BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Investigation of the cost and benefits of distributed generation and the effect of distributed generation on utility provision of electric service	Docket No. UE-131883

COMMENTS OF ENERGY AND ENVIRONMENTAL ECONOMICS, INC.

December 2, 2013

Energy and Environmental Economics, Inc. ("E3") respectfully submits these comments pursuant to the Washington Utilities and Transportation Commission's ("Commission's") Docket No. UE-131883 investigating the costs and benefits of distributed generation and the effect of distributed generation on utility provision of electric service. E3 is a San Francisco consulting firm with significant experience in cost-benefit analysis and avoided cost calculations for customer-owned resources such as energy efficiency, demand response and distributed generation. E3 recently completed a report for the California Public Utilities Commission ("CPUC") entitled "California Net Energy Metering Evaluation", which calculated the costs, benefits and cost shifts associated with California's Net Energy Metering program, as experienced by the state's investor-owned utilities. E3 partner Arne Olson was an invited panelist at the Commission's November 13, 2013 workshop in the above-referenced docket. E3 is aware that comments were submitted in this docket by The Alliance for Solar Choice (TASC) in reference to E3's California NEM report, referred to hereinafter as the "E3 Study" (consistent with TASC's comments). E3 respectfully submits these comments to provide additional information about that study for the Commission's consideration.

TASC provided four specific critiques of the E3 Study. We reproduce those comments below and provide responses.

TASC Critique #1: "The E3 Study inappropriately included energy used on-site in assessing the impacts of net metering. As discussed above, when assessing the rate impacts of net metering as a policy, it is important that the study be limited to assessing the costs and benefits of energy exported to the grid only."

E3 Response: The E3 Study was prepared in response to Assembly Bill (AB) 2514 and Commission Decision (D.) 12-05-036 implementing AB 2514. AB 2514 directed the Commission to "consider all electricity generated by renewable electric generating systems."[1] In accordance with this direction, the E3 Study calculated the cost shifts two ways: (1) the cost shift associated with the total quantity of electricity generated by NEM systems, and (2) the cost shift associated with only the quantity of electricity exported to the grid.

It is our observation that the Legislature, Commissioners and stakeholders have found it useful to consider both numbers, because each measures different things. The first value measures the impact on the utility and non-participating customers of the distributed generation systems in total. The second value measures only the direct impact of the net energy metering mechanism for compensation of behind-the-

[1] Add cite.

meter generation. We also note that the ability of residential NEM customers to export energy to the grid during daylight hours is critical to the favorable economics of residential NEM photovoltaic (PV) systems, making it difficult to conceive of a credible counter-factual case in which residential PV systems are configured so as never to export energy to the grid.

TASC Critique #2: "The E3 Study used outdated 2011 rates despite significant changes to residential rates in California since 2011. Throughout the study, as mentioned above E3 notes that rate design plays a fundamental role the calculations performed in the Study. Yet, when E3 calculated customer bill savings, E3 utilized outdated 2011 rates. Moreover, rates in California are expected to change substantially in the near future due to enactment of recent legislation that removes rate caps on lower-tiers of energy use and authorizes new fixed charges. As a result, the conclusions from the E3 Study are already out of date."

E3 Response: The E3 Study involved a detailed, hourly, customer-by-customer analysis of electricity consumption and generation patterns. In order to ensure a robust study outcome, E3 used rate, consumption and generation data from 2011, which was the most recent calendar year in which a complete dataset was available. TASC is correct that PG&E's

residential rate tiers have been adjusted since 2011; however, the largest reductions took place prior to 2011 and are reflected in the E3 Study.

E3 also recognizes that Assembly Bill 327, passed in September 2013, provides the CPUC with authority to make significant changes to retail electric rate designs, such as flattening tiers, increasing customer charges, moving to time-of-use rates, or other changes. Such rate design changes could ameliorate the cost shifts identified in the E3 Study. We believe that the E3 Study provides a firm analytical basis for determining the relative impacts of these potential changes. We also note that (1) the CPUC has not yet approved any changes to rate designs, and in the absence of such it is impossible to determine how changes in future rates will affect the cost shifts estimated in the E3 Study; and (2) AB 327 also directed the CPUC ensure that customers who install NEM systems prior to 2017 continue to receive benefits from their investments, meaning that cost shifts may linger long after rate designs have been changed.

TASC Critique #3: "The E3 Study failed to include avoided high voltage transmission costs despite numerous studies recognizing that because DG resources are located on or close to load on the distribution system during peak load periods, it decreases peak loading on the transmission system. Of particular note is the findings of the 2009 CSI Impact Evaluation Report that at California's current level of installed capacity

(1853 MW) the transmission capacity benefit would be equivalent to a 500 kV transmission line."

E3 Response: E3 agrees that DG resources that are located in load centers tend to decrease peak loading on bulk transmission facilities. However, it does not necessarily follow that these resources have significant financial value in the form of avoided high voltage transmission investments. The 2009 CSI Impact Evaluation Report (an E3 report) used a high-level heuristic that *assumed* NEM systems would result in reduced high-voltage transmission costs at the rate of $45/kW-yr. As a result, the study indicated a modest transmission deferral benefit for CSI systems. However, load reductions stemming from the 2008-2009 recession have deferred the need for new transmission. For the 2013 NEM report, E3 researched load-growth-driven transmission investments in the California Independent System Operator's 2012 Transmission Plan and found that *none* of the high-voltage transmission projects in the CAISO's plan is driven by load growth. In fact, of the 71 transmission projects in the last two CAISO transmission plans, only one project was identified as needed for load growth. Thus, while customer-sited DG does have the potential, in theory, to defer investments in new transmission facilities, it appears that there are very little actual savings in the specific case of California in this decade.

TASC Critique #4: "The E3 Study used a 'snapshot' of DG value versus value over the full life of the net metered DG under study. As discussed above, it is essential that valuation of DG benefits be performed over the full life of the DG resource being studied. This decision dramatically undervalued the benefits DG can provide as a hedge against volatile natural gas prices, the cost of mitigating greenhouse gas emissions and deferral of T&D investments."

E3 Response: E3 agrees that it would be potentially more accurate to perform the analysis over the full, 20+ year lifetime of the NEM systems, if the forecasts of fundamental drivers underlying the analysis were not in themselves highly speculative over the life of the systems. Such analysis would require year-by-year estimates of the number of systems installed, the state of the underlying grid, and a projection of retail rates and rate designs. The most important effects that are omitted from the snapshot analysis are related to:

- Increases in retail rates and their design. Since we anticipate that retail rate designs will be changed in the timeframe of the analysis given AB 327, a lifecycle assessment with rates and rate structures locked at current designs through 2040 would be highly speculative, as would prejudging the outcome of new rate designs.

- Fuel and CO2 price escalation. While long-term studies typically project monotonic increases and natural gas and CO2 prices over time, such an outcome is far from certain.
- Renewable integration costs. E3 did not develop detailed estimates of renewable integration costs for the 2013-2020 timeframe when such costs are expected to be low. However, recent work has indicated that integration costs may grow significantly as California moves beyond a 33% RPS.

Overall, we think it is likely that retail rates will escalate faster than the underlying avoided costs, due largely to projected investments needed to replace aging infrastructure and other factors unrelated to growth and resource needs, and therefore a lifecycle assessment would show a greater cost shift than the methodology used. However, given the wide range of possible futures over a 20+ year time horizon, a number of alternative scenarios would need to be considered, increasing the study time and cost. We believe the "snapshot" approach is adequate to answer the questions posed by the legislature about the potential costs, benefits and cost shifts of DG under California's current NEM and rate design policies.

E3 appreciates the opportunity to submit these comments and clarifications to augment the Commission's record in this docket.

Respectfully submitted this 2nd day of December, 2013.

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