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BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE CHAIRMAN	BOB STUMP COMMISSIONER	BOB BURNS COMMISSIONER
TOM FORESE COMMISSIONER	ANDY TOBIN COMMISSIONER	

IN THE MATTER OF THE APPLICAITON OF SULPHUR SPRINGS VALLEY ELECTRIC COOPERATIVE, INC., FOR A HEARING TO DETERMINE THE FAIR VALUE OF ITS PROPERTY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RETURN THEREON, TO APPROVE RATES DESIGNED TO DEVELOP SUCH RETURN AND FOR RELATED APPROVALS.	**DOCKET NO. E-01575A-15-0312** **THE ENERGY FREEDOM COALITION OF AMERICA'S NOTICE OF FILING THE DIRECT TESTIMONY OF MARK FULMER**

The Energy Freedom Coalition of America ("EFCA") hereby submits the Direct Testimony of Mark Fulmer in the above-referenced matter.

Respectfully submitted this 1st day of April, 2016.

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Attorney for Intervenor EFCA

Arizona Corporation Commission
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By: _____

1. Introduction

Q: Please state your name and business address.

A: My name is Mark E. Fulmer. I am a Principal and Co-owner at MRW & Associates, LLC (MRW). MRW is an energy consulting firm founded in 1986 that specializes in power and gas market assessments, regulatory matters, litigation support, expert witness testimony, contract review, and negotiations. My business address is 1814 Franklin Street, Suite 720, Oakland, California 94612.

Q: Please summarize your professional and educational background.

A: I have been an energy consultant with MRW since 1999. During that time, I have worked with non-utility retail energy service providers (both gas and electric), independent power producers, municipalities, end-use customers, consumer advocates, trade organizations, and financial institutions on a variety of matters related to natural gas and electric industry regulation and policy, utility ratemaking, price forecasting, demand-side management and asset valuation. Previously, I worked at Daniel, Mann, Johnson, & Mendenhall, where I consulted to utilities and others on energy efficiency. Prior to that, I worked at Tellus Institute in Boston, Massachusetts, where I consulted to numerous state agencies and non-governmental organizations on integrated resource planning and natural gas and electric industry restructuring.

I hold a Master of Science in Engineering from Princeton University and a Bachelor of Science degree in Engineering from the University of California at Irvine.

Q: Have you previously provided expert witness testimony before state public utility commissions?

A: Yes. Here in Arizona, I have provided testimony before the Arizona Corporation Commission (ACC) on behalf of The Alliance for Solar Choice (TASC) in UNS Electric's ongoing rate case, and on behalf of Constellation Energy and Direct Energy on direct access issues. Elsewhere, I have testified before state utility commissions in California, Hawaii, New Mexico, Pennsylvania, Rhode Island, and Washington. Please see Exhibit MEF-1 for my qualifications and a list of my testimonies.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Energy Freedom Coalition of America (EFCA). EFCA is committed to ensuring that current and prospective rooftop solar customers are not disadvantaged by the implementation of discriminatory and/or unfair rate design, customer classifications, or assessment of fixed charges. EFCA also fully supports retail net energy metering (NEM), which empowers customer choice by providing fair credit to homes, businesses, churches, schools, public agencies, and other neighborhood places when solar systems generate on-site energy. As such, EFCA is interested in ensuring that Sulphur Springs Valley Electric Cooperative (SSVEC or the Coop) residential rate design does not hamper customer choice.

Q: Please summarize your conclusions and recommendations.

A: My conclusions and recommendations are as follows:

1. I agree with ACC Staff that SSVEC should not be permitted to create a separate discriminatory class for customers who use solar distributed generation (DG) with retail net metering.
2. The rates proposed by SSVEC for residential DG customers, be they "grandfathered in" or not, would remove all the economic value from solar DG. This means that customers with existing DG systems would end up paying more on the new DG rate than they otherwise would on full service, and that a customer contemplating a new solar DG system would experience very long payback on their investment, often exceeding the expected 30 year life of the PV system.
3. I agree with ACC Staff that setting the DG "buy-back" rate at a backward looking short run cost of avoided power does not reflect the true avoided cost value provided by solar DG.
4. If the Commission chooses to implement any changes to DG rates, then existing DG customers should be permanently grandfathered into the current rate structure, including with respect to fixed charges.

Q: Please summarize SSVEC's proposal with respect to residential solar DG rates.

A: SSVEG proposes a number of major changes to its rates for residential customers with solar DG, both current and prospective. First, SSVEC proposes to incrementally increase the monthly service availability charge (MSAC) in the standard residential rate (Schedule R) from $10.25 to $25.00, phased in over four years. The Coop would also reduce the energy charges in the four subsequent phases to generate revenues equal to those in Phase 1. Second, SSVEC proposes to institute a new rate (Schedule R-DG E)

for customers with distributed generation (DG) systems in place on or before April 15, 2015. This rate would include a MSAC that increases from $10.25 to $50.00 phased in over four years, and energy charges that would be fixed at the existing Residential (Schedule R) rate, which includes the wholesale power cost adjustment (WPCA)). Third, SSVEC would create a new rate for customers installing DG systems after April 15, 2015 (Schedule R-DG). This rate would include the same MSAC as the Schedule R-DG E rate and include energy charges which would decrease over each phase "to provide a cost-based rate…which compensates for excess distributed generation energy at the cooperative's avoided cost."[1]

The phase-in of these rates is summarized in Tables 1 and 2, below.

Table 1: Proposed Monthly Service Availability Charges ($)

	Existing	Phase 1	Phase 2	Phase 3	Phase 4
Schedule R	10.25	15.00	18.00	22.00	25.00
Sched. R-DG E	10.25	25.00	33.00	40.00	50.00
Sched. R-DG	10.25	25.00	33.00	40.00	50.00

Table 2: Proposed Energy Charges ($/kWh)

	Existing	Phase 1	Phase 2	Phase 3	Phase 4
Standard	0.119768	0.117518	0.112858	0.106764	0.102038
DG - Grandfathered	0.119768	0.119768	0.119768	0.119768	0.119768
DG - New	0.119768	0.107617	0.095467	0.083316	0.071165

[1] Pre-Filed Direct Testimony of David Hedrick on Behalf of Sulphur Springs Valley Electric Cooperative, Inc., August 31, 2015 (Hedrick), at 28

Q: What alternative does the ACC Staff recommend instead of SSVEC's proposed separate Residential and Residential DG rate schedules?

A: The ACC Staff recommends that SSVEC's proposed Schedule R-DG E and R-DG be denied, and that all DG customers remain on Schedule R.[2] The ACC Staff also proposes slightly different final Schedule R rates than SSVEC, as shown in Table 3 below. Note that the proposed rates shown below are the final rates proposed for approval in this proceeding; SSVEC proposes to phase in these rates over four years, while the ACC Staff proposes to phase in these rates over two years.[3]

Table 3: SSVEC and ACC Staff Final Proposed Rates (after full phase-in)[4]

	SSVEC Schedule R	SSVEC Sched. R-DG E	SSVEC Sched. R-DG	ACC Staff
Fixed ($/month)	$25.00	$50.00	$50.00	$27.00
Energy ($/kWh)	$0.102038	$0.119768	$0.071165	$0.100028

2. SSVEC should not treat DG customers as a separate class or as a sub-class

Q: How has SSVEC proposed to classify Residential DG customers in its Rate Application?

A: SSVEC has proposed to introduce a new customer class for Residential Service customers with Distributed Generation.[5]

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[2] Direct Rate Design Testimony of Eric Van Epps (Van Epps) at 8.
[3] Direct Rate Design Testimony of Ranelle Paladino (Paladino) at 11.
[4] Paladino at 11-14.

Q: Why has SSVEC proposed a new Residential DG customer classification?

A: SSVEC states that "since implementing its Net Metering Tariff Schedule NM, SSVEC has experienced a dramatic increase in the number of customers installing rooftop solar photovoltaic (PV) systems, the most common form of distributed generation (DG). The proliferation of PV systems in SSVEC's service territory has caused a large increase in unrecovered fixed costs attributable to the Cooperative's net metered members."[6]

Q: Why does SSVEC believe that increasing solar PV adoption in its territory has caused a large increase in unrecovered fixed costs?

A: SSVEC witness Hedrick states, "A customer that installs distributed generation facilities will reduce the energy (kWh) that is purchased from the Cooperative by an amount equal to the generation output of their facility. This reduction in kWh purchased from the cooperative results in a loss of fixed costs being recovered through the energy component of the rate."[7]

Q: Are distributed generation customers the only residential customer types who may use less energy (fewer kWh) than the average residential customer?

A: No. As discussed in more detail below, several customer types exhibit usage characteristics that are similar to customers who install distributed generation.

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[5] Application of Sulphur Springs Valley Electric Cooperative, Inc. for a Hearing to Determine the Fair Value of its Property for Ratemaking Purposes, to Fix a Just and Reasonable Return Thereon, to Approve Rates Designed to Develop Such Return and for Related Approvals (Application), p. 4.
[6] Pre-Filed Direct Testimony of Creden W. Huber on Behalf of Sulphur Springs Valley Electric Cooperative, Inc., August 31, 2015 (Huber), p. 5.
[7] Hedrick at 11.

Q: How would SSVEC's proposed Residential DG classification differentiate these customers from standard Residential customers?

A: SSVEC's proposed Residential Distributed Generation rate classification would introduce new rate schedules, R-DG E and R-DG, which would apply specifically to residential customers who have installed, or in the future install, distributed generation. Customers on these rate schedules would be billed based on different base rates than standard Residential customers, including fixed charges that will ultimately be twice those charged to standard Residential customers.[8] R-DG customers would pay a fixed charge of $50/month compared to standard Residential customers' fixed charge of $25, if SSVEC's new proposed rate schedules and rate increases are fully implemented.[9]

Q: Does SSVEC propose to create a separate rate schedule for any sub-classes of residential customers other than DG?

A: No. Despite the fact that other residential customers take actions that change their demands on the distribution system, SSVEC treats these residential customers as being fundamentally the same. These actions include installing energy efficiency measures, participating in demand response programs, and installing non-electric appliances, or changing life circumstances (e.g., change in job hours, family members leaving, relegating the house to a vacation home, etc). Singling out DG customers by subjecting them to a separate tariff is not reasonable.

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[8] Application, at 4.
[9] Application, at 4.

Q: Has the Arizona Corporation Commission (ACC) staff addressed the differentiation of a sub-set of Residential customers?

A: Yes. The ACC Staff "is very much opposed to a $50 customer charge and does not believe it is necessary to have a separate Schedule for new and existing DG customers."[10]

Q: Does the ACC Staff believe that residential distributed generation customers are the only sub-class of residential customers that may have different usage profiles than the average residential customer?

A: No. The ACC Staff notes that "there are a number of customer segments that operate in a fashion similar to DG customers"[11] and that "[v]ariations in usage among customers in the same class have increased for a number of reasons (including seasonal customers, vacant homes, and distributed generation)."[12] Notably, the ACC Staff further elaborates that, for example, "seasonal customers may only occupy their homes for 2-3 months a year. In this instance, these customers may or may not be covering their fixed costs and may be contributing to the utility's under-recovery."[13]

As I noted above, customers who take significant measures to reduce electricity usage, either by reducing overall energy usage or converting to natural gas appliances similarly may have significantly different usage profiles than SSVEC's average residential customers. Thus, there are variations in electricity usage across the residential

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[10] Van Epps at 8.
[11] Van Epps at 10.
[12] Paladino at 6.
[13] Van Epps at 10.

customer class, and it does not make sense to differentiate a single sub-class with regard to rate design.

3. Should the ACC modify the residential customer classes, grandfathering of DG customers is required

Q: Does SSVEC propose to treat existing DG customers differently that new ones?

A: Yes. SSVEC proposes that any customer whose DG application was filed prior to April 15, 2015 should be allowed to remain on a net metered tariff; i.e., "grandfathered" onto the "R-DG E" tariff.[14] This, along with the revised Net Metering Tariff Schedule NM-1 would grandfather these customers for twenty years from the date of the customers' DG system installation; compensate customers for DG energy at the full retail energy rate; and allow banking of excess kilowatt-hours from month to month with an annual true-up. Any kilowatt-hours remaining at the time of the true-up would be compensated at the Coops Annual Average Avoided cost per Schedule NM-1 (approximately 3¢/kWh).

Q: Should existing DG customers remain on a rate which allows for full retail rate compensation and month-to-month banking?

A: Yes. Arizonans served by SSVEC made substantial investments in solar DG, in part due to the state and Coop's financial encouragement to do so. For example, the Renewable Energy Standard (RES) established in 2007 requires 15 percent of retail energy sales from ACC–regulated electric utilities to come from renewable energy resources by the

[14] Huber at 7.

year 2025. The rules further require that 30 percent of that renewable amount come from distributed energy resources (distributed Energy resources are installed on the customer's premises to offset customer load). Half of the distributed energy or customer–owned requirement must be met by systems among residential customers. In support of this program, the ACC required SSVEC (and other regulated electric utilities) to provide financial incentives to Arizonans who installed solar DG. The State also provides up to $1,000 tax credit on new solar DG installations.

The Commission should recognize that existing NEM customers have made long-term commitments to DG systems in reliance on existing rates and with the encouragement of the State, which requires customers to interconnect under the NEM tariff. The ACC in its only opportunity to date to rule on grandfathering, rejected Arizona Public Service's request to apply new solar fees retroactively, and instead imposed the fees on new solar users starting 30 days after the order was issued.[15]

Q: Do you have any concerns with SSVEC's proposed R-DG E tariff in this regard?

A: Yes. Even though the Coop proposes to continue net metering for existing DG customers, it is proposing to increase the MSAC from the current $10.25 up to $50 in four steps over four years.[16] Besides being inappropriate to charge residential customers with DG a fixed monthly charge twice that of a residential customer with standard Coop serviced (as described in Section 5 of my testimony), it would also have a profoundly negative impact

[15] ACC Decision 74202 at 29.
[16] Hedrick at 16

on the economics of those residential Coop members who have already installed solar DG.

Furthermore, the April 15, 2015 cutoff date is completely arbitrary. SSVEC did not even file its application requesting the new rates until August 31, 2015. Major changes in policies and rates such as the imposition of Schedule R-DG and R-DG E should not be made retroactive. The Commission, with regards to the APS case, was correct when it held off any rate change until after it had fully ruled on the matter. Were the Commission to allow different rates for DG customers, then it should follow its own precedent and grandfather any existing solar DG customers onto standard residential rates.

The bottom line is that it is unreasonable to change price structures and materially harm customers who made good-faith investments in DG, especially since that customer was encouraged to do so by SSVEC and the State of Arizona. I recommend that the ACC reject SSVEC's proposed MSAC under the R-DG tariff and keep DG customers' rates consistent with the standard residential class rate.

Further, while I am not an attorney, EFCA intends in its brief to make a clear case that this proposal violates Section R14-02-2305 of the Commission Rules which prohibits discriminatory charges against net metered customers.

4. The benefits of solar are not considered in proposed export rate

Q: You note that SSVEC proposes to have new residential solar DG customers be compensated for any power exported to the grid at an "export rate" rather than

banked and credited at effectively the retail rate. What specifically does SSVEC propose?

A: The Coop proposes to compensate all excess distributed generation energy at its Annual Average Avoided Cost, as defined in Net Metering Tariff Schedule NM-1.[17]

Q: What is the Annual Average Avoided Cost?

A: The Annual Average Avoided Cost is the "average wholesale fuel and energy cost per kWh charged by the Cooperative's wholesale power supplier(s) during the previous 12 months calculated with the receipt of the May wholesale power bills."[18]

Q: What is the value of the Annual Average Avoided Cost?

A: Per the Application, this Annual Average Avoided Cost for SSVEC would equal $0.0258/kWh.[19]

Q: Is this a reasonable export rate?

A: No. While the export rate is labeled "avoided cost," I do not believe that it is. Avoided cost should be forward looking. Per the Arizona NEM Rules, "Avoided Costs" means the incremental costs to an Electric Utility for electric energy or capacity or both which, but for the purchase from the Net Metering Facility, such utility would generate itself or purchase from another source."[20] Instead, the proposed export rate would be based

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[17] Huber at 8.
[18] Schedule NM-1 (Application attachment)
[19] Schedule NM-1 (Application attachment)
[20] R14-2-2302

backward-looking: the rate charged by the Coop's wholesale provider(s) during the prior 12 months. This clearly is not consistent with the notion of avoided costs.

Second, the proposed avoided cost export rate is very short-sighted and does not reflect the long-run avoided cost—and value—that solar DG provides to SSVEC.

Q: What elements should be considered when compensating solar DG users when they provide power back to the grid?

A: I believe that the utility must consider a full range of costs that can be avoided by solar DG. For example, in the recent UNSE rate case I testified that when I considered the full suite of benefits that solar DG can provide, the proper "avoided cost" or "value of solar" for that utility was on the order of 9.5¢ to 14¢ per kilowatt-hour.[21] In arriving at that value, I considered six elements taken from the 2014 UNS Electric Integrated Resource Plan (IRP):

1. **Avoided energy**: Avoided energy is the variable cost of power plants that is avoided due to the effective load reductions provided by solar DG. They can be calculated assuming a specific proxy power plant (e.g., a combustion turbine) or using forward looking wholesale market prices. This is the only element that SSVEC includes in its avoided cost.
2. **Avoided generation capacity:** Avoided generation capacity cost is value of the forgone or deferred power plants caused by the load reduction provided by solar DG.

[21] Docket No. E-04204A-15-0142, Surrebuttal of Mark Fulmer For The Alliance for Solar Choice, at 30-40.

3. **Avoided transmission costs**: Avoided transmission cost is value of the forgone, deferred or downsized transmission investments caused by the load reduction provided by solar DG.
4. **Avoided distribution costs:** Avoided distribution cost is value of the forgone, deferred or downsized distribution investments caused by the load reduction provided by solar DG.
5. **Avoided greenhouse gas (GHG) emissions costs**: Avoided GHG emissions costs are the emissions associated with the reduced output of the marginal power plants which set the avoided energy cost. These emissions are multiplied by an assumed carbon dioxide (CO_2) cost ($/metric ton) to arrive at the avoided greenhouse gas cost.
6. **Incremental integration costs**: Even with geographic diversity, there is a cost to integrate solar DG into the grid. These integration costs cover the incremental ancillary services to support the added solar generation.

For completeness, I also discussed and provided estimated values for avoided environmental externalities. Like with avoided greenhouse gas emissions costs, solar DG can reduce criteria air pollutant (NO_x, SO_x and fine particulate matter) emissions associated with the reduced output of the marginal power plants which set the avoided energy cost. I also included the estimated marginal cost of water. Given the arid climate of Arizona and the increasing demand for water in the Southwest, including the marginal cost of water (i.e., the cost of water reclamation or desalinization) is appropriate.

Q: What did you conclude from your value of solar analysis?

A: I concluded that the levelized value of solar (9.5-14¢/kWh) "is relatively close to UNSE's average residential rate, indicating that in the long run, full-service customers would be held neutral and, in fact, could even receive a net benefit by continuing current net metering policies."[22]

Q: Do you think this conclusion is applicable here, too?

A: While many details of SSVEC's system differ from UNS electric, I believe that were I to conduct an analogous analysis, my conclusion would be similar.

Q: What does Staff state concerning the export rate?

A: First, ACC Staff opposes annual updates to export rate and instead recommends that it be updated every three years. Second, Staff recommends that export credit rate be higher than utility "avoided cost" but lower than the retail rate. It further recommends that it be based on value of DG docket.

5. SSVEC's proposed DG rates are inadequate

Q: Did you analyze the economic effect of SSVEC's proposed residential rates for DG customers?

A: Yes. I found SVEC's proposal renders solar not cost-effective for residential customers. First, the proposed variable electric rate in Phase 4, 7.1¢/kWh, is lower than the typical solar lease rate of 9¢/kWh. This means that a customer using a no upfront-cost lease

[22] Docket No. E-04204A-15-0142, Surrebuttal of Mark Fulmer For The Alliance for Solar Choice, at 3.

would experience negative cash flow from day one. This is regardless of whether the proposed buyback rate is approved or not; even with simple net metering, it does not work. Second, if a customer purchases a solar system for their home, it would not pay back in a reasonable amount of time. Again, this clearly indicates that the proposed rate will simply not work.

Q: Please describe how you came to this conclusion.

A: In the UNS Electric rate case (Docket No. E-04204A-15-0142), Arizona Public Service introduced a spreadsheet model to evaluate the costs and benefits of rooftop solar from a customer perspective. Various parties, including ACC Staff and TASC, used this model with refined inputs to evaluate UNS's proposal. For my analysis here, I input the proposed Phase 1 and Phase 4 SSVEC rates into the model, along with the solar PV output profile for Bisbee.

Q: What are your basic input assumptions?

A: First, I used the Phase 1 and Phase 4 proposed rates from SSVEC's application for both full service (Schedule R) and those with solar DG (schedules R-DG and R-DG E). Second, I used the solar system size (5.62 kW) and approximate output (1,013 kWh) from Mr. Hedrick's testimony.[23] As noted above, for the alternative I assumed the solar output profile for a south-facing panel in Bisbee, per the National Renewable Energy Laboratory's online tool, PV Watts. These data suggest that the solar output Mr. Hedricks

[23] Hedricks at 9.

used—a capacity factor of 25%[24]—was excessive. That is, he assumed a more efficient solar panel than NREL. I also adjusted the model's default degradation factor (how much output it loses with age) from 0.25% to 0.5%. I also added an annual maintenance cost of $21 per kilowatt per year.[25] Last, I adjusted the assumed cost of the system up from that used by Mr. Liu in the UNSE rate case ($2,750/kW)[26] to the value presented in a recent Lawrence Berkeley National Laboratory (LBNL) study, which I had also used in my UNSE Testimony ($3,600/kW).[27]

These and other assumptions are summarized in Table 4.

Table 4. Assumptions for Economics of Solar DG Analysis

	SSVEC Solar Performance, Staff Costs	Adjusted Solar Performance, Staff Costs	Adjusted Solar Performance, TASC Costs
Location	Bisbee	Bisbee	Bisbee
Average Customer Use, kWh	1,285	1,285	1,285
Solar Size (DC), kW	6.6	7.3	7.3
Solar Size, (AC), kW	5.3	6.3	6.3
Degradation, % per year	0.25%	0.5%	0.5%
Maintenance Cost, $/year	0	$21/kW	$21/kW
Ave. 1st Year monthly solar output	1,028	1,028	1,028
Solar Cost, $/kW DC	$2,750	$2,750	$3,600
Solar Lease Rate, ¢/kWh	9.0[28]	9.0	9.0
SSVEC and Lease rate escalation rate	3.17%	3.17%	3.17%
User discount rate	7.2%	7.2%	7.2%

[24] *Ibid.*
[25] NREL, Distributed Generation Renewable Energy Estimate of Costs, http://www.nrel.gov/analysis/tech_lcoe_re_cost_est.html
[26] E-04204A-15-0142, Yue Liu Subrebuttal Testimony (Liu) at 7
[27] Lawrence Berkeley National Laboratory, Tracking the Sun VIII, August 2016, p. 32
Note also this is consistent with the NREL data source from which I took the operating and maintenance cost.
[28] Liu at 7. Evidence that lease rates are in fact higher than this was presented in E-04204A-15-0142

Q: Why did you use a discounted payback as a metric to evaluate the economics of purchasing a solar system?

A: A discounted payback is the number of years it would take for an investment in solar PV to pay off in comparison to an investment with a return equal to the discount rate. In this way, it accounts for the opportunity cost and time value of money. Thus, if the discounted payback is the life of the asset, approximately 30 years, then the customer would be indifferent between making an investment in solar versus an investment of similar risk with a life of 30 years at the assumed discount rate. If the discounted payback is less than the life of the asset, then compared to the alternative investment, solar is favorable. If not, then the solar investment is not favorable.

Q: What did this analysis find?

A: My analysis is summarized in Table 5. The table shows three columns. The first column shows the results with the SSVEC solar performance assumptions plus the remaining default assumptions made by ACC Staff Liu in the UNSE rate case. The second column shows results with the performance assumption changed I describe above. The third column shows the results with the adjusted solar assumptions plus the higher solar system cost.

The top half of the table shows the results for customers who have existing solar DG systems (i.e., are grandfathered into the current energy rates plus the increasing monthly charge); the bottom half shows the results for customers who might install solar DG in the future.

The results sections show four metrics:

- The annual customer savings with a solar lease of 9¢/kWh.
- The "breakeven" lease rate. That is, the minimum lease rate that would generate positive cash flows.
- The discounted payback for a customer who directly invested in as solar DG system.

As the table shows, the results for grandfathered customers are poor from the start. In the Phase 1 year, a 9¢/kWh lease would still result in a loss of about $90. By the time the Phase 4 rates are in effect, the results are worse: the customer on a 9¢/kWh lease would now be paying $239 more with the solar system per year than on taking full service from SSVEC under the standard Schedule R rate.

As the bottom half of the table (the Schedule R-DG rates) shows, the Phase 1 rates would generate first-year savings of over $500 with the 9¢/kWh lease and a discounted payback of less than 15 years. However, the results change dramatically by the time the Phase 4 rates would be in effect. Leases would have to be offered at 5.6¢/kWh or less in order to be economic, which is well below what solar providers currently offer. If a customer purchases a system, even with the optimistic assumption set (first column) the discounted payback would be greater than the life of the system.

Q: What does your analysis mean for solar customers?

A: First, a customer with an existing solar lease will very likely have higher total electricity bills with the PV than without it. Second, the poor up-front economics will likely dramatically reduce, if not eliminate, future investment in solar DG in the SSVEC territory.

1 **Table 5. Economics of Solar DG Under SSVEC Propsoal**

	SSVEC Solar Performance, Staff Costs	Adjusted Solar Performance, Staff Costs	Adjusted Solar Performance, TASC Costs
Grandfathered Results (DG-E)			
Phase 1			
Ave. Annual Savings (cost), Lease*	($89)	($89)	($89)
Break-even lease rate, c/kWh	$0.083	$0.083	$0.083
Phase 4			
Ave. Annual Savings (cost), Lease*	($239)	($239)	($239)
Break-even lease rate, c/kWh	$0.083	$0.071	$0.071
New System Results (DG)			
Phase 1			
Ave. Annual Savings (cost), Lease*	$565	$565	$565
Break-even lease rate, c/kWh	$0.136	$0.136	$0.136
Discounted Payback (years), Purchase	13.2	22.8	>30
Phase 4			
Ave. Annual Savings (cost), Lease*	($423)	($423)	($423)
Break-even lease rate, c/kWh	$0.056	$0.056	$0.056
Discounted Payback (years), Purchase	>30	>>30	>>30

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4 **Q: How does SSVEC's proposal impact rates for residential customers with and**

5 **without solar DG?**

6 A: Table 6 below shows the average bill changes for residential customers, as presented by

7 SSVEC. For those under full service Schedule R rates, the modest 3.5% increase in

8 Phase 1 is followed by negligible decreases in the following phases. For the customers

9 with DG, the increases start at 33.3% or 40.6%, and increase at rates in the double-digits

10 in each of the following phases (but for the DG rate in Phase 3). Not only are the

11 increases for DG customers greater on a percentage basis, but on an absolute basis, too.

The total increase for the average full-service residential customer is (through Phase 4) less than $2.75 per month, while the "grandfathered" DG customer would have an average bill increase of nearly $50. A customer with a new DG system would be paying SSVEC $30 more per month than they would have had the current rates remained in effect. These are obviously very large impacts on a single segment of the residential class. I have difficulty imaging a commission approving a rate change that increase the average residential customer's rates by nearly $600 per year ($50/month), but that is indeed what SSVEC is requesting for customers with solar DG.

Table 6. Comparison of Average Residential Monthly Bill Change from Prior Phases (as presented in SSVEC's application)[29]

	Standard Residential	DG-E (Grandfathered)	DG (New)
Phase 1	+$3.22 (+3.5%)	+$14.75 (+40.6%)	+$12.10 (+33.3%)
Phase 2	-$0.18 (-0.2%)	+$8.00 (+15.6%)	+$5.35 (+11.1%)
Phase 3	-$0.16 (-0.2%)	+$7.00 (+11.8%)	+$4.35 (+8.1%)
Phase 4	-$0.22 (-0.2%)	+$10.00 (+15.1%)	+$7.35 (+12.6%)
Total	+$2.72	+$49.75	+$29.15

Q: Does SSVEC's customer communication on the rate, as presented in CWH-1, confirm these impacts?

A: No. The notification of the proposed rate changes, Attachment CWK-1 to Mr. Huber's testimony, states:

> If you installed a system or submitted an interconnection request prior to April 15, 2015, SSVEC is proposing that these systems be grandfathered

[29] Exhibit H-4.01 to H-4.03.

> for 20 years from the date of activation. **So you keep the deal you now have.** (Emphasis added)

While the per kilowatt-hour charges won't change under SSVEC's proposal, to suggest that existing DG customers will "keep the deal" that they have is not consistent with a nearly $600 per year increase in SSVEC bills.

6. ACC Staff's preference for a three-part rate should be disregarded

Q: What does the ACC Staff say about rate design?

A: Consistent with the testimonies in the UNS Electric Rate Case, the Staff states that it would prefer to implement a mandatory three-part rate for residential and small commercial customers served by SSVEC.[30] Staff does not make that recommendation here because SSVEC lacks the metering infrastructure to implement such a rate.[31]

Q: What is a three-part rate?

A: A three-part rate is one in which a customer is billed on three elements: a fixed, per customer charge analogous to SSVEC's monthly service availability charge; a per kilowatt-hour charge for electricity consumed; and a per kilowatt demand charge based upon the customer's peak usage during a prescribed length of time (e.g., 15 minutes).

Q: Do you agree with Staff's preference for a three-part rate?

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[30] Epps at 3.
[31] Paladino at 7.

1 A: No. While I agree that SSVEC appears to lack the underlying infrastructure to implement
2 a three-part rate, as I testified in the UNS Electric rate case, I cannot recommend it for
3 residential customers even if the technology to do so was in place.
4
5 **Q: Can you summarize your reasons for opposing a three-part rate?**
6 A: Yes. As I noted in my UNSE rate case testimony, a three-part rate is "not ready for prime
7 time." There, I noted the recent Regulatory Assistance Project paper urging "great
8 caution" in designing residential demand charges.[32] In particular, I testified that there is
9 currently no foundation for UNSE to impose a mandatory three-part time-of-use (TOU)
10 rate on residential customers. I pointed out that there has been only a smattering of opt-in
11 pilot programs testing residential customer understanding of and response to demand
12 charges and to my knowledge no utility has yet implemented mandatory residential
13 TOU.[33] No party in that proceeding provided evidence that residential customers
14 generally understand demand charges and will be able be able to react to the "price
15 signals" they send. Additional controlled studies are needed to ascertain how much
16 customers would actually understand about demand charges. Additional affordable tools
17 need to be in place for customers to meaningfully react to demand charges and TOU
18 before the ACC contemplates implementing such a rate.
19 **Q: Does this conclude you direct testimony?**
20 A: Yes.

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[32] Lazar, Jim, November 2015. "Use Great Caution in Design of Residential Demand Charges," Montpelier: Regulatory Assistance Project. Project is a nonprofit that "advises public officials on regulatory and competitive utility policies."
[33] Docket No. E-04204A-15-0142, Fulmer Surrebuttal Testimony at 2.

Exhibit MEF-1

MARK E. FULMER

PROFESSIONAL EXPERIENCE

Principal
MRW & Associates, LLC
(1999 - Present)
Conduct economic and technical studies in support of clients involved in regulatory and legislative proceedings and power project development. Advise clients on the economic issues associated with taking electricity and natural gas service from non-utility sources or self-generating power. Work includes expert testimony on rate matters; economic analysis of end-use energy-efficiency projects, retail rate and wholesale price forecasting, and pro forma analysis of cogeneration and distributed generation facilities.

Project Engineer
Daniel, Mann, Johnson & Mendenhall
(1996 - 1999)
Acted as project manager and technical advisor on energy efficiency projects. Work included management of PG&E program to promote innovative energy efficient technologies for large electricity users. Coordinated the implementation of an intranet-based energy efficiency library. Directed technical and market analyses of small commercial and residential emerging technologies.

Associate
Tellus Institute
(1990-1996)
Advised public utility commissions in five states on electric and gas industry deregulation issues. Submitted testimony on the rate design of a natural gas utility to the Pennsylvania Public Utilities Commission. Testified before the Hawaii PUC on behalf of a gas distribution utility concerning a competing electric utility's demand-side management plan. Analyzed national energy policies for a set of non-governmental agencies, including critiquing the DOE's national energy forecasting model. Developed model to track transportation energy use and emissions and used the model to evaluate state-level transportation policies. Developed model to track greenhouse gas emission reductions resulting from state-level carbon taxes.

Research Assistant
Center for Energy and Environmental Studies, Princeton University
(1988-1990)
Researched the technical and economic viability of gas turbine cogeneration using biomass in the cane sugar and alcohol industries. First researcher to apply "pinch" analysis and a mixed-integer linear programming model to minimize energy use in cane sugar refineries and alcohol distilleries.

EDUCATION

M.S.E., Mechanical and Aerospace Engineering, Princeton University, 1991
B.S., Mechanical Engineering, University of California, Irvine, 1986

SELECTED PUBLICATIONS

1. A Technical and Economic Assessment of the Co-Production of Electricity and Alcohol From Sugar Cane. Presented at the *International Engineering Conference on Energy Conversion (IECEC-90).* American Institute of Chemical Engineers. New York, NY. August 1990. Principal author and presenter.

2. Cogeneration Applications of Biomass Gasifier/Gas Turbine Technologies in the Cane Sugar and Alcohol Industries. Proceedings, *Energy and Environment in the 21st Century*, MIT Press. Cambridge, Massachusetts. 1991. Co-author.

3. The Environmental Impacts of Demand-Side Management. Electric Power Research Institute report TR-101673. 1992. Co-author.

4. The Role of Gas Heat Pumps in Electric DSM. Presented at the 6th National Demand-Side Management Conference. Miami Beach, Florida. March 1993. Principal author and presenter.

5. Applying an Integrated Energy/Environmental Framework to the Analysis of Alternative Transportation Fuels. Invited paper at the European Council for an Energy Efficient Economy (ECEEE) 1993 Summer Study. Principal author.

6. Mistakes, Misconceptions, and Misnomers in DSM Cost-Effectiveness Analysis. Peer reviewed paper at the ACEEE 1994 Summer Study. Principal author and presenter.

7. A Social Cost Analysis of Alternative Fuels for Light Vehicles. *Energy Strategies for a Sustainable Transportation System*, ACEEE. Washington, DC. 1995.

8. Strategies for Reducing Energy Consumption in the Texas Transportation Sector. Project for the Texas Sustainable Energy Development Council. Austin, Texas. June 1995. Co-author.

9. Evaluation of Food Processing Effluent Treatment Alternatives. Paper presented at the American Chemical Society meeting, Las Vegas, Nevada. December 1997. Co-Author.

10. Market Transformation Effect Indicators for Government, Utilities, Retailers and Manufacturers. Invited panelist in a roundtable discussion at the American Council for an Energy Efficient Economy (ACEEE) 1998 Summer Study.

11. California: Crisis Over? Project Finance NewsWire, Chadbourne & Parke. October 2001. Co-author.

12. California: Back to Basics or Déjà Vu? Natural Gas & Electricity, Volume 20, Number 12. July 2004. Co-author.

13. Nuclear Fuel Reprocessing: Issues and Future Prospects. Report for the California Energy Commission. (Final Draft). March 2006. Co-author.

14. AB 1632 Assessment of California's Operating Nuclear Plants. California Energy Commission, CEC-100-2008-005-F. October 2008. Co-author.

15. Framework for Evaluating Greenhouse Gas Implications of Natural Gas-fired Power Plants in California. California Energy Commission, CEC-700-2009-009-F. May 2009. Co-author.

16. California's March to 50% Renewables. Project Finance NewsWire, Chadbourne & Parke. November 2015. Co-author.

PREPARED TESTIMONY

1. Rhode Island Public Utilities Commission No. 2025
   Prepared Testimony on Behalf of Rhode Island Department of Public Utilities and Carriers (Commission Staff). Testimony addressed the costs, savings, and cost-effectiveness of the proposed demand-side management programs of Providence Gas Company. April 1993.

2. Pennsylvania Public Utility Commission R-943029
   Prepared Testimony on Behalf of the Pennsylvania Office of Consumer Advocate. Testimony reviewed 1307(f) filing of Columbia Gas of Pennsylvania, particularly the impact of the proposed gas cost recovery mechanism on residential customers. May 1994.

3. Public Utilities Commission of the State of Hawaii No. 94-0206
   Prepared Testimony on Behalf of the Gas Company of Hawaii (Gasco). Testimony identification of Gasco's concerns regarding HECO's proposed DSM programs for competitive energy end-use markets. December 1994.

4. Arizona Corporation Commission No. E-00000A-02-0051, E-01345A-01-0822, E-00000A-01-0630. E01933A-02-0069, E-01933A-98-0471
   Rebuttal Testimony on Behalf of Constellation NewEnergy, Inc. and Strategic Energy, L.L.C. Testimony addressed the future of the Arizona Independent System Administrator. July 28, 2002.

5. FERC Docket Nos. EL00-95-075 and EL00-98-063
   Affidavit on Behalf of Duke Energy Trading and Marketing LLC. March 20, 2003.

6. CPUC Rulemaking 01-10-024
   Prepared Testimony on Behalf of the Alliance for Retail Energy Markets. Testimony addressed the utility procurement plans with respect to resource adequacy. June 23, 2003.

7. CPUC Rulemaking 01-10-024
   Rebuttal Testimony on Behalf of the Alliance for Retail Energy Markets. July 14, 2003.

8. Arizona Corporation Commission No. E-00000A-02-0051
   Reply Testimony on Behalf of Constellation NewEnergy, Inc. and Strategic Energy L.L.C. August 29, 2003.

9. Arizona Corporation Commission No. E-01345A-03-0437
   Direct Testimony on Behalf of Constellation NewEnergy and Strategic Energy, Inc. February 3, 2004.
10. Arizona Corporation Commission No. E-01345A-03-0437
    Cross Rebuttal Testimony of Mark E. Fulmer on Behalf of Constellation NewEnergy and Strategic Energy, Inc. March 30, 2004.

11. CPUC Rulemaking 03-10-003
    Direct Testimony of Mark E. Fulmer on Behalf of The City and County of San Francisco on Community Choice Aggregation Transaction Costs. April 15, 2004.

12. CPUC Rulemaking 03-10-003
    Reply Testimony of Mark E. Fulmer on Behalf of The City and County of San Francisco on Cost Responsibility Surcharge for Community Choice Aggregation. May 7, 2004.

13. CPUC Rulemaking 03-10-003
    Rebuttal Testimony of Mark E. Fulmer on Behalf of The City and County of San Francisco on Cost Responsibility Surcharge for Community Choice Aggregation. May 20, 2004.

14. CPUC Rulemaking 04-04-003
    Testimony of Mark Fulmer on Behalf of Strategic Energy LLC and Constellation NewEnergy concerning the Long Term Procurement Plans of PG&E, SCE and SDG&E. August 6, 2004.

15. CPUC Rulemaking 04-04-003
    Rebuttal Testimony of Mark Fulmer on Behalf of Strategic Energy LLC and Constellation NewEnergy concerning the Long Term Procurement Plans of PG&E, SCE and SDG&E. August 20, 2004.

16. CPUC Rulemaking 03-10-003
    Opening Testimony of Mark E. Fulmer on Behalf of the City and County of San Francisco on Allocation of Costs for Community Choice Aggregation Phase 2. April 28, 2005.

17. CPUC Rulemaking 04-12-014
    Testimony of Mark E. Fulmer on Behalf of the Alliance for Retail Energy Markets Concerning SCE's Test Year 2006 General Rate Case Application. May 6, 2005.

18. CPUC Rulemaking 03-10-003
    Rebuttal Testimony of Mark E. Fulmer on Behalf of the City and County of San Francisco on Allocation of Costs for Community Choice Aggregation Phase 2. May 16, 2005.

19. CPUC Rulemaking 04-12-014
    Testimony of Mark E. Fulmer on Behalf of the Alliance for Retail Energy Markets Concerning SCE's Test Year 2006 General Rate Case Application. May 25, 2005.

20. CPUC Application 06-03-005
    Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition Concerning Phase 2 of the PG&E's 2007 General Rate Case Marginal Cost, Revenue Allocation and Rate Design. October 27, 2006.

21. CPUC Application 07-01-045
Testimony of Mark E. Fulmer on Behalf of The Alliance for Retail Energy Markets and The California Manufacturers and Technology Association Concerning SCE's Application to Update is Direct Access and Other Service Fees. June 22, 2007.

22. CPUC Rulemaking 08-03-002
Testimony of Mark Fulmer Behalf of Debenham Energy, LLC. Concerning Tariffs Supportive of Green Distributed Generation. October 31, 2008.

23. CPUC Application 09-02-022
Testimony of Mark E. Fulmer on Behalf of The Direct Access Customer Coalition Concerning PG&E's 2009 Rate Design Window Application. July 31, 2009.

24. CPUC Application 09-02-019
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition Concerning the Cost Recovery Proposed By PG&E in its Application to Implement a Photovoltaic Program. August 14, 2009.

25. Superior Court of San Francisco
Deposition of Mark E. Fulmer on Behalf of the City and County of San Francisco in PG&E v. CCSF. (Verbal deposition only.) September 2, 2009.

26. California Superior Court of San Francisco Court Case No. CGC-07-470086 Testimony of Mark E. Fulmer on Behalf of the City and County of San Francisco in PG&E v. City and County of San Francisco. (Trial exhibits only in electronic file.) September 25, 2009.

27. CPUC Application 09-12-020
Testimony of Mark E. Fulmer on Behalf of The Direct Access Customer Coalition Concerning Phase 1 of PG&E's Test Year 2011 General Rate Case. May 19, 2010.

28. CPUC Application 10-03-014
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition Concerning Phase 2 of PG&E's Test Year 2011 General Rate Case Application. October 6, 2010.

29. CPUC Rulemaking 07-05-025
Testimony of John P. Dalessi, Mark E. Fulmer, Margaret A. Meal on Behalf of the Joint Parties on a Fair and Reasonable Methodology to Determine the Power Charge Indifference Adjustment (PCIA) and the Competition Transition Charge (CTC). January 31, 2011.

30. CPUC Rulemaking 07-05-025
Testimony of Mark E. Fulmer on Behalf of the Direct Access Parties Concerning the Transitional Bundled Service Rate, Direct Access Switching Rules, Minimum Stay Provisions, and Energy Service Provider Financial Security Requirements. January 31, 2011.

31. CPUC Rulemaking 07-05-025
Rebuttal Testimony of Mark E. Fulmer on Behalf of The Direct Access Parties Concerning the Transitional Bundled Service Rate, Direct Access Switching Rules, Minimum Stay Provisions, and Energy Service Provider Financial Security Requirements. February 25, 2011.

32. CPUC Rulemaking 07-05-025
Rebuttal Testimony of John P. Dalessi, Mark E. Fulmer, Margaret A. Meal on Behalf of The Joint Parties on a Fair And Reasonable Methodology to Determine the Power Charge Indifference Adjustment (PCIA) and the Competition Transition Charge (CTC). February 25, 2011.

33. CPUC Application A.11-03-001, 11-03-002, 11-03-003
Testimony of Mark E. Fulmer on Behalf of The Direct Access Customer Coalition and The Alliance for Retail Energy Markets Concerning Competitive Issues in the 2012-2014 Demand Response Program Proposals. June 15, 2011.

34. CPUC Application 11-03-001, 11-03-002, 11-03-003
Rebuttal Testimony of Mark E. Fulmer on Behalf of The Direct Access Customer Coalition and The Alliance for Retail Energy Markets Concerning Competitive Issues in the 2012-2014 Demand Response Program Proposals. July 11, 2011.

35. CPUC Application 11-06-004
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition and the Alliance for Retail Energy Markets concerning PG&E's 2012 Energy Resource Recovery Account (ERRA) and 2012 Generation Non-bypassable Charges Forecast. August 26, 2011.

36. CPUC Application 11-05-023
Testimony of Mark Fulmer on Behalf of the Direct Access Customer Coalition, the Alliance for Retail Energy Markets and the Western Power Trading Forum concerning the Application of SDG&E for Authority to Enter into Purchase power Tolling Agreements with Escondido Energy Center, Pio Pico Energy Center, and Quail Brush Power. September 22, 2011.

37. CPUC Application 11-06-007
Testimony of Mark Fulmer on Behalf of the Direct Access Customer Coalition Concerning Phase 2 of SCE's Test Year 2012 General Rate Case Application. February 6, 2012.

38. CPUC Application 11-12-009
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition, the Alliance for Retails Energy Markets and the City and County of San Francisco Concerning PG&E's Application to Revise Direct Access and Community choice Aggregation Service Fees. May 14, 2012.

39. CPUC Rulemaking 12-03-014
Testimony on Behalf of the Alliance for Retail Markets, Direct Access Customer Coalition, and Marin Energy Authority. With Sue Mara. June 25, 2012.

40. CPUC Rulemaking 12-03-014
Reply Testimony on Behalf of the Alliance for Retail Energy Markets, Direct Access Customer Coalition, and Marin Energy Authority. With Sue Mara. July 23, 2012.

41. CPUC Application 12-03-001
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets Concerning PG&E Company's Application to Implement Economic Development Rates for 2013-2017. August 24, 2012.

42. CPUC Application 12-02-001
Rebuttal Testimony of Mark E. Fulmer on Behalf of the Alliance for Retail Energy Markets Concerning PG&E's Application to Implement Economic Development Rates for 2013-2017. October 19, 2012.

43. CPUC Application 12-04-020
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets, the Direct Access Customer Coalition and 3 Phases Renewables Regarding PG&E's Application to Establish a Green Option Tariff. October 19, 2012.

44. CPUC Application 12-04-020
Rebuttal Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets, the Direct Access Customer Coalition and 3 Phases Renewables Regarding PG&E's Application to Establish a Green Option Tariff. November 9, 2012.

45. CPUC Application 11-11-002
Testimony of Mark Fulmer on Behalf of the City of Long Beach. November 16, 2012.

46. CPUC Application11-11-002
Rebuttal Testimony of Mark Fulmer on Behalf of the City of Long Beach. December 14, 2012.

47. CPUC Investigation 12-10-013
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition Regarding the Rate Treatment of the San Onofre Nuclear Generating Station. September 10, 2013.

48. CPUC Application 13-06-015
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition Regarding SDG&E's Application for Approval of an Amended Power Purchase Tolling Agreement with Pio Pico Energy Center. September 20, 2013.

49. CPUC Investigation12-10-013
Rebuttal Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition Regarding the Rate Treatment of the San Onofre Nuclear Generating Station. September 23, 2013.

50. CPUC Application 13-06-015
Rebuttal Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition Regarding SDG&E's Application for Approval of an Amended Power Purchase Tolling Agreement with Pio Pico Energy Center. October 4, 2013.

51. CPUC Application 13-08-004
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition Regarding the SCE's 2014 "ERRA" Forecast. November 20, 2013.

52. CPUC Application 13-06-011
Testimony of Mark Fulmer on Behalf of the Core Transport Agent Consortium Concerning PG&E's Core Gas Capacity Planning Range. November 20, 2013.

53. CPUC Application 13-04-012
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition Concerning Phase 2 of PG&E's Test Year 2014 General Rate Case Application. December 13, 2013.

54. CPUC Application 13-06-011
Testimony of Mark Fulmer on Behalf of the Core Transport Agent Consortium Concerning PG&E's Core Gas Capacity Planning Range. December 18, 2013.

55. CPUC Application 13-12-012/Investigation 14-06-016
Testimony of Mark Fulmer on Behalf of the Core Transport Agent Consortium Concerning Core Transport Issues in PG&E's Gas Transmission and Storage Rate Case and Consolidated Order Instituting Investigation. August 11, 2014.

56. New Mexico Public Regulation Commission Case No. 13-00390-UT
Direct Testimony of Mark E. Fulmer on Behalf of Renewable Energy Industries Association of New Mexico. August 29, 2014.

57. CPUC Application 14-05-024
Rebuttal Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets and the Direct Access Customer Coalition. September 2, 2014.

58. CPUC Application 13-12-012
Rebuttal Testimony of Mark Fulmer on Behalf of the Core Transport Agent Consortium Concerning Core Transport Issues In PG&E's Gas Transmission and Storage Rate Case. September 15, 2014.

59. CPUC Rulemaking 12-06-013
Direct Testimony of Mark Fulmer on Behalf of the Interstate Renewable Energy Council, Inc. Concerning Residential Electric Rate Design Reform. September 15, 2014.

60. CPUC Application 14-06-011
Testimony of Mark Fulmer on Behalf of the Alliance for Retail Energy Markets, the Direct Access Customer Coalition and the Public Agency Coalition. October 3, 2014.

61. Washington Utilities & Transportation Commission Docket UE-140762 ET AL.
Direct Testimony of Mark Fulmer on Behalf of the Alliance for Solar Choice. October 10, 2014.

62. CPUC Rulemaking 12-06-013
Rebuttal Testimony of Mark Fulmer on Behalf of the Interstate Renewable Energy Council, Inc. Concerning Residential Electric Rate Design Reform. October 17, 2014.

63. Washington Utilities & Transportation Commission Docket UE-140762 ET AL.
Cross-Answering Testimony of Mark Fulmer on Behalf of the Alliance for Solar Choice. November 14, 2014.

64. CPUC Application 14-06-014
Testimony of Mark E. Fulmer on Behalf of the Direct Access Customer Coalition Concerning Phase 2 of SCE's Test Year 2015 General Rate Case Application. March 13, 2015.

65. CPUC Application 14-06-014
Testimony of Mark E. Fulmer on SCE's Application to Establish Marginal Costs, Allocate Revenues, Design Rates, and Implement Additional Dynamic Pricing Rates. March 13, 2015.

66. CPUC Application 13-12-013
Testimony of Mark Fulmer on Behalf of the City of Long Beach, Gas & Oil Department. May, 8, 2015.

67. CPUC Application 14-11-003
Testimony of Briana Kobor, Laura Norin, and Mark Fulmer on Behalf of the Utility Consumers' Action Network Concerning Sempra's Revenue Requirement Proposals for SDG&E and SoCal Gas. May 15, 2015.

68. CPUC Application 13-12-013
Rebuttal Testimony of Mark Fulmer on Behalf of the City of Long Beach, Gas & Oil Department. June 12, 2015.

69. CPUC Application 14-12-017
Testimony of Mark Fulmer on Behalf of the City of Long Beach, Gas & Oil Department. June 22, 2015.

70. CPUC Application 14-12-007
Testimony of Mark Fulmer and Laura Norin on Behalf of the Utility Consumers' Action Network Concerning Risk Assignment of SONGS Decommissioning Costs. July 15, 2015.

71. Federal Energy Regulatory Commission Docket Nos. EL02-60-007, EL02-62-006 (Consolidated)
Answering Testimony of Mark Fulmer on Behalf of Shell Energy North America (US), L.P. July 21, 2015.

72. CPUC Application 14-12-007
Rebuttal Testimony of Mark Fulmer and Laura Norin on Behalf of the Utility Consumers' Action Network Concerning Risk Assignment of SONGS Decommissioning Costs. August 3, 2015.

73. CPUC Rulemaking 14-07-002
Joint Solar Parties Net Energy Metering Successor Tariff Rebuttal Testimony of R. Thomas Beach, Mark Fulmer and Jose Luis Contreras. September 30, 2015.

74. Arizona Corporation Commission No. E-04204A-15-0142
Direct Testimony of Mark Fulmer on Behalf of the Alliance for Solar Choice. November 6, 2015.

75. Arizona Corporation Commission No. E-04204A-15-0142
Direct Testimony of Mark Fulmer on Behalf of the Alliance for Solar Choice. December 9, 2015.

76. Arizona Corporation Commission No. E-04204A-15-0142
    Surrebuttal Testimony of Mark Fulmer on Behalf the Alliance for Solar Choice. February 23, 2016.

77. CPUC Application 15-07-014
    Testimony of Mark Fulmer on Behalf of the City of Long Beach, Gas & Oil Department. March 11, 2016.