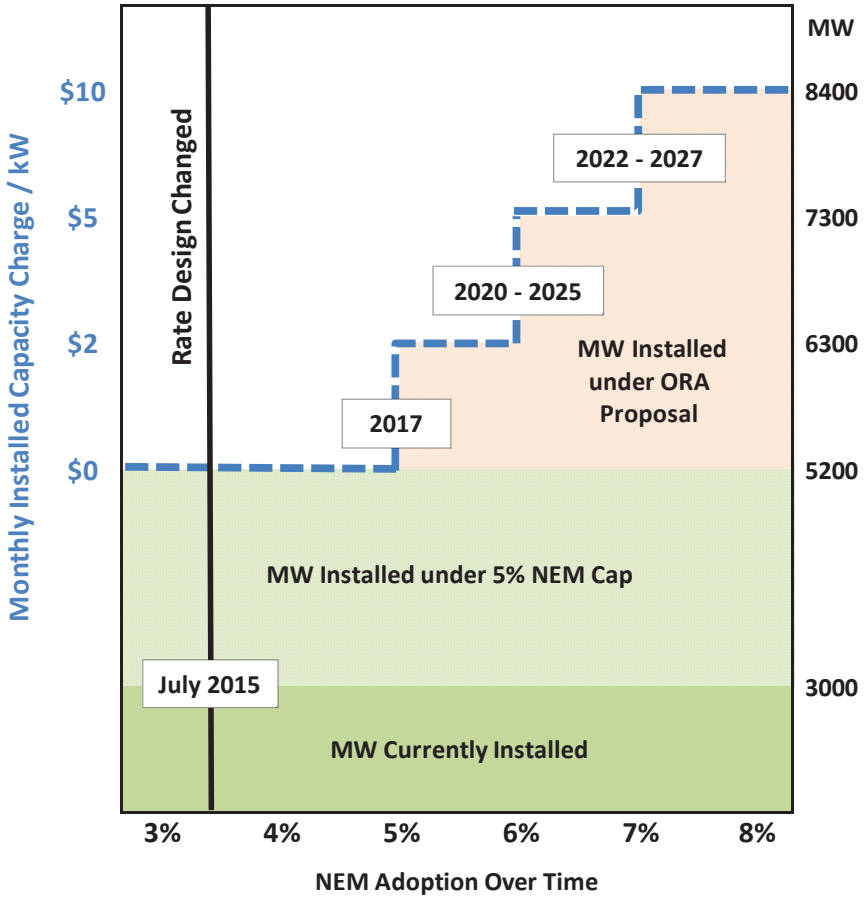
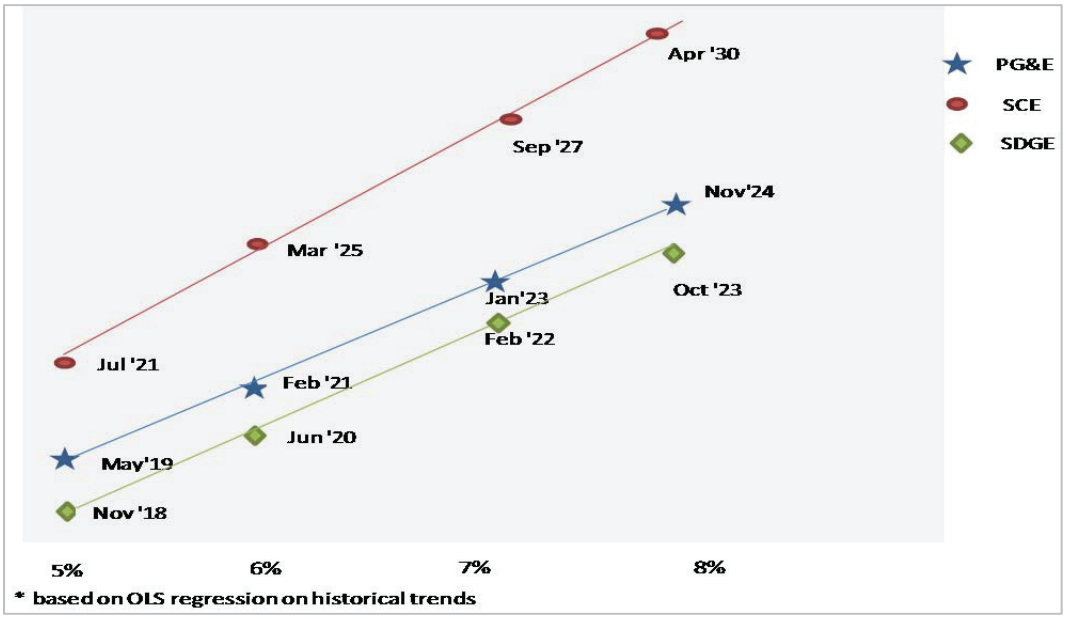


Figure 5: Cumulative Successor Tariff Installation Forecast



The initial

$2/kW/Month ICF was selected as a modest initial fee based on the assumption that a fee of this size can begin reducing the embedded subsidy in a meaningful way while ensuring that California solar incentives remain robust. The results of ORA's public tool scenarios also show that a $2/kW/Month ICF has minimal impacts on indicators of the financial proposition for participating customers, specifically the Participant Cost Test (PCT) and the implied payback period for customer-sited renewable generators. Table 2 compares Energy Division's base case public tool scenarios to ORA's $2/kW/Month ICF scenarios.

Table 2: Comparison of base case public tool scenarios to $2/kW/Month ICF scenarios.

		ED Base Case Scenarios		ORA $2 ICF Scenarios	
Renewable DG Case	Default Residential Rate	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)
High	2-Tiered	16,047	5.01	16,775	5.18
Low	2-Tiered	11,985	7.13	12,581	7.40
High	TOU1	14,707	4.77	15,313	4.96
Low	TOU1	11,771	6.72	11,951	6.99
High	TOU2	15,622	5.05	16,778	5.25
Low	TOU2	12,098	7.18	12,398	7.51

The ICF is not a revenue neutral fee that substitutes a charge for a demand-related revenue requirement that is currently recovered in an energy volumetric rate. Thus there is no commensurate reduction in other rate design elements and the utilities will credit the ICF revenues directly to residential electricity customers in rates.

The ICF described in this section applies to the existing NEM tariff, the Virtual Net Metering tariff, and the NEM Aggregation tariff, as well as, to systems greater than 1 MW in size. The variants of the ORA's proposed successor tariff are discussed further, in section 6.

b. Solar Adoption Drives ORA's Proposal

Several parties to this proceeding have pointed out flaws in the draft public tool and the many challenges of forecasting renewable DG adoption.[31] While the Energy Division has earnestly addressed many comments on the draft public tool with modifications incorporated into the final version of the public tool,[32] the outstanding concern that renewable DG adoption cannot be accurately forecasted persists. In designing the successor tariff proposals, all parties are faced with answering the question - *What will be the economic effect of the successor tariff?* Designing the successor tariff based on adoption forecasts has the potential to either be too aggressive, resulting in an undesirable suppression of the solar market; or not aggressive enough, resulting in a tariff that has little effect. ORA's proposed tariff does not in fact need to answer this question. ORA's tariff is designed around a mechanism that allows the ICF to increase as solar adoption increases, or to remain unchanged if adoptions slow. By starting with a small fee added to the existing NEM tariff, with fee increases pegged to adoption, ORA's tariff all but guarantees that the Commission will get the desired results. For evidence of this effect, the Commission need only review the considerable success of the CSI program, which was designed around a similar mechanism. The Energy Division's 2015 CSI Annual Program Assessment describes this mechanism most succinctly:[33]

> *The CSI program's financial incentives decline in steps as more capacity is installed. The declining incentives, required by PU Code Section 2851, are intended to help the program meet its goal of creating a self-sustaining solar industry by reducing rebates as the solar industry grows. Each step has an installed MW target that triggers the subsequent step down in incentive level.*

By tying ICF increases to NEM adoption milestones, ORA's proposal ensures that increasing fees do not outpace the rate of adoption and that the tariff adjusts to actual adoption, rather than theoretical adoption.

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[31] For Example: ORA Comments on Draft Version of Public Tool, April 28, 2015, Page 1; PG&E Comments on Draft Version of Public Tool, April 28, 2015, Page 2; Solar Parties Comments on Draft Version of Public Tool, April 28, 2015, Page 3; IREC Comments on ALJ Ruling Seeking Post-Workshop Comments, Oct 1 2014, Page 14.

[32] ADMINISTRATIVE LAW JUDGE'S RULING SETTING SPECIFICATIONS FOR THE FINAL VERSION OF THE PUBLIC TOOL AND ACCEPTING INTO THE RECORD THE FINAL VERSION OF THE PUBLIC TOOL, Attachment 1, Page 1.

[33] http://www.cpuc.ca.gov/NR/rdonlyres/8E158382-9114-4756-B0C7-AA6CA1A110A4/0/CSI_2015AnnualReport_FINAL.pdf, Page 21.

c. Standard Successor Tariff Grandfathering Mechanism

Under ORA's proposal, each of the solar adoption milestones will create a new vintage of residential customer generators, following principles adopted by the Commission in Decision 14-03-041.[34] To ensure a predictable payback period, customers who take the successor tariff will be grandfathered at that ICF level for a 10 year period, after which the customer will transition to the ICF that is applicable at that time.

d. Rationale for ORA's Successor Tariff Proposal

ORA proposes an ICF because it is simple and comprehensive. There is precedence for ORA's proposal as similar mechanisms are also in use in other states.[35] When fully phased in, the ICF can address the two embedded subsidies associated with the existing NEM tariff:

- An export compensation rate that is based on the full retail rate, and
- Marginal demand costs imposed on the utility when the customer generator is not generating, which are not recovered through volumetric rates.

The ORA proposal has the advantage that is can be overlaid onto any existing rate schedule, which provides NEM customers the same wide choice of rate schedules as non-NEM customers. The ICF also is designed to recover costs placed on the system by customer-generators during hours when their generators are not operating.

ORA's proposed ICF is designed to have step increases as the deployment of customer-generation increases, while also providing a mechanism to deliberately reduce the embedded subsidy over time in a manner that does not inhibit the growth of customer-sited renewables.

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[34] DECISION ESTABLISHING A TRANSITION PERIOD PURSUANT TO ASSEMBLY BILL 327 FOR CUSTOMERS ENROLLED IN NET ENERGY METERING TARIFFS, April 4, 2014. ORA specifically proposes that rules regarding capacity additions, transferability, and the addition of energy storage adopted by D.14-03-041 apply to the customer vintages created by ORA's proposed tariff.
http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M089/K386/89386131.PDF

[35] Arizona APS currently charges solar customers $0.70/kW-month and has a pending request to increase that charge to $3.00/kW-month. Arizona SRP charges a monthly service charge of $12.50 and a TOD peak demand charge of $6-$28/kW. Wisconsin We Energies established a fixed charge of $9 to $16/month and a $3.79/kW-month of installed DG cap.

ORA's proposal also phases in the ICF over a multi-year period of time, based on actual California NEM adoption, so that the solar industry can continue to "grow sustainably" (PU Code § 2827.1(b) (1)). To the extent that ORA's proposed tariff does not address 100% of the cost shifting to non-participants in the short run, it maintains robust solar incentives while creating a glide-path to a future where "total benefits … to all customers" will be "approximately equal to the total costs" (PU Code § 2827.1(b)(2)). To provide certainty for any prospective NEM customer, ORA proposes a grandfathering provision where customers can remain on the same ICF from the date of interconnection to ten years later. ORA's public tool scenarios show that ten years is long enough to incorporate the payback periods for customer generator systems.[36] After ten years, customers would revert to the then-current ICF.

5. Discussion of Statutory Criteria

a. Sustainable Growth

PU Code § 2827.1(b)(1) states that in developing the standard contract or tariff, the Commission shall ensure that the standard contract or tariff made available to eligible customer-generators ensures that customer-sited renewable distributed generation continues to grow sustainably. ORA agrees with ED Staff's interpretation of sustainable growth "as preserving and fostering sufficient market conditions to facilitate robust adoption while minimizing potential cost impacts to non-participants gradually over time." Accordingly, ORA proposes a successor tariff design that is intended to reduce subsidies embedded in the current NEM tariff design that does not also adversely impact the continued growth of solar. ORA considers "adverse impacts on the growth of solar" to materialize as adoption that declines over a multi-year period, where lagging adoptions can be directly attributed to the successor tariff policies and not to other market effects or policies outside of the CPUC's jurisdiction (such as the ITC reduction).

In order to comply with the ALJ's request to evaluate §2827.1 statutory requirements based on results from public tool simulations, ORA proposes to evaluate sustainable growth using the

[36] All of the public tool scenarios modelled by ORA and discussed in this proposal are estimated to have payback periods less than 10 years.

same measures recommended by Energy Division Staff,[37] specifically the PCT and the implied payback period for a customer-sited renewable generation system.

Following the rationale of ORA's definition for sustainable growth, the elimination of subsidies embedded in the current NEM tariff should be observable in the public tool as Ratepayer Impact Measure (RIM) ratios at or above 1.0. ORA eliminated from consideration public tool scenario results where the full reduction of the embedded subsidy resulted in forecasted installations that are significantly reduced over a multi-year period.[38]

None of ORA's proposed ICF values modeled in the public tool result in PCT ratios that fall below 1.0, indicating that all of the ICF values in ORA's proposed successor tariff will remain economically attractive to participating customers. Similarly, all of the public tool scenarios proposed as part of the successor tariff are estimated to have payback periods less than 10 years. As table 3, below, indicates, the $2 installed capacity fee has a small effect on the RIM and payback period, and has a *positive effect* on adoption.

[37] ADMINISTRATIVE LAW JUDGE'S RULING (1) ACCEPTING INTO THE RECORD ENERGY DIVISION STAFF PAPERS ON THE AB 327 SUCCESSOR RIFF OR CONTRACT; (2) SEEKING PARTY PROPOSALS FOR THE SUCCESSOR TARIFF OR CONTRACT; (3) SETTING A PARTIAL SCHEDULE FOR FURTHER ACTIVITIES IN THIS PROCEEDING. Attachment 1, Page 1-8.

[38] With the exception of out years that are lower as customer bins begin to approach saturation, and lower adoption in 2017 compared to 2016 that is magnified by the ITC reduction.
See response to Question 23 in the Energy Division's Public Tool Q&A.
http://www.cpuc.ca.gov/NR/rdonlyres/23858BC3-95CF-467C-B431-951919F8C397/0/PublicToolDocumentation6252015.pdf

Table 3: Public Tool Results; Adoption, PCT, and Payback; $2/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)	Average Participant Benefit/Cost Ratio (PCT)
High	2-Tiered	2	16,775	5.18	1.90
Low	2-Tiered	2	12,581	7.40	1.33
High	TOU1	2	15,313	4.96	1.98
Low	TOU1	2	11,951	6.99	1.41
High	TOU2	2	16,778	5.25	1.87
Low	TOU2	2	12,398	7.51	1.31

The ICF is increased to $10/kW/Month when NEM penetration in a IOU service area reaches 7%. The effects of the $10 ICF on annual incremental capacity installations for the high and low DG value scenarios are show in figures 10 and 11. ORA only analyzed the TOU 2 base case and TOU 2 base case with a $10 ICF based on the assumption that default TOU rates will be implemented by the time the ICF is raised to $10. The model results for the $10 ICF with low DG value assumptions shows a noticeable drop in adoption in 2017, a rapid increase between 2019 and 2020, and a steep recovery to 2024. ORA's proposed successor tariff would not implement the $10 ICF until solar penetration in a IOU service area reaches 7% of aggregate peak demand, which ORA estimates to occur between 2022 and 2027. Therefore ORA recommends that the Commission focus on adoption of a $10 ICF beginning in 2022, at the earliest, when contemplating the effects of the $10 ICF on adoption under low DG value assumptions.

The cumulative installation forecast, PCT, and payback for each of ORA's public tool scenarios are shown in tables 3 through 5, and the Cost Impacts to non-participating customers for systems installed from 2017 to 2025 (RIM All Generation Case) are shown in tables 6 through 8.

Table 3: Public Tool Results; Adoption, PCT, and Payback; $2/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)	Average Participant Benefit/Cost Ratio (PCT)
High	2-Tiered	2	16,775	5.18	1.90
Low	2-Tiered	2	12,581	7.40	1.33
High	TOU1	2	15,313	4.96	1.98
Low	TOU1	2	11,951	6.99	1.41
High	TOU2	2	16,778	5.25	1.87
Low	TOU2	2	12,398	7.51	1.31

Table 4: Public Tool Results; Adoption, PCT, and Payback; $5/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)	Average Participant Benefit/Cost Ratio (PCT)
High	2-Tiered	5	16,570	5.71	1.72
Low	2-Tiered	5	11,199	8.05	1.22
High	TOU1	5	16,591	5.28	1.86
Low	TOU1	5	12,069	7.48	1.31
High	TOU2	5	16,596	5.77	1.70
Low	TOU2	5	11,142	8.19	1.20

Table 5: Public Tool Results; Adoption, PCT, and Payback; $10/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Forecasted Installations 2017-2025 (MW)	Average Implied Payback of Renewable DG systems (Years)	Average Participant Benefit/Cost Ratio (PCT)
High	2-Tiered	10	15,255	6.78	1.45
Low	2-Tiered	10	8,262	9.14	1.07
High	TOU1	10	15,962	6.18	1.59
Low	TOU1	10	9,609	8.52	1.15
High	TOU2	10	15,265	6.91	1.42
Low	TOU2	10	8,067	9.31	1.05

Table 6: Public Tool Results; Cost Impacts on Non-Participating Customers for Systems Installed 2017-2025 (RIM All Generation Case); $2/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Average Non-Participant Benefit/Cost Ratio	Forecasted Installations 2017-2025 (MW)	Ratepayer Impact/Bill Increase (% of Res. RR)
High	2-Tiered	2	0.50	16,775	11%
Low	2-Tiered	2	0.25	12,581	16%
High	TOU1	2	0.48	15,313	12%
Low	TOU1	2	0.24	11,951	18%
High	TOU2	2	0.51	16,778	13%
Low	TOU2	2	0.25	12,398	17%

Table 7: Public Tool Results; Cost Impacts on Non-Participating Customers for Systems Installed 2017-2025 (RIM All Generation Case); $5/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Average Non-Participant Benefit/Cost Ratio	Forecasted Installations 2017-2025 (MW)	Ratepayer Impact/Bill Increase (% of Res. RR)
High	2-Tiered	5	0.55	16,570	10%
Low	2-Tiered	5	0.28	11,199	13%
High	TOU1	5	0.51	16,591	14%
Low	TOU1	5	0.25	12,069	19%
High	TOU2	5	0.55	16,596	12%
Low	TOU2	5	0.28	11,142	15%

Table 8: Public Tool Results; Cost Impacts on Non-Participating Customers for Systems Installed 2017-2025 (RIM All Generation Case); $10/kW/Month ICF scenarios.

Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Average Non-Participant Benefit/Cost Ratio	Forecasted Installations 2017-2025 (MW)	Ratepayer Impact/Bill Increase (% of Res. RR)
High	2-Tiered	10	0.65	15,255	9%
Low	2-Tiered	10	0.34	8,262	9%
High	TOU1	10	0.59	15,962	13%
Low	TOU1	10	0.30	9,609	13%
High	TOU2	10	0.66	15,265	10%
Low	TOU2	10	0.35	8,067	9%

The public tool is not designed to model a solar capacity charge that adjusts over time, so ORA constructed an adoption forecast that is an aggregation of public tool results from the $2, $5 and $10 /kW-month installed capacity fee scenarios. The methodology for constructing the aggregated adoption forecast is discussed in section 9.d. The purpose of constructing an aggregated adoption forecast is to simulate the annual adoptions from 2017 to 2025 with the ICF increases from $2 to $5 and $10. The aggregated adoption forecasts, under both the low and high DG value assumptions, are displayed in figures 6 and 7.

Figure 6: Aggregation of Low DG Value Adoption Assumptions (MW)

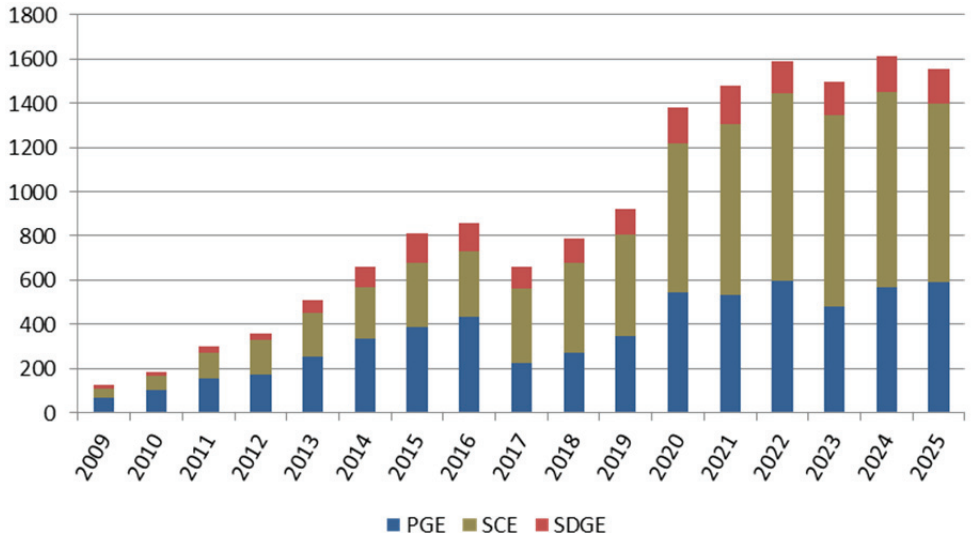
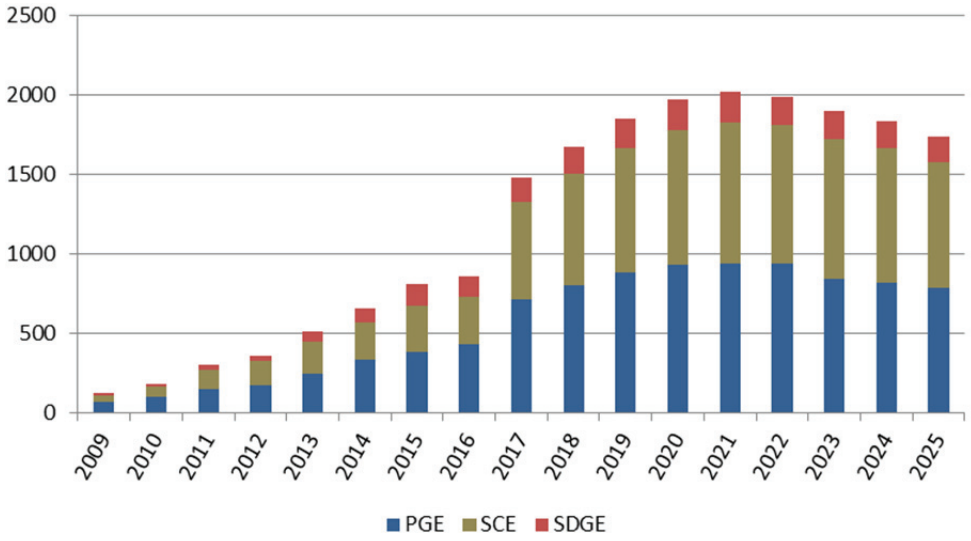


Figure 7: Aggregation of High DG Value Adoption Assumptions (MW)



b. Based on Costs and Benefits / Costs and Benefits Approximately Equal

PU Code §§ 2827.1(b)(3) and 2827(b)(4) directs the Commission to ensure that the standard contract/tariff is based on the costs and benefits of the renewable electrical generation facility and that the total benefits of the standard contract or tariff to all customers and the electrical system are approximately equal to the total costs.

As stated in comments on the February 23, 2014 assigned ALJ ruling,[39] ORA interprets PU Code § 2827.1(b)(3) to mean that the utilities' avoided costs (benefits) and the costs of the renewable generator plus the utilities' costs to administer the contract/tariff (costs) associated with distributed solar generally need to be among the primary factors to consider when developing the new tariffs or contracts. To balance the cost and benefits accruing to non-participants, the successor tariff must reduce the cost shifts, or embedded subsidies, that exist within the current NEM program. As specified in Section 2.b. above, ORA, like ED Staff, relies on the RIM test to evaluate potential cost shifts that may be imposed on non-participants.[40] And also like ED Staff, ORA focuses on the "all-generation" RIM test to measure the total benefits and total costs as directed in PU Code § 2827.1(b)(4).[41] ORA chose to rely on the RIM test ratios and estimates of residential bill increases from the public tool as a means to evaluate the effect that the $2, $5, and $10 installed capacity fees are expected to have on the cost and benefits of the successor tariff.

To determine when costs are equal to benefits, ORA used the public tool to estimate the ICF values that would allow the ICF revenues to be equal to the under-collection that result from successor tariff customers receiving export credits and offsetting their own load. ORA's methodology for calculating these ICF estimates and the ICF estimates themselves are presented in section 9.c. ORA tested the estimated ICF values that would be required to cover the cost shift in the public tool and found that fees of such a magnitude have an unacceptable effect on adoption. ORA then used the public tool to systematically test installed capacity fees ranging from $1 to $20 to determine the appropriate fee to be implemented at the final step of ORA's proposed glide-path. Based on this experimentation, ORA concludes that a $10/kW/Month fee would be an appropriate fee to charge customer generators. ORA estimates with the regression analysis presented in section 9.b. that the step up to a $10 ICF would occur close to 2025, at which time the public tool predicts annual adoptions to be 1,400 MW per year across all utilities. A $10 ICF is also expected to have a significant effect on

[39] ORA Opening Comments on Policy Issues, March 16, 2015, p.14.
[40] ED Staff NEM Successor Whitepaper, p. 1-10; "The Commission has a well-established history of using the RIM test to evaluate the costs and benefits of NEM."
[41] *Id*., p. 1-10.

balancing the cost shift and reducing bill impacts on non-participants, all while maintaining an average payback below 10 years.

6. Additional Successor Tariff Program Elements

a. Systems larger than 1 Megawatt (MW)

PU Code § 2827.1(b)(5) directs the Commission to "(a)llow projects greater than 1 MW that do not have significant impact on the distribution grid to be built to the size of the onsite load if the projects with a capacity of more than 1 MW are subject to reasonable interconnection charges established pursuant to the utilities' Electric Rule 21 and applicable state and federal requirements."[42] ORA proposes to allow participation of projects greater than 1 MW in NEM by applying the same successor tariff requirements of the installed capacity fee (ICF) as described above in section 4 and sized to not exceed available onsite load and requiring compliance with the Rule 21 Fast Track process. ORA's proposal for systems larger than 1 MW is consistent with the ED Staff assumption for systems sized above 1 MW in its Staff Paper.[43]

ED Staff explains that the Public Tool incorporates systems larger than 1 MW when testing successor tariff designs.[44] So ORA's analysis of the costs and benefits of its proposal includes customers with systems larger than 1 MW. Just as ORA's proposal achieves sustainable growth and approaches approximately equal costs and benefits for NEM systems at 1 MW or less, it also achieves the same goals for systems greater than 1 MW.

However, systems greater than 1 MW must also demonstrate that they do not have a significant impact on the distribution grid and will not require distribution upgrades to mitigate reliability concerns. Under Rule 21, the utilities perform the interconnection studies and determine whether or not distribution upgrades are needed. Fast Track review consists of an

[42] PU Code § 2827.1(b)(5) http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=02001-03000&file=2821-2829

[43] Energy Division Staff Paper on the AB 327 Successor Tariff or Standard Contract (Staff NEM Successor Whitepaper), June 3, 2015, p. 1-13; "…ED Staff assumes that systems larger than 1 MW are eligible to enroll in any of the illustrative successor tariff/contract designs, and that eligibility for the program is limited to systems above 1 MW that pass the Fast-Track Rule 21 interconnection process."

[44] Staff NEM Successor Whitepaper, p.1-13.

Initial Review and, if required, a Supplemental Review that determines whether or not a project qualifies for Fast Track interconnection.[45] The Fast Track process is meant for relatively small interconnection projects, 3 MW in PG&E and SCE territory and 1.5 MW in SDG&E territory.[46] A customer generator can demonstrate that it will not have a significant impact on the distribution grid by meeting the requirements for the Fast Track Rule 21 interconnection process similar to other exporting generating facilities.[47]

PU Code § 2827.1(b)(5) also requires that NEM systems greater than 1 MW are "subject to reasonable interconnection charges established pursuant to the commission's Electric Rule 21." Currently under Rule 21, NEM projects less than one MW do not pay an Interconnection Request Fee of $800 or a Supplemental Review Fee of $2,500.[48] Instead, this cost is recovered from nonparticipating ratepayers.[49]

ORA recommends that current waivers for the Interconnection Request Fee, Supplemental Review Fee, Non-Bypassable Charges, and distribution upgrade costs be discontinued for systems greater than 1 MW for the NEM successor tariff as these systems are more likely to have a material impact on the distribution grid and may require Supplemental Review.[50] Rather than passing on the costs of reviewing and interconnecting greater than 1 MW to nonparticipants, the customer generator should pay reasonable fees for the ability to interconnect. These Interconnection Request and Supplemental Review fees have already been deemed reasonable by the Commission for other exporting generating facilities[51] and should be

[45] Rule 21, § F.2.c.1.
[46] July 29, 2014, R.11-09-011 Administrative Law Judge's Ruling Setting Schedule for Comments on Staff Reports and Scheduling Prehearing Conference, Attachment A, July 18, 2014; Cost Certainty for the Interconnection Process Staff Proposal, p. 6. "Rule 21, Sec. F.2. The eligibility threshold for generators is 3 MW in PG&E and SCE territory and 1.5 MW in SDG&E territory. Rule 21 Sec. E.2.b.i: Interconnection Request Submission Process, Fast Track Eligibility." http://www.cpuc.ca.gov/NR/rdonlyres/9B6BD464-FBF1-4B7E-94F4-08E504012480/0/CostCertaintyFINAL724_2.pdf
[47] Rule 21, § E.2.b.i: Interconnection Request Submission Process, Fast Track Eligibility. http://www.pge.com/tariffs/tm2/pdf/ELEC_RULES_21.pdf
[48] Rule 21, Table E-1.
[49] D.02-03-057, p.13.
[50] Supplemental Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection, or (ii) the Generating Facility requires further study. Rule 21, § F.2.c.i: Supplemental Review. http://www.pge.com/tariffs/tm2/pdf/ELEC_RULES_21.pdf
[51] Adopted in Rule 21, Table E-1.

similarly applied to NEM systems greater than 1 MW seeking interconnection in compliance with the statute.

In addition to discontinuing the Interconnection Request Fee waiver and Supplemental Review Fee waiver, ORA also recommends discontinuing all of the remaining secondary benefits of NEM for systems greater than 1 MW including all fee and exemption waivers. ORA has demonstrated, in section 3 of this proposal, that NEM solar resources are twice as expensive as solar resources procured by competitive means. California already has competitive mechanisms in which to procure solar resources greater than 1 MW (e.g., ReMAT, Utility Solar PV programs). Solar generators should be limited to the procurement mechanism that results in the most cost-effective result for ratepayers. As such, eliminating all secondary benefits for systems greater than 1 MW will help close the gap between high price NEM energy and competitively procured solar resources.

NEM projects greater than 1 MW must also be "built to the size of the onsite load."[52] As previously stated in ORA's comments, the utilities should continue to be responsible for reviewing information on project size and comparing it to a customer's annual onsite load to determine if the project size is appropriate using a process consistent with the methods currently in place for systems 1 MW and less as applicable.[53] Currently, annual onsite load is determined using the sum of the previous 12-month energy usage(s) for all eligible meters of customers with historical usage.[54] For sites with new construction or expected future load growth, the annual onsite load should be determined using an estimate of the expected expanded consumption, preferably an engineering estimate.[55]

ORA's proposal to apply an ICF to systems greater than 1 MW satisfies the goals of the statute by allowing the participation of projects greater than one MW while ensuring that the projects will not have significant impacts to the distribution grid, will be charged reasonable

[52] PU Code §2827.1(b)(5)
[53] Comments of the Office of Ratepayer Advocates on Administrative Law Judge's Ruling Seeking Comment On Policy Issues Associated With Development Of Net Energy metering Successor Standard Contract of Tariff, p.22.
[54] August 2014, CSI Handbook, p.24.
http://www.gosolarcalifornia.ca.gov/documents/CSI_HANDBOOK.PDF.
[55] *Id.,* p.26.

interconnection costs and will be sized to onsite load. The proposal considers the costs and benefits of NEM systems including those greater than 1 MW and ensures a decrease in the cost shift between participants and nonparticipants while maintaining sustainable growth for solar.

b. Virtual Net Metering

The Commission first established virtual net metering in D.08-10-036 for the Multifamily Affordable Solar Housing (MASH) Program, allowing customers to allocate electricity generated from a single solar energy system as kilowatt hour credits to other accounts on the affordable housing property.[56] It allows tenants in multifamily housing with individual meters to participate and benefit from NEM. In D.11-07-031, the Commission expanded the availability of virtual net metering (VNM) to any multi-tenant or multi-meter building, not just MASH projects.[57] ORA recommends that MASH VNM and VNM be allowed to continue for NEM 2.0 to continue to allow multifamily units the ability to participate in NEM as intended by the Commission when approving the programs. ORA's proposal for an installed capacity fee (ICF) would also apply to VNM participants.

Currently under VNM, the generating system owner allocates the percentage of output of the solar system to common and tenant areas and determines the portion of the system output between tenants based on the relative sizes of the units.[58] The ICF should be similarly allocated to VNM participants using the same percentage breakdowns to match costs with the benefits of each participant.

ORA opposes expansion of VNM to renewable systems sized at greater than 1 MW. VNM generators greater than 1 MW can participate in the utilities competitive mechanisms, such as the Renewable Market Adjusting Tariff (ReMAT) Program for eligible renewable projects up to 3 MW.[59] Solar resources can be procured through the ReMAT program at a fraction of the cost of procuring the same solar resources through the NEM tariff.

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[56] D.08-10-036, p.52.
[57] D.11-07-031, p.65.
[58] D.08-10-036, p.33; Electric Schedule NEMV, Sheet 11. http://www.pge.com/tariffs/tm2/pdf/ELEC_SCHEDS_NEMV.pdf
[59] D.12-05-035, p.124.

While ORA's proposal for an ICF addresses the issue of the cost shift between participants and non-participants of NEM, it does not address the high cost of NEM compared to utility procured solar. ORA does not see the need to expand VNM to systems greater than one MW since it would only force ratepayers to pay higher prices for solar than could be procured at lower price by the utilities.

c. NEM Aggregation

In Resolution E-4610, the Commission authorized the IOUs to implement NEM Aggregation (NEMA) pursuant to Senate Bill 594 (Wolk).[60] NEMA allows an eligible customer-generator with multiple meters to use renewable DG to offset the electricity aggregated from the meters located on the property where the generation facility is located, and on all property adjacent or contiguous to the property on which the generation facility is located. [61] The customer-generator must be the sole owner, lessee, or renter of the properties and have systems sized to not exceed available onsite load in order to utilize NEMA. ORA recommends that NEMA be allowed to continue for the NEM Successor Tariff ORA's proposal for an installed capacity fee would also apply to NEMA participants

ORA monitors the quantities of NEMA applications and more time is necessary to gather information on the impact of the program. Since the program was approved in February 2014, there have been relatively few applications and little data. The table below shows the number of applications by utility.

[60] Resolution E-4610, p.1. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K158/77158265.PDF
[61] *Id.,* p.2.

Table 9: Number of NEMA Applications per Utility

Utility	Number of NEMA Applications
PG&E[62]	535*
SCE[63]	49
SDG&E[64]	11

*Note that PG&E's count includes both interconnection requests for new generating facilities as well as contract conversions where a pre-existing NEM generating facility converted to a NEMA agreement by supplying additional load accounts and a supplemental NEMA appendix form.

The intent of the NEMA program is to "allow eligible customer-generators to aggregate their load from multiple meters" to provide more opportunities for NEM participation without increasing the expected revenue obligations of customers who are not eligible customer-generators.[65] Given the limited data, ORA recommends allowing the program to continue to gather information on whether or not the program is meeting the goals of the Commission.

Consistent with ORA's recommendations for VNM systems, ORA opposes expansion of NEMA to renewable systems sized at greater than 1 MW. NEMA generators greater than 1 MW can participate in the utilities competitive mechanisms, such as the Renewable Market Adjusting Tariff (ReMAT) Program. As previously discussed, energy produced by solar systems sized a 1 MW and above can be procured at lower prices through other utility mechanisms, such as the ReMAT, rather than through NEM. Given the relative expense of solar procured through NEM

[62] PG&E Data Request in R.14-07-002 ORA_002-Q013, Dated February 23, 2015
[63] SCE Data Request in R.14-07-002 ORA-SCE-003-NEM-003 Question 10, Dated February 13, 2015
[64] SDG&E Data Request in R.14-07-002 ORA-SDG&E-DR-02, Dated February 24, 2015
[65] Resolution E-4610, p.2.

compared to other utility procurement, ORA does not see the need to impose greater costs on ratepayers by expanding NEMA to systems greater than 1 MW.

d. Safety and Consumer Protection Issues

Electric Rule 21 contains rules and regulations regarding the safe interconnection, operating and metering requirements for generation connected to the utility's distribution system, including distributed generation participating in NEM.[66] As previously discussed, Rule 21 requires the utilities to review any interconnection requests to ensure the safety of any request before approval of interconnection.[67] The Commission is currently addressing improvements to its distribution level interconnection rules and regulations in R.11-09-011 and recently passed D.14-12-035 which addresses updated standards for inverters that will facilitate greater deployment of distributed generation.[68] Rule 21 and the Commission's processes to address updates to the Rule sufficiently address safety issues for distributed generation. ORA has no additional recommendations for public safety policies and procedures for successor tariff renewable distributed generators.

ORA recommends resurrecting and modifying certain CSI program consumer protection measures for successor tariff participants. Continuing the consumer protection measures described in this section is a key part of the Commission's public service mission. The consumer protection measures recommended by ORA are necessary in order to help utility customers to avoid and resolve common problems that may arise.

ORA's principal recommendation for consumer protection is to ensure that solar consumers continue to have readily available transparent and objective information about their rights as utility customers; their available energy choices; the potential economic and lifecycle consequences of purchasing, leasing, or entering into a power purchase agreement; and the impact that changing underlying rates can have on the economics of their energy choices. ORA recommends continuing the GoSolarCalifornia website,[69] which should be updated to include

[66] http://www.cpuc.ca.gov/PUC/energy/rule21.htm
[67] Rule 21, § F.
[68] D.14-12-035, p.1-3.
[69] http://www.gosolarcalifornia.ca.gov/

comprehensive and well organized information about the renewable distributed generation, the existing NEM tariff, and information about the successor tariff when it is adopted by the Commission. The utility companies and the California Energy Commission, the current administrator of the GoSolarCalifornia website, should prepare a plan for funding, updating, and maintaining the GoSolarCalifornia website that all stakeholders in this proceeding have an opportunity to comment on to ensure that information about the successor tariff is sufficiently included.

At a minimum, the GoSolarCalifornia website update plan should include the following functions:

- Information to help consumers understand the economics of self-generation and the successor tariff, including the variety of mechanisms for self-generating such as direct ownership, leasing and power purchase agreements.
- Information about other mechanisms available for purchasing renewable energy, such as through the utilities' green tariffs and community solar tariffs.
- Information about consumers' legal rights when conducting business with solar installers and their utility company.
- Information about the regulatory obligations of the consumers' utility company, such as interconnection standards, inspections, and interconnection scheduling.
- Information about best practices within the solar industry, such as installation, contracting, and pricing.
- Information about known cases of actual or suspected fraud and misleading marketing within the California solar market.
- Continuation of the list of modules and inverters that have safety certification from a Nationally Recognized Testing Laboratory and have had their electrical characterization data tested by a third party laboratory.
- Information about existing resources available to consumers who need to register a complaint or resolve a dispute, including which agencies should address which types of complaints and disputes.

Implementation of ORA's proposed installed capacity fee will require inspections by the utilities' interconnection departments to validate the rated capacity of renewable generator systems prior to interconnection. This presents an opportunity for the utilities to offer an optional inspection of the system, at the customer's request, which reviews a standard set of system parameters and provides an inspection report to the customer. The optional inspection will perform the following functions, at a minimum:

- Check if the installed system corresponds to what the customer has contracted for.
- Check if the system is installed following industry best practices.
- Identify any potential maintenance issues that the customer should be aware of, such as potential future module shading.
- Provide an independent assessment of the systems performance potential based on the observed system specifications.

ORA recommends that Commission staff coordinate with the Department of Consumer Affairs (DCA) and other consumer service agencies to assist staff at those agencies have the information and training they need to respond to consumer complaints related to distributed generation and the successor tariff.

7. Legal Issues

The Commission requests parties to identify and describe any legal issues, including any open legal questions, associated with parties' proposals, and to provide an explanation as to how their proposal is consistent with the relevant legal requirements.[70] ORA's proposal is consistent with state and federal laws and regulations, and Commission decisions.

8. Disadvantaged Communities

PU Code § 2827.1(b)(1) directs the Commission to "(e)nsure that the standard contract or tariff made available to eligible customer-generators ensures that customer-sited renewable

[70] *See* CAL. PUB. UTIL. COMM'N, Administrative Law Judge's Ruling (1) Accepting into the Record Energy Division Staff Papers on the AB 327 Successor Tariff or Contract; (2) Seeking Party Proposals for the Successor Tariff or Contract; (3) Setting a Partial Schedule for Further Activities in this Proceeding, Rulemaking 14-07-002, 10 (June 4, 2015).

distributed generation continues to grow sustainably and include specific alternatives designed for growth among residential customers in disadvantaged communities. ORA's proposal is for the Commission to wait for data on the SASH third party financing program and consider expansion of funding for incentives based on experience.

ORA recommends defining disadvantaged communities based on income using already established methods in other proceedings and programs. Adopting a broad definition that includes qualifications from programs such as the CSI Multi-Family Affordable Solar Home (MASH) and Single-Family Affordable Solar Home (SASH) programs or the (California Alternate Rates for Energy) CARE program will ensure that NEM is available to as many low-income customers as possible.[71] If the customer qualifies for MASH, SASH or CARE, they would qualify as a member of disadvantaged communities for the purposes of NEM. Using income to determine eligibility focuses on the issue of affordability of NEM by identifying those customers whose income cannot typically support NEM participation. This method also provides a simple screening process easily understood by customers to determine eligibility for this proposal and would allow the IOUs to leverage existing programs and outreach opportunities.

ORA defines NEM "growth among residential customers in disadvantaged communities" as a greater number of total disadvantaged community participants in NEM in a given year than the previous year. This definition sets a goal for more disadvantaged community members to participate in NEM from one year to another while acknowledging that there may not be a silver bullet to break down the barriers to adoption to facilitate participation to the same level as other NEM participants.

Expansion of third party financing should address the up-front costs of disadvantaged communities' participation in the SASH program. PU Code § 2851(f) requires installation of

[71] August 2014 CSI Handbook for MASH and SASH eligibility requirements, p.21 and p.194-195.
http://www.gosolarcalifornia.org/documents/CSI_HANDBOOK.PDF
CARE eligibility requirements available on the CPUC website.
http://www.cpuc.ca.gov/PUC/energy/Low+Income/care.htm

similar capacity with half the funding per installed watt of the existing program.[72] To address these stringent requirements, the Commission directed Grid Alternatives to submit an Advice Letter with a proposal for a third-party ownership (TPO) model for SASH in D.15-01-027.[73] The Commission approved the TPO model in Resolution E-4719 on June 25, 2015.[74] The Commission should wait and review information on the results of the model and consider additional funding for incentives to maintain and expand the program if it is shown to be effective. This proposal is similar to one made by ED Staff to expand SASH and MASH funding to address the upfront financial cost of installing solar systems.[75]

In comments, ORA identified the main barrier to solar adoption among disadvantaged communities as the financial cost of adoption, particularly the cost of the system, based on the California Solar Initiative – Low-Income Solar Program Evaluation Market Assessment Report.[76] Third party ownership has the potential to increase adoption of solar among low income customers by transferring the burden of financing from homeowners to third parties. ORA's proposal would leverage and expand an approved program that already aims to address the financial barrier to solar adoption among disadvantaged communities. The Commission simply needs to gain experience with the TPO model before considering additional funding to continue and expand the SASH TPO model for low income customers. Doing so will avoid duplication, confusion, and will enhance the effectiveness of the SASH TPO model.

[72] § 2851(f) – "Upon the expenditure or reservation in any electrical corporation's service territory of the amount specified in paragraph (1) of subdivision (e) for low-income residential housing programs pursuant to subdivision (c) of Section 2852, the commission shall authorize the continued collection of the charge for the purposes of Section 2852. The commission shall ensure that the total amount collected pursuant to this subdivision does not exceed one hundred eight million dollars ($108,000,000). Upon approval by the commission, an electrical corporation may use amounts collected pursuant to subdivision (e) for purposes of funding the general market portion of the California Solar Initiative, that remain unspent and unencumbered after December 31, 2016, to reduce the electrical corporation's portion of the total amount collected pursuant to this subdivision."

[73] D.15-01-027, Page 52.

[74] http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M152/K902/152902980.PDF

[75] Energy Division Staff Paper on the AB 327 Successor Tariff or Standard Contract (Staff NEM Successor Whitepaper), June 3, 2015, p. 2-16.

[76] Comments of the Office of Ratepayer Advocates on Administrative Law Judge's Ruling Seeking Comment On Policy Issues Associated With Development Of Net Energy metering Successor Standard Contract of Tariff, p. 9-10.

9. Discussion of Analysis Methods and Results

This section provides a discussion of the methodology and results of the analyses ORA performed to develop the successor tariff proposal. Below is a discussion of the public tool scenarios, forecast estimates for solar penetration, the calculation of the installed capacity fee needed to recover the full cost of service, and the aggregation of public tool results to estimate adoption with a glide-path.

a. Public Tool Scenarios

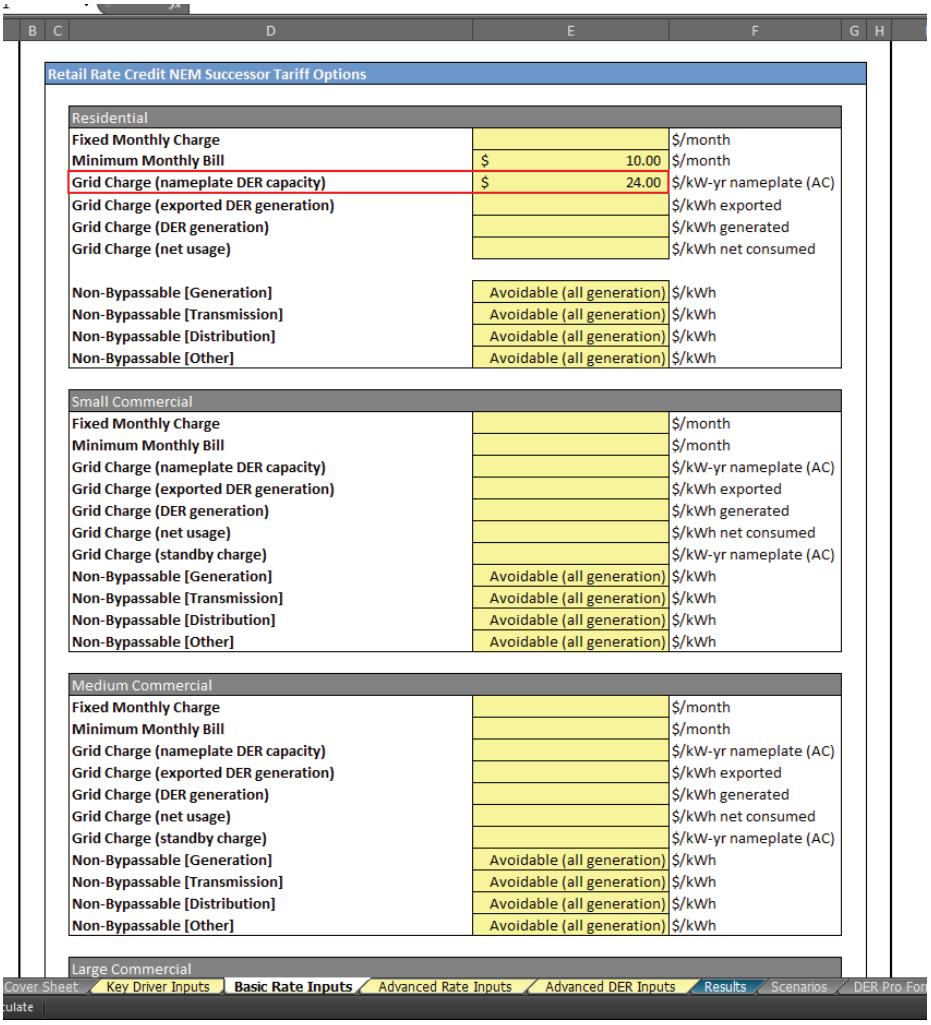
To analyze its proposed successor tariff, ORA executed 25 scenarios including the i) existing NEM under 4-tier residential rates, ii) base case scenarios for adopted two-tier residential rates and two TOU periods (TOU 1 with a peak from 2-8pm and TOU2 with a peak from 4-8pm) for high and low bookend cases and iii) the 6 base case scenarios with $2, $5 and $10 /kW-month installed capacity fees. ORA used the public tool published on July 17, 2015 (indicated in cell B13 on the public tool cover page) as required by the July 20, 2015 ALJ Ruling.[77] Since the public tool does not have the functionality to simulate fee that escalates over time when solar penetration milestones are achieved, ORA ran scenarios with different installed capacity fees for the entire period from 2017-2025.

In order to run these scenarios with the proposed ICF, ORA used the base scenarios (i.e. two-tiered and TOU1 and TOU2 for high and low bookend cases) as provided by the Energy Division Staff in the public tool and input the ICF rate to be tested under the "Grid Charge (nameplate DER capacity)" for the residential customer class (input cell E46) on the Basic Rate Inputs, as shown in Figure 10. Throughout this proposal ORA discusses a monthly installed capacity fee, however, the public tool is designed to analyze annual capacity fees so each proposed fee tested by ORA was multiplied by 12.

[77] ADMINISTRATIVE LAW JUDGE'S RULING PROVIDING FURTHER INSTRUCTIONS FOR PARTIES' PROPOSALS AND ACCEPTING INTO THE RECORD CERTAIN UPDATES TO THE PUBLIC TOOL, July 20, 2015.

Aside from simulating $2, $5, and $10 /kW-month installed capacity fees for residential customers, input into the July 17, 2015 version of the public tool as described above, ORA made no other changes to the key driver inputs, rate design assumptions, DER assumptions, or other underlying data and calculations in the public tool.

Figure 8: Inputs made to the Public Tool to simulate runs with ICF



Retail Rate Credit NEM Successor Tariff Options

Residential		
Fixed Monthly Charge		$/month
Minimum Monthly Bill	$ 10.00	$/month
Grid Charge (nameplate DER capacity)	$ 24.00	$/kW-yr nameplate (AC)
Grid Charge (exported DER generation)		$/kWh exported
Grid Charge (DER generation)		$/kWh generated
Grid Charge (net usage)		$/kWh net consumed
Non-Bypassable [Generation]	Avoidable (all generation)	$/kWh
Non-Bypassable [Transmission]	Avoidable (all generation)	$/kWh
Non-Bypassable [Distribution]	Avoidable (all generation)	$/kWh
Non-Bypassable [Other]	Avoidable (all generation)	$/kWh
Small Commercial		
Fixed Monthly Charge		$/month
Minimum Monthly Bill		$/month
Grid Charge (nameplate DER capacity)		$/kW-yr nameplate (AC)
Grid Charge (exported DER generation)		$/kWh exported
Grid Charge (DER generation)		$/kWh generated
Grid Charge (net usage)		$/kWh net consumed
Grid Charge (standby charge)		$/kW-yr nameplate (AC)
Non-Bypassable [Generation]	Avoidable (all generation)	$/kWh
Non-Bypassable [Transmission]	Avoidable (all generation)	$/kWh
Non-Bypassable [Distribution]	Avoidable (all generation)	$/kWh
Non-Bypassable [Other]	Avoidable (all generation)	$/kWh
Medium Commercial		
Fixed Monthly Charge		$/month
Minimum Monthly Bill		$/month
Grid Charge (nameplate DER capacity)		$/kW-yr nameplate (AC)
Grid Charge (exported DER generation)		$/kWh exported
Grid Charge (DER generation)		$/kWh generated
Grid Charge (net usage)		$/kWh net consumed
Grid Charge (standby charge)		$/kW-yr nameplate (AC)
Non-Bypassable [Generation]	Avoidable (all generation)	$/kWh
Non-Bypassable [Transmission]	Avoidable (all generation)	$/kWh
Non-Bypassable [Distribution]	Avoidable (all generation)	$/kWh
Non-Bypassable [Other]	Avoidable (all generation)	$/kWh
Large Commercial		

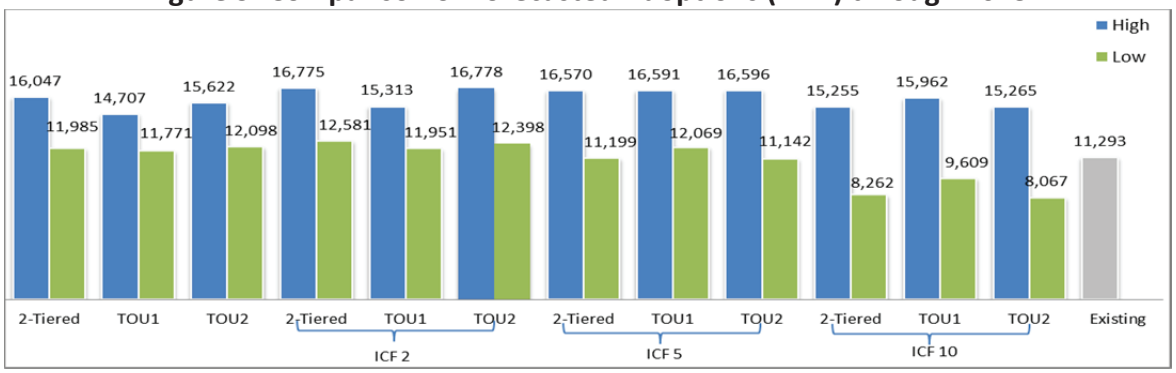
Cover Sheet | Key Driver Inputs | **Basic Rate Inputs** | Advanced Rate Inputs | Advanced DER Inputs | Results | Scenarios | DER Pro For

All model results for Forecasted Cumulative Installations, Average Implied Payback, the Participant Cost Test ratio, the Ratepayer Impact Measure test ratio (for both Export only and All Generation), Residential Bill Increases (for both Export only and All Generation), Cost of Service results, the Total Resource Cost test ratio, and the Societal Cost Test ratio are provided in Figures 9-11 and Table 10.

Figure 9 shows the forecasted capacity through 2025 under each scenario. Adoption rates for all ICF values under the high- and most low- DG value cases are higher than the forecasted capacity estimated by the existing policy pre-set in the public tool. The adoption rates are lower for the low DG value case with the $10 ICF for all the three rate structures (Tier2, TOU1 and

TOU2) compared to the existing policy scenario. If we consider the glide-path implementation of an increasing ICF over time rather than the constant $10 ICF assumed for the entire period, the overall cumulative installed capacity will be higher.

Figure 9: Comparison of Forecasted Adoptions (MW) through 2025



The average implied payback of renewable DG systems and the participant Cost Test ratio (PCT) are provided in Figures 10 and 11. The payback period for distributed generators is under 10 years for all the scenarios. The difference between the payback period of 6.55 years estimated for existing policy and the payback period for systems under a $2 or $5 /kW-month tariff are within the 1-2 year maximum difference recommended by ED.[78] The $10 ICF results in a difference greater than 2 years, but the $10 ICF would not be implemented in the near-term and are thus less important than the near-term payback period. All of the scenarios modelled by ORA return a PCT ratio greater than one, as shown in Figure 11, indicating that a successor tariff remains economically attractive to participating customers with the introduction of the ICF.

[78] ADMINISTRATIVE LAW JUDGE'S RULING PROVIDING FURTHER INSTRUCTIONS FOR PARTIES' PROPOSALS AND ACCEPTING INTO THE RECORD CERTAIN UPDATES TO THE PUBLIC TOOL, July 20, 2015. Attachment 1, Page 1-9.

Figure 10: Comparison of Average Implied Payback Period under Existing NEM with current 4-Tier Residential Rates to NEM under the adopted 2-Tier and TOU rates with Installed Capacity Fee;

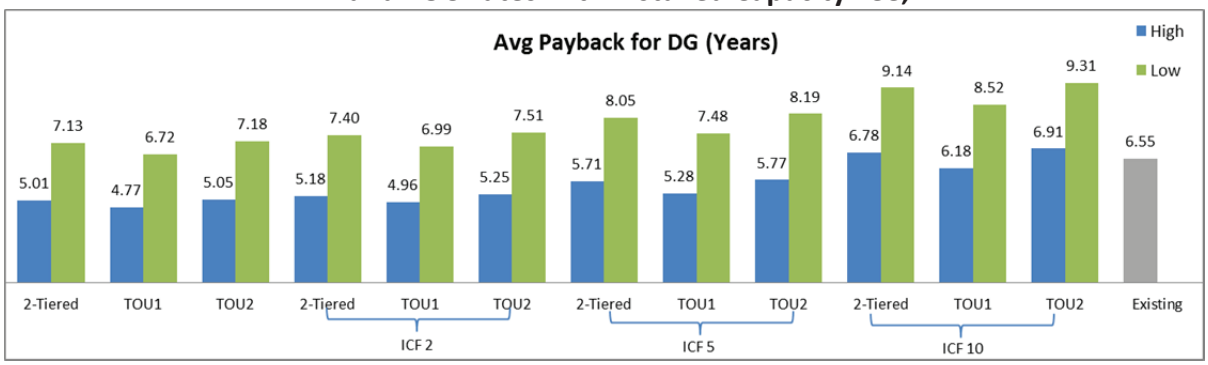


Figure 11: Comparison of Participant Benefit under Existing NEM with current 4-Tier Residential Rates to NEM under the adopted 2-Tier and TOU rates with Installed Capacity Fee;

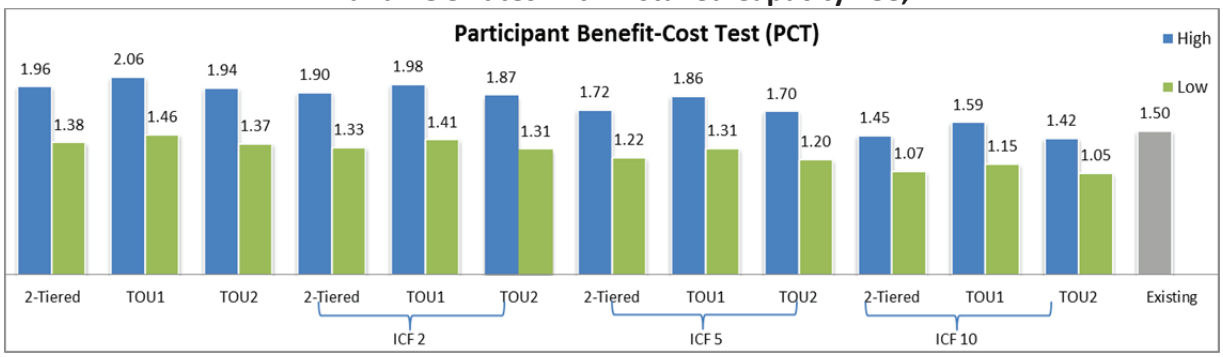


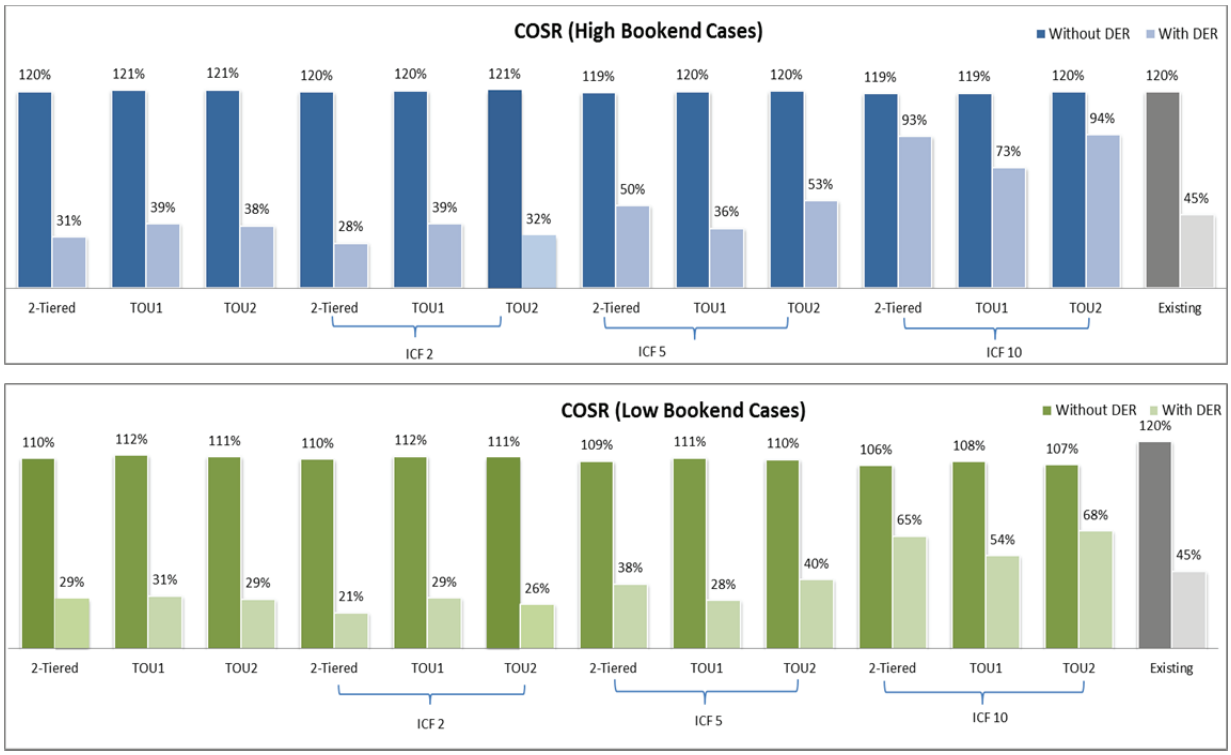
Table 10 shows the results of the two RIM tests (export only and all generation), the Total Resource Cost Test, and the Societal Cost Test. The $2 ICF has very little effect on these tests. However, these tests improve modestly with the higher ICF rates of $5 and $10.

Table 10: Cost Impacts of NEM to Non-Participating Customers for Systems Installed 2017-2025

				Cost Impact to Non Participant Customers					
				RIM Export Only		RIM All Generation Case			
Renewable DG Case	Default Residential Rate	Installed Capacity Fee (ICF $/kW-month)	Forecasted Installations 2017-2025 (MW)	Average Non-Participant Benefit/Cost Ratio	Ratepayer Impact/Bill Increase (% of Res. RR)	Average Non-Participant Benefit/Cost Ratio	Ratepayer Impact/Bill Increase (% of Res. RR)	Total Resource Cost Test	Societal Cost Test
Existing			11,293	0.42	7%	0.44	12%	0.72	0.74
High	2-Tiered		16,047	0.39	10%	0.49	13%	0.95	0.97
Low	2-Tiered		11,985	0.18	15%	0.25	19%	0.46	0.45
High	TOU1		14,707	0.34	11%	0.47	13%	0.96	0.98
Low	TOU1		11,771	0.15	18%	0.24	20%	0.46	0.45
High	TOU2		15,622	0.36	11%	0.49	12%	0.95	0.97
Low	TOU2		12,098	0.17	17%	0.25	19%	0.45	0.45
High	2-Tiered	2	16,775	0.39	11%	0.50	13%	0.94	0.97
Low	2-Tiered	2	12,581	0.18	16%	0.25	19%	0.45	0.45
High	TOU1	2	15,313	0.34	12%	0.48	12%	0.95	0.98
Low	TOU1	2	11,951	0.15	18%	0.24	20%	0.46	0.45
High	TOU2	2	16,778	0.36	13%	0.51	12%	0.94	0.97
Low	TOU2	2	12,398	0.17	17%	0.25	19%	0.45	0.45
High	2-Tiered	5	16,570	0.41	10%	0.55	10%	0.94	0.97
Low	2-Tiered	5	11,199	0.20	13%	0.28	15%	0.47	0.47
High	TOU1	5	16,591	0.33	14%	0.51	12%	0.95	0.97
Low	TOU1	5	12,069	0.15	19%	0.25	19%	0.46	0.45
High	TOU2	5	16,596	0.37	12%	0.55	10%	0.95	0.97
Low	TOU2	5	11,142	0.18	15%	0.28	15%	0.47	0.47
High	2-Tiered	10	15,255	0.43	9%	0.65	6%	0.96	0.99
Low	2-Tiered	10	8,262	0.23	9%	0.34	10%	0.51	0.51
High	TOU1	10	15,962	0.35	13%	0.59	9%	0.95	0.98
Low	TOU1	10	9,609	0.18	13%	0.30	13%	0.49	0.49
High	TOU2	10	15,265	0.40	10%	0.66	6%	0.96	0.98
Low	TOU2	10	8,067	0.22	9%	0.35	9%	0.51	0.51

The Cost of Service Recovery (COSR) results are provided in Figure 12. The COSR estimates for residential customers with DER under the low DG value for the base case scenarios is approximately 30%. The COSR at the end of the tariff glide-path is over 50% for the low DG value scenarios and 70% to 90% for the high DG value scenarios.

Figure 12: Cost of Service Recovery for Residential NEM Successor Participants



b. Solar Penetration Forecast Analysis

In order to estimate when the penetration of renewable distributed generation will reach 5%, 6%, and 7% ORA constructed curves based on historical installed capacity data submitted by PG&E, SCE, and SDG&E per PU Code § 2827(c)(4)(C).[79] These data were supplemented by responses to data requests made by ORA and CALSEIA.[80]

Figures 13 shows the cumulative MW installed under the NEM program since 1996 with a trajectory drawn for each utility from January 2011 to June 2015. Figure 14 shows the NEM interconnected capacity as a percent of aggregate customer peak demand (defined as the highest sum of all customers' non-coincident peak demands that occurs in any calendar year).

[79] These data are submitted via Advice Letter filings on the 10th of every month.
[80] PG&E Data Response "NetEnergyMetering-Tariffs_DR_ORA_002-Q01" Question 1 and 16, February 27, 2015; SCE Data Response "R.14-07-002-ORA-SCE-003-NEM-003", Question 1 and 16, February 13, 2015; SDG&E Data Response "ORA-SDG&E-DR-02", Question 1 and 16, February 24, 2015.

As of June 2015, the proportion of NEM interconnected capacity (i.e. penetration) for PG&E, SCE and SDGE are at 3.18%, 2.34% and 3.33%.

Figure 13: Cumulative NEM Installed Capacity (MW)

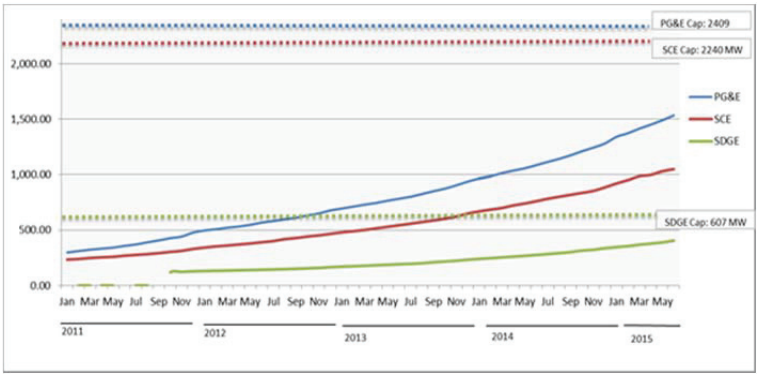
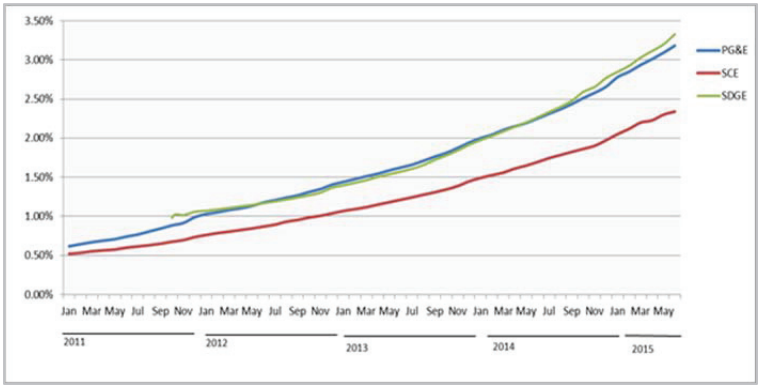


Figure 14: Cumulative NEM Installed Capacity (% Penetration)



Using this historical data, ORA developed a forecast using an ordinary least squares (OLS) regression analysis to estimate the month and year when utilities can be expected to reach penetration levels of 5%, 6%, and 7%. The regression was run using the Analysis ToolPak add-in on Microsoft Excel with monthly cumulative NEM installed capacity (in MW) treated as the dependent variable and the months as independent variable. Table 11 presents the result of the regression of the month-on-month for each utility.

The regression output for each utility shows a strong linear trend in cumulative growth of NEM installations over time with a robust R squared statistic of 95% for SDGE and over 97% for PG&E and SCE.

Table 11: Regression of Cumulative NEM Installations in MW on month

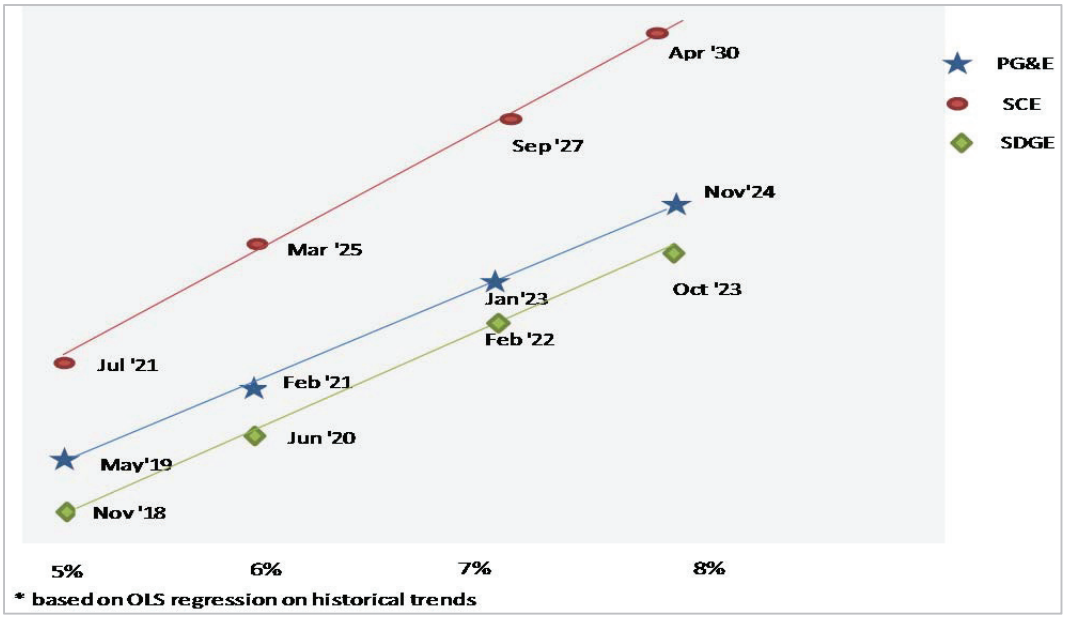
Variable	PG&E	SCE	SDGE
Constant	190.33***	145.23***	83.35***
	(14.79)	(11.20)	(5.44)
Month	21.86***	14.79***	6.08***
	(0.48)	(0.36)	(0.21)
R-squared	0.976	0.971	0.951
Observations	53	53	44
Standard errors in parentheses ***p<0.01 **p<0.05 *p<0.1			

On the basis of the above regression, we forecast the time period when each utility is expected to reach a penetration level of 5%, 6%, 7% and 8%, given the historical trends. The results are presented in Table 12 and Figure 15.

Table 12: Month and Year Estimates for Solar Penetration Milestones

Penetration	PG&E	SCE	SDGE
5%	May 2019	Jul 2021	Nov 2018
6%	Feb 2021	Mar 2025	Jun 2020
7%	Jan 2023	Sep 2027	Feb 2022
8%	Nov 2024	Apr 2030	Oct 2023

Figure 15: Cumulative Successor Tariff Installation Forecast



c. Calculation of the Installed Capacity Fee needed to recover the full cost of service.

The public tool characterizes the cost of service in terms of the percentage of cost of service recovery for each customer class, for each utility, and for both participants and non-participants. ORA used the cost of service results from the base case public tool simulations to calculate the ICF that would be required in order to recover the full costs to serve DG customers.

ORA's methodology for determining the ICF is based on ensuring that the under-collection in cost of service recovery from residential customers through the NEM rate would instead be recovered through the ICF. ORA reviewed the 2-tiered, TOU 1, and TOU 2 base case scenarios and used the information in Cell AS52 of the Results tab to determine the embedded subsidy for residential customers. The Public Tool presents this embedded subsidy as a percentage of cost of service revenue recovery but the monetary value can be determined by deducting the denominator of the equation from the numerator. This is a NPV value of installations through 2025. ORA focused on the embedded subsidy for participants from 2017 to 2025 by selecting the "Include Only NEM Successor Participants" filter in the cost of service results data area in

the public tool Results tab. ORA selected this time frame since the successor tariff is intended to address the embedded subsidy going forward rather than attempting to recover revenue under-collections caused by customers on NEM 1.0.

ORA then determined the cumulative installed capacity from 2017 to 2025 for residential participants by adding the MW value from the "Annual Incremental Capacity Installations by Class" chart of the Results tab for 2017 through 2025. This ensures that the embedded subsidy is aligned with the installed capacity forecast in the same time period (2017 to 2025) as the filtered cost of service results. Dividing the NPV value of the embedded subsidy by the MW of installed capacity provides the under collection of cost of service per MW of installed capacity from 2017 to 2025.

To translate this to a monthly kW fee, ORA divided the under collection of cost of service per MW of installed capacity from 2017 to 2025 by 9 (to convert to an annual value), by 12 (to convert to a monthly value) and by 1000 (to convert from MW to kW). The equation below summarizes the calculation:

$$Embedded\ Subsidy\ from\ Cell\ AS53 \div Cumulative\ Capacity\ from\ 2017\ to 2025\ in\ MW \div 9 \div 12 \div 1000 = \$\ per\ kWh\ per\ month\ ICF$$

The results of this calculation, performed on all 6 base case public tool scenarios are provided in Table 13 below

Table 13: Estimates of the Installed Capacity Fees Required to Recover the Full Cost of Service from Residential Successor Tariff Participants

Base Case Public Tool Model	NPV Value of Cost of Service Recovery Under Collection for Residential NEM Participants (2017-2025)	Cumulative Installed Residential Capacity (2017-2025)	Cost of Service Under Collection per MW	Installed Capacity Fee Needed to Recover Cost of Service Under Collection
2 Tiered High DG Value	$ 13,455,368,693	10,515	$ 1,279,582	**$ 11.85**
2 Tiered Low DG Value	$ 26,575,532,029	9,697	$ 2,740,689	**$ 25.38**
TOU 1 High DG Value	$ 15,280,386,390	9,176	$ 1,665,238	**$ 15.42**
TOU 1 Low DG Value	$ 28,352,687,246	9,477	$ 2,991,582	**$ 27.70**
TOU 2 High DG Value	$ 13,496,614,410	10,091	$ 1,337,546	**$ 12.38**
TOU 2 Low DG Value	$ 26,416,265,589	9,809	$ 2,693,133	**$ 24.94**

ORA tested the Installed Capacity Fee estimates by running a sample of base case public tool scenarios with the estimated fees. The results of this test are provided in Table 14.

Table 14: Residential Cost of Service Recovery Results for Installed Capacity Fee Estimates

			Residential Cost of Service Results with Fee Estimate			
Base Case Public Tool Model	**Installed Capacity Fee Needed to Recover Cost of Service Under Collection**		**PG&E**	**SCE**	**SDG&E**	**All IOUs**
2 Tiered Low DG Value	**$**	**25.38**	94%	106%	139%	104%
TOU 1 Low DG Value	**$**	**27.70**	96%	112%	138%	108%
TOU 2 Low DG Value	**$**	**24.94**	79%	98%	107%	92%

Upon reviewing the public tool cost of service results, ORA concludes that the estimated installed capacity fee estimates are approximately accurate but will eventually need to be estimated independently for each utility using more robust methods. Nevertheless, ORA is convinced that the installed capacity fees estimated using the analysis describe above are accurate enough to identify the approximate upper limit for capacity fees that would be needed to recover the full cost to serve successor tariff customers.

d. Aggregation of public tool adoption results to estimate the glide-path.

The main feature of ORA's proposal for the successor tariff is the gradual introduction of the ICF from $2 to $10 as the penetration of renewable generators in each utility's service area increases. ORA was advised by E3, the developers of the public tool, that the public tool was not designed to simulate user defined fee escalations.[81] ORA therefore constructed an

[81] See ED FAQ 91 http://www.cpuc.ca.gov/NR/rdonlyres/D8E05965-F612-4355-91A1-C07B45F62904/0/PublicToolQA7172015.pdf
Question: Do you have any new insights into how we can approximate a kW installed capacity fee that steps up in certain years between 2017 and 2025?
Response: User-defined escalation factors applied to rate components and NEM successor charges are not within the scope of tool functionality. The user can select to run multiple cases with different levels of kW installed capacity fees (all cases being run from 2017-2025) and then only filter for the appropriate years in each case. While any aggregation/combination of these results would be missing many interactive effects and is not equivalent to individual case results, this approximation may provide sufficient information to inform analysis.

adoption forecast that is an aggregation of public tool results from the $2, $5 and $10 /kW-month installed capacity fee scenarios. In aggregating the results ORA assumes that a 2-tiered rate structure will be the common rate for successor tariff participants for 2017 and 2018 and that successor tariff participants after 2019 will be defaulted to a TOU rate. ORA used the more conservative TOU 2 public tool results to estimate adoptions for 2019 through 2015. ORA used the cumulative successor tariff installation forecast from the regression analysis discussed in section 9.b. to determine when the $2, $5 and $10 /kW-month installed capacity fees would be in force for each utility. The schedule for rate design and ICF assumptions for each utility from 2017 to 2025 in provided in Table 15. Finally, ORA used the public tool historical adoptions from 2009 to 2016. Given these inputs and assumptions, ORA constructed low and high DG value tables of annual adoptions from 2009 to 2025 for each utility. These data are graphically displayed in Figures 16 and 17.

Table 15: Rate Design and ICF Assumptions for Aggregating Public Tool Results

Year	Rate Design	Installed Capacity Fee		
		PG&E	SCE	SDG&E
2017	2-Tiered	$ 2.00	$ 2.00	$ 2.00
2018	2-Tiered	$ 2.00	$ 2.00	$ 2.00
2019	TOU 2	$ 2.00	$ 2.00	$ 2.00
2020	TOU 2	$ 2.00	$ 2.00	$ 5.00
2021	TOU 2	$ 5.00	$ 2.00	$ 5.00
2022	TOU 2	$ 5.00	$ 2.00	$ 10.00
2023	TOU 2	$ 10.00	$ 2.00	$ 10.00
2024	TOU 2	$ 10.00	$ 2.00	$ 10.00
2025	TOU 2	$ 10.00	$ 5.00	$ 10.00

Figure 16: Aggregation of Low DG Value Adoption Assumptions (MW)

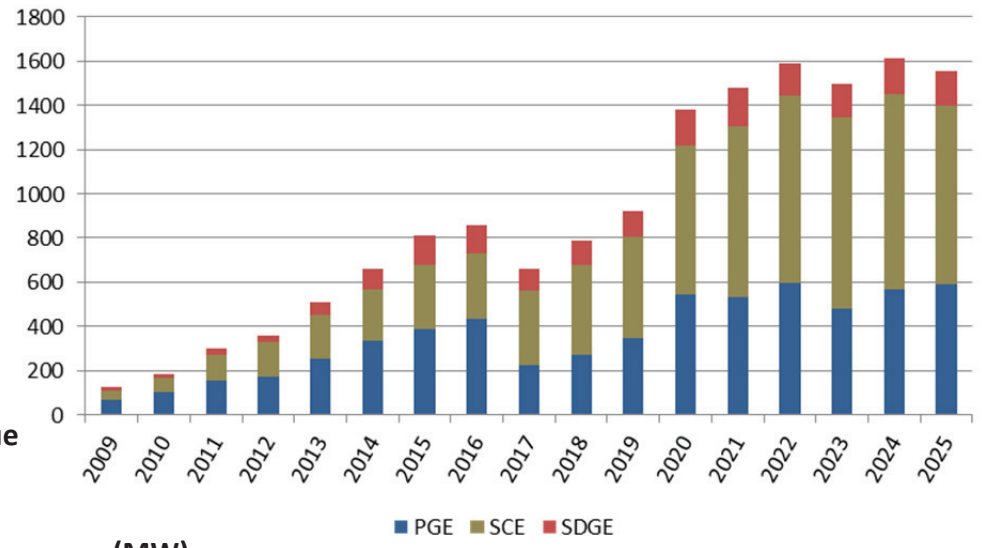


Figure 17: Aggregation of High DG Value Adoption Assumptions (MW)