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Arizona Corporation Commission  
DOCKETED  
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DOCKETED BY

Attorneys for: INTERSTATE RENEWABLE ENERGY COUNCIL, INC.

**BEFORE THE ARIZONA CORPORATION COMMISSION**

Bob Stump, Chairman  
Gary Pierce, Commissioner  
Brenda Burns, Commissioner  
Bob Burns, Commissioner  
Susan Bitter Smith, Commissioner

IN THE MATTER OF THE APPLICATION  
OF ARIZONA PUBLIC SERVICE  
COMPANY FOR APPROVAL OF NET  
METERING COST SHIFT SOLUTION.

Docket No. E-01345A-13-0248

**LETTER OF THE INTERSTATE RENEWABLE  
ENERGY COUNCIL, INC. TO THE DOCKET**

The Interstate Renewable Energy Council, Inc. (IREC) hereby submits the attached letter  
to the docket.

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Respectfully submitted this 6th day of November, 2013,

/s/ Erica M. Schroeder

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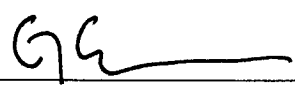
**CERTIFICATE OF SERVICE**

I hereby certify I have this day sent via overnight mail an original and thirteen copies of the foregoing on this 6th day of November, 2013 with:

Docket Control  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

I hereby certify that I have this day served the foregoing documents by mail on all parties of record in this proceeding.

Dated this 6th day of November, 2013, in Phoenix, Arizona.

  
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November 6, 2013

Arizona Corporation Commission  
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**Re: Docket No. E-01345A-13-0248, In the matter of the application of Arizona Public Service Company for approval of net metering cost shift solution**

Dear Commissioners:

On September 30, 2013, Commissioner Pierce filed into this docket the *California Net Energy Metering (NEM) Draft Cost-Effectiveness Evaluation* (California NEM Study or Study), prepared by Energy and Environmental Economics, Inc. (E3) for the California Public Utilities Commission Energy Division. In this letter, the Interstate Renewable Energy Council, Inc. (IREC) offers some additional context for the California NEM Study and provides our perspective on its usefulness in this docket. We note that, since the draft California NEM Study was submitted, the final version of the Study was issued and posted to the California Commission's web site.<sup>1</sup> Few changes were made to the final version as compared to the draft version, however, and the modifications do not affect our statements below.

IREC agrees with the Solar Energy Industries Association (SEIA), which stated in its October 23 letter to this docket that the data from the study are California-specific, and should not inform an evaluation of the benefits and costs of net metering in APS' or any other Arizona utility's service territory. While the specific inputs and results of the California NEM Study are not relevant, IREC recognizes that the Study does offer an opportunity to consider the appropriate methodology to use in assessing the benefits and costs of net metering in Arizona. IREC has some significant concerns with respect to the methodology used in the California NEM Study, which we describe in this letter, and which undermine the Study's results. Generally, the methodology used in the Study tends to undervalue the benefits of net metering. Throughout this letter, we refer to our recently published report identifying best practices in solar valuation methodologies, *A Regulator's Guidebook: Calculating the Benefits and Costs of Distributed Solar Generation (A Regulator's Guidebook)*.<sup>2</sup> In closing, we offer some thoughts on the results of the study, which are already out of date due to changing rate structures in California, and which have been misinterpreted and improperly portrayed since the Study's release. Specifically

<sup>1</sup> Available at [www.cpuc.ca.gov/PUC/energy/Solar/nem\\_cost\\_effectiveness\\_evaluation.htm](http://www.cpuc.ca.gov/PUC/energy/Solar/nem_cost_effectiveness_evaluation.htm).

<sup>2</sup> Available at [www.irecusa.org/wp-content/uploads/2013/10/IREC\\_Rabago\\_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf](http://www.irecusa.org/wp-content/uploads/2013/10/IREC_Rabago_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf).

many have failed to recognize the important finding in the Study's cost-of-service analysis that California NEM customers are not being subsidized.

The Study's benefit-cost analysis should have been limited to the power exported to the grid.

As SEIA pointed out in its October 23 letter to this docket, the California NEM Study analyzes both exported generation from net-metered systems as well as all generation from these systems, including energy immediately consumed onsite. The Study's inclusion of all-output results is inappropriate because the energy used onsite never touches the grid and does not impact other ratepayers; it is analogous to energy conservation or energy efficiency. The scope of the Study's benefit-cost analysis should have been limited to the power exported to the grid from net-metered systems, consistent with best practices as explained in *A Regulator's Guidebook* (pp. 15-16). Longstanding federal law—the Public Utility Regulatory Policies Act of 1978 (PURPA)—and the state policies implementing PURPA already allow a customer to install onsite renewable generation to reduce onsite energy demand, even without net metering. Net metering is simply the bill credit mechanism that credits the customer for power exported to the grid. Thus a study of the impacts of net metering should be based only on exports. IREC notes that to the extent that NEM benefits are calculated to outweigh costs, consideration of all generation amplifies the calculated net benefit. However, if net metering costs outweigh benefits, as was determined in the California NEM Study, the opposite is true. The Study (final p. 4) acknowledges as much when it states that “the all generation scenario included in the attached report likely overestimates the costs that are directly associated with NEM.”

IREC notes that the Study included all-output results because the legislation requiring the Study, Assembly Bill 2514 (Bradford, 2012), mandated this component of the analysis. In other states without such a legislative mandate, like Arizona, IREC would urge that any benefit-cost analyses of net metering examine only exported generation from net-metered systems.

The focus of the Study should be on a lifecycle analysis rather than a one-year “snapshot.”

In its evaluation of NEM, the California NEM Study provides both a 20-year lifecycle analysis and the value of net-metered distributed generation based on a future “snapshot” of the year 2020. This “snapshot” analysis does not capture distributed solar's full value, include its value as a hedge against future increases in fossil fuel prices and the costs to mitigate greenhouse gas emissions. The Study emphasizes these “snapshot” values, however, instead of focusing on the 20-year lifecycle analysis, which leads to a misleading picture of net metering that undervalues its benefits. As discussed in *A Regulator's Guidebook* (p. 18), a distributed solar system should be considered as a 30-year power plant that will, if properly maintained, produce energy and other benefits during that entire period. A study of net-metered generation should examine the full lifetime of the system in order to determine its benefits and costs. In other words, it should use a levelized approach to estimate the benefits and costs of the system over its 30-year lifetime. Levelization involves calculating the stream of benefits and costs over an extended period and discounting to a single present value, which captures the entire stream of benefits and costs. While the California NEM Study includes such an analysis—based on a 20-year lifetime instead of the 30-year lifetime that IREC recommends—it should be better emphasized as the primary valuation methodology on which readers should focus.

The Study should have considered the societal benefits associated with net metering.

Typically the societal benefits of distributed solar generation are what motivated the enactment of policies promoting such generation, including in particular net metering. Therefore, these benefits should not be ignored or not quantified in a benefit-cost assessment of net metering. Societal benefits may include public health benefits, employment and downstream economic effects, market price impacts, grid security benefits, and water savings. A more thorough discussion of the nature of these benefits and how to calculate them is provided in *A Regulator's Guidebook* (Section IV). The California NEM Study excluded all of these benefits from consideration, despite the explicit recognition of them in California law. For example, Senate Bill 1 (Murray 2006), which expanded net metering and established the California Solar Initiative, states: "A solar initiative should be a cost-effective investment by ratepayers in peak electricity generation capacity where ratepayers recoup the cost of their investment through lower rates as a result of avoiding purchases of electricity at peak rates, with additional system reliability and pollution reduction benefits." (emphasis added) The California NEM Study (final p. 2) even acknowledges that "significant environmental, public health and other non-energy benefits occur." Nonetheless, it does not include those benefits in its evaluation. By excluding societal benefits from its analysis, the Study undervalues net metering in California.

The Study failed to consider all avoided transmission costs.

The California NEM Study did not fully consider the reduced need for transmission lines due to net-metered generation, thereby undervaluing a significant benefit of net metering. Specifically, the study did not consider the avoided costs of high-voltage transmission lines under the jurisdiction of the California Independent System Operator (CAISO) for Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E), considering only the avoided costs "downstream" of CAISO. Drawing the line for consideration here is arbitrary, especially because SCE and SDG&E have calculated such benefits, and SDG&E included them in its own draft solar distributed generation study released earlier this year. Past impact evaluation reports for the California Solar Initiative have shown that participating solar systems reduce peak demand on the transmission system on at least a one-for-one basis, make additional capacity available on the transmission system, and thus avoid future transmission line expansion costs. The discussion of transmission and distribution benefits in *A Regulator's Guidebook* (pp. 26-29) further supports the inclusion of avoided transmission costs in a benefit-cost analysis of net metering. Excluding these avoided transmission costs contributes to the California NEM Study's undervaluing net metering.

Avoided capacity values should have been included in the Study from day one in the base case.

As explained in *A Regulator's Guidebook*, in determining avoided capacity costs, distributed generation can be difficult to assess under traditional utility resource planning models because it provides small, incremental additions whereas traditionally utilities add capacity in large, or "lumpy," blocks. Nonetheless, the Federal Energy Regulatory Commission (FERC) has recognized that distributed generation provides a more flexible manner to meet growing capacity needs and can allow a utility to defer or avoid the "lumpy" capacity additions. 18 C.F.R.

292.304(e)(2)(vii). It is important and appropriate that benefit-cost analyses recognize the incremental value of small capacity additions, as well. However, the California NEM Study does not recognize this value and only values net-metered capacity beginning in the so-called Resource Balance Year (RBY) of 2017. This approach ignores utilities' responsibility for predicting load growth and planning accordingly, such that the full penetration of distributed generation installations should already be built into their plans, reflecting the incremental capacity benefits these systems provide. As a result, the capacity benefits of net metering are undervalued in the Study.

This undervaluing of capacity benefits is magnified by the inclusion of the San Onofre Nuclear Generation Station (SONGS), significant source of capacity in California, in the tallying of available capacity resources. SCE announced that it intends to permanently shut down SONGS Units 2 and 3 in June 2013, however the Study does not take this into account. In reality, shutting down SONGS increases the value of new incremental capacity additions from distributed generation. Even under the RBY-based approach used in the California NEM Study, the RBY is advanced from 2017 to 2016 with the closure of SONGS; in other words, the value of new distributed capacity should be recognized sooner.

The Study's approaches to allocating avoided capacity costs are not established or transparent.

As discussed in *A Regulator's Guidebook* (p. 28), in estimating avoided capacity costs, it can be helpful to use an allocation methodology to assign capacity value to specific hours in the year and then allocate estimated marginal costs to those hours. It is important, however, to ensure that the methodology used is transparent and well vetted. The California NEM Study uses a new and relatively unfamiliar models for allocating both generation and distribution capacity costs, which made it difficult for IREC and other parties to assess these methodologies and their outcomes. As emphasized throughout *A Regulator's Guidebook*, it is critical to be transparent in studies like the California NEM Study regarding the methodologies used to allocate avoided capacity costs and for other analyses so that stakeholders can properly evaluate a study's results. Likewise it is often easier and more appropriate to use familiar models, which have been previously vetted and with which all parties are comfortable.

The Study relies on incorrect heat rates to evaluate the avoided energy costs of net metering.

As explained in *A Regulator's Guidebook* (pp. 21-22), the calculation of avoided generation costs over time must account for degradation in the marginal generation plant and adjust expected heat rates. Heat rates are the measure of efficiency by which a unit creates electricity by burning fuel for heat to power a turbine. Over time, the marginal generation plant will become less efficient and require incrementally more fuel to reach the same production levels; in other words, its heat rate will increase. The California NEM Study relies on heat rate projections from the 2010 California Public Utilities Commission Long Term Procurement Plan. With SONGS going out of service, as discussed above, actual average heat rates in California are expected to be significantly higher than anticipated in the Study; that is, the generation fleet is expected to be significantly less efficient without SONGS. Therefore, net-metered generation will be displacing less efficient generation than what was evaluated in the Study, which means that the Study

undervalues the benefit of this net-metered generation. This oversight in the Study demonstrates the importance of using appropriate heat rates in a net metering evaluation.

Net-metered generation should be valued at 100-percent of the RPS value in the Study.

Net-metered solar generation is 100-percent renewable. The California NEM Study, however, does not fully value the 100-percent renewable content of this net-metered generation. Instead it values net-metered generation as comparable only to the 20-percent or 33-percent renewable grid power that NEM generation displaces; that is, it compares it to generation that is meeting California's gradually increasing Renewables Portfolio Standards (RPS). There is additional value to renewable energy in excess of the RPS minimum requirements, however. As discussed in *A Regulator's Guidebook* (pp. 33-34), such 100-percent renewable generation should be valued at 100-percent of the RPS value in assessing avoided energy costs rather than at only 33 percent or whatever the RPS mandate in a particular state is.

The Study does not justify its use of different approaches in its cost-of-service analyses.

The California NEM Study provides both a benefit-cost analysis and a cost-of-service analysis, which offer different insights into the value of net metering in California. The benefit-cost analysis essentially compares the bill savings of net metering customers to the reduction in utility costs attributable to net-metered generation on its system. If the bill savings of net-metered customers are greater than utility avoided costs, this means that other utility customers are bearing increased costs since the utility can pass its costs onto them. The cost-of-service analysis evaluates whether net-metered customers are paying their full cost of service, as defined by the utilities. Much attention has been paid to the benefit-cost analysis. IREC finds the cost-of-service analysis equally if not more important, however. This analysis indicates that net metering customers in the aggregate are covering their fair share of the utility's cost of service.

IREC agrees with the basic methodological approach to the cost-of-service analysis used in the Study, which attempts to distinguish what it costs specifically to serve net metering customers given their distinct operational characteristics. IREC would expect this approach to capture the benefits that net metering customers provide when they offset consumption during peak times and reduce strain on available distribution capacity. In its analysis of SDG&E, however, the Study assigns net metering customers' entire distribution capacity costs to accounts based on the maximum demand of the account. This approach essentially means that there is no difference between the cost of serving net metering customers and other non-net metering customers in the same class. Moreover it is inconsistent with SDG&E's rate design, as well as the approach used to evaluate Pacific Gas and Electric (PG&E) and SCE. Due to this inconsistency, the results for SDG&E are disparate from those for PG&E and SCE. Furthermore, the SDG&E results skew the average results downward significantly, suggesting that residential solar customers fail to cover a significant portion of the costs of service.

While *A Regulator's Guidebook* focuses on best practices for benefit-cost methodologies and does not address cost-of-service analyses, IREC believes that it is just as critical to ensure that a careful and consistent methodology be adopted for cost-of-service analyses. The California NEM



Study uses inconsistent approaches between the three California utilities, which undermines its results.

The Study's income analysis does not reflect that net metering customers must be homeowners.

In addition to the benefit-cost and cost-of-service analyses described above, the California NEM Study also provides an analysis of the household income of net metering customers. IREC disagrees with the methodology used in this income analysis. The Study compares net metering customers against all California households, creating a bias that does not take reflect that most net-metered systems are installed by customers that own their residences. IREC believes it would be more appropriate to compare the median income of net metering customers to the overall median income of all homeowners in a given state or utility service territories. Otherwise the analysis demonstrates more regarding the gap in income between homeowners and renters rather than net metering and non-net metering customers.

The results of the Study are already out of date due to changing rate structures.

While this letter focuses on the methodologies used in the CA NEM Study, IREC offers some thoughts on understanding the results of the Study as well. As emphasized repeatedly throughout the Study, rate design plays a fundamental role in its calculations and changes to rate design would likely have substantial impacts on the Study's results. The Study uses already outdated 2011 rate structures, despite significant recent changes to residential rates in California. Furthermore, even more significant rate reforms are expected in 2014 as a result of enactment of Assembly Bill 327 (Perea 2013), which removes caps on lower-tier rate increases and authorizes new fixed charges. As a result, the California NEM results are already out of date and will become even more so with coming rate reform.

The results have been widely misinterpreted and improperly portrayed.

Since its publication, a number of articles quote the California NEM Study as demonstrating that net metering represents a \$1 billion per year subsidy in California. This figure is based on the 2020 "snapshot" analysis of the "all generation" scenario, and is therefore problematic on two levels, as discussed above. The more relevant results from the Study's benefit-cost analysis are the average levelized net cost and lifecycle cost of net metering in an export-only scenario, which are \$0.12 per kWh and \$1 per Watt, respectively (final p. 69). Unfortunately neither E3 nor the California Public Utilities Commission have taken steps to correct this misperception. As noted above, the Study (final p. 4) does acknowledge that it likely overestimates the costs associated with net metering, but this appears not to have filtered out in public reviews of the Study.

In addition, IREC urges stakeholders reviewing the study to keep in mind the significant finding that net metering customers in the aggregate pay more for their service than it costs to serve them, meaning that there is no subsidy. The Study (final p. 10) recognizes this, but only indirectly, stating that "[a]fter the installation of NEM generation, the aggregate gap between bills and the full cost of service shrinks dramatically." This means that net metering customers used to pay much more than their cost of service, and now just pay a little bit more than their

cost of service. This description fails to highlight the primary fact that California NEM customers are not being subsidized.

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As the discussion above illustrates, the California NEM Study generally undervalues net metering due to the benefit-cost methodology it uses. Moreover, its results are already out of date due to changes in rate structures. Although not the focus of this letter, IREC is also concerned by other specific input data used in the Study. For example, the Study does not use updated marginal cost estimates from the California utilities' latest general rate cases. These questionable data tend to further undermine the Study's results.

In the end, as SEIA emphasizes in its October 23 letter to this docket, the Study's results are not relevant to this docket or the consideration of net metering Arizona. To the extent the Commission and other stakeholders wish to glean information regarding appropriate methodologies to use in evaluating net metering, IREC recommends considering the Study's limitations and our concerns as described above.

Sincerely,

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