BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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)

CLEAN COALITION POST-WORKSHOP COMMENTS

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I. INTRODUCTION

On August 11, 2014, the California Public Utilities Commission ("CPUC") Energy Division staff conducted a public workshop on a methodology known as the "Public Tool" that will test options for a successor to the existing net energy metering ("NEM") tariffs. Administrative Law Judge Simon subsequently issued a ruling seeking responses to a series of questions related to the Public Tool on September 5, 2014. The Clean Coalition offers the following comments on the Public Tool, which generally focus on aligning NEM 2.0 with AB 327's requirement for utilities to develop Distribution Resources Plans ("DRPs"). A diversified portfolio approach that targets optimal locations is essential for meeting legislative requirements to ensure sustainable growth of customer-sited distributed renewable generation, while keeping total benefits and costs of the program to the electrical system approximately equal.

The Clean Coalition is a California-based nonprofit organization whose mission is to accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise. The Clean Coalition drives policy innovation to remove barriers to procurement, interconnection, and realizing the full potential of integrated distributed energy resources ("DER"), such as distributed generation, advanced inverters, demand response, and energy storage. The Clean Coalition also works with utilities to develop community microgrid projects that demonstrate that local renewables can provide at least 25% of the total electric energy consumed within the distribution grid, while maintaining or improving grid reliability. The Clean Coalition participates in numerous proceedings before California, other state, and Federal agencies throughout the United States.

II. RESPONSES TO QUESTIONS

a. Modeling Approach

i. Question 4

The Clean Coalition recommends that energy purchases include not only the quantity of purchases but also the market energy price impact—lower market demand during NEM production periods will reduce the cost of economically dispatched resources,[1] in addition to the demand price curve for natural gas supplies, and this price impact should be reflected.

Several forms of grid support—voltage, VAr, phase balancing—associated with advanced inverter functionality will be available from distributed generation systems installed after 2015,[2] in conjunction with telemetry from these inverters that can improve grid operation. This support can include significant savings resulting from conservation voltage reduction ("CVR") and increased grid resilience, outage avoidance and potential outage mitigation, and should be incorporated as values either within existing avoided cost components or as additional categories.

Customer sited generation impacts will also be significantly altered when associated with local energy storage and integrated with various DER. For example, the Clean Coalition is currently engaged in modeling high penetration distributed generation scenarios and least cost mitigation measures throughout the Hunters Point substation feeder system, demonstrating that siting decisions greatly impact the net ratepayer costs and values derived from DER. Such location specific values are to be reflected in the 2015 Distribution Resource Plans ("DRP") currently being developed under AB 327,[3] and associated siting categories will greatly influence the net impact of NEM successor projects on each avoided cost component.

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[1] Renewables Int'l, *Merit order effect of PV in Germany* (Feb. 2, 2012), *available at* http://www.renewablesinternational.net/merit-order-effect-of-pv-in-germany/150/510/33011/.

[2] CPUC Rule 21 interconnection tariff reform, Rulemaking 11-09-011.

[3] Public Utilities Code 769, CPUC Rulemaking 14-08-013.

The Clean Coalition therefore recommends that the avoided cost calculator also take into consideration optimal locations for siting of renewable distributed generation ("DG"), and we recommend including DRP locational categories as an additional component and potential modifier for other components.[4]

As identified in the calculator, renewable DG can have substantial locational value to ratepayers, including avoided transmission costs, avoided line losses, and avoided transmission and distribution upgrade costs. However, significant variation in this value will result depending on where the resource is sited on the grid. Such locational value especially applies to any portion of the generation that is deemed "deliverable" and does not exceed 100% of the coincident load at the substation, as all such generation avoids use of transmission system and associated access charges when delivering energy to load. Properly structuring the avoided cost calculator to include locational value can support the DRP requirements compliance by attempting to guide NEM 2.0 projects to optimal locations on the grid through appropriate valuation, and encouraging customers to size projects to available space at the site and available capacity on the feeder line section, rather than to onsite load.

Utilities across the country are continuing to build expertise quantifying locational values, such as how local solar capacity may avoid, reduce, or defer the need for additional new transmission capacity. For example, the Long Island Power Authority ("LIPA") recently offered a 7¢/kWh premium to 40 MW of appropriately sited solar DG facilities to encourage locational capacity sufficient to avoid $84,000,000 in new

[4] Generally, the Clean Coalition recommends ensuring that NEM 2.0 is consistent with the Section 769 Distribution Resources Plans requirements to guide distributed energy resources to optimal locations on the grid. In addition to requirements relating to NEM, AB 327 added Public Utilities Code 769, which requires the investor owned utilities to submit Distribution Resources Plans by July 2015 that identify optimal locations for distributed energy resources and guide these resources to optimal locations on the grid. These plans must "Evaluate locational benefits and costs of distributed resources located on the distribution system. This evaluation shall be based on reductions or increases in local generation capacity needs, avoided or increased investments in distribution infrastructure, safety benefits, reliability benefits, and any other savings the distributed resources provides to the electric grid or costs to ratepayers of the electrical corporation." Such plans must also "Propose cost-effective methods of effectively coordinating existing commission-approved programs, incentives, and tariffs to maximize the locational benefits and minimize the incremental costs of distributed resources."

transmission costs that would otherwise be incurred, expecting a net savings of $60,000,000.[5]

Transmission Access Charges ("TAC") can also be used as a proxy to quantify locational value. This is a flat "postage stamp" fee for every kWh delivered to the distribution system from the transmission grid. TACs are avoided by energy that is delivered directly to the distribution system to serve loads on the same substation. The Clean Coalition supports the following test for assigning avoided TAC costs to the value of an eligible project. Any portion of the generator's output that is below the minimum coincident load ("MCL") at the substation level will not utilize the transmission system, and therefore should be credited for avoided TAC costs. Any portion of the generator's output that is above MCL at the substation level will be deemed to backfeed the transmission system and will not be credited towards TAC costs. For example, if 90% of the output of a generator falls below MCL, and 10% of the output is above MCL, then the 10% of the output would be presumed to backfeed to the transmission system and would be associated with TAC. The project would be associated with the additional value of avoided TAC and avoided future TAC rate increases for 90% of its output over the course of its 20-year contract.

In the previously referenced Hunters Point Project, in collaboration with Pacific Gas & Electric ("PG&E") the Clean Coalition is evaluating and demonstrating the feasibility and practicality of providing up to 25% of total annual electric energy consumption through local renewable generation. This work leverages advanced-grid modeling tools that can guide distributed energy resources to the best locations on the grid and reduce the uncertainty surrounding costs and timeframes involved in grid interconnection, providing the basis for DRPs. The Clean Coalition's independent economic analysis of the project shows that over the course of 20 years, each additional 10 MW of local distributed generation will avoid $7,580,000 in TAC, $2,367,000 in line losses, and an

[5] LIPA, *Proposal Concerning Modifications to LIPA's Tariff for Electric Service*, http://www.lipower.org/pdfs/company/tariff/proposals-FIT070113.pdf. LIPA's guidance states: "The rate will be a fixed price expressed in $/kWh to the nearest $0.0000 for 20 years applicable to all projects as determined by the bidding process defined below, plus a premium of $0.070 per kWh paid to projects connected to substations east of the Canal Substation on the South Fork of Long Island."

average of $6,100,000 in new transmission capacity costs.[6]

Further, the avoided cost calculator should take into account the additional benefits that arise from the interaction of multiple types of DER. For example, electric vehicle charging stations sited in the same area as solar DG can balance out the variation and impacts of the power source, while the DG can meet the new load requirements associated with the rapidly expanding use of EVs. Such synergies extend further into both reducing the net system generation ramp rates and associated increased flexible resource requirements, while simultaneously allowing EVs to capture such value—reducing their cost of ownership and enhancing their adoption. As part of the DRP process, the IOUs will identify higher opportunity and value locations, which will help to quantify these benefits. Additionally, the Load Modifying Demand Response Valuation Working Group, which was established following a recent settlement agreement concerning demand response,[7] will also quantify the benefits resulting from interaction of multiple types of DER. This cost component should be added to the avoided cost calculator to more accurately assess the benefits of renewable distributed generation under various deployment scenarios.

The Clean Coalition therefore recommends that the avoided cost calculator also take into consideration interaction of multiple types of DER on the net costs and benefits, including State goals, programs, and procurement plans, such as EV adoption targets and energy storage procurement.

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[6] CLEAN COALITION, AN ENERGY, ECONOMIC, AND ENVIRONMENTAL BENEFITS ANALYSIS FOR HIGH PENETRATIONS OF RENEWABLE ENERGY IN SAN FRANCISCO'S BAYVIEW-HUNTERS POINT AREA (2013), *available at* http://www.clean-coalition.org/site/wp-content/uploads/2013/12/HPP-Benefits-Analysis-19_jb-20-Dec-2013.pdf.

[7] Motion for Adoption of Settlement Agreement Between and Among Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, California Independent System Operator Corporation, Office of Ratepayer Advocates, the Utility Reform Network, California Large Energy Consumers Association, Consumer Federation of California, Alliance for Retail Energy Markets, Direct Access Customer Coalition, Marin Clean Energy, Enernoc, Inc., Comverge, Inc., Johnson Controls, Inc., Olvine, Inc., Energyhub/Alarm.com, Sierra Club, Environmental Defense Fund, and Clean Coalition on Phase 3 Issues, Cal. Pub. Utils. Comm'n, R.13-09-011 (Aug. 4, 2014), *available at* http://www.clean-coalition.org/site/wp-content/uploads/2014/08/clean_Motion-for-Adoption-of-Settlement-Agreement_FINAL_CPUC_Settlement-attached.pdf.

Finally, the Clean Coalition recommends adding two other avoided components: reductions in wholesale power cost and the time of delivery ("TOD") value associated with an increased supply of renewable DG. Installing a large volume of renewable DG will displace electricity currently produced using natural gas during peak load and therefore reduce demand for natural gas. Due to the inverse price elasticity of supply, natural gas prices will be depressed nationally and regionally, resulting in significant ratepayer savings caused by the increased supply of renewable DG.

For the TOD component, as solar energy generally offsets peak or near-peak loads, electricity produced by photovoltaics ("PV") is on average more valuable than that of their baseload counterparts. This can be quantified in a TOD multiplier to the base Market Price Referent ("MPR"), as shown in the CPUC resolution E-4214 to the MPR. For solar, the TOD value multiplier is approximately 1.3.

ii. Question 6

The Clean Coalition recommends that the Public Tool model higher goals under the Renewable Portfolio Standard ("RPS"). Senate Bill 2 requires an increase in procurement from eligible renewable energy resources to 33% of total procurement by 2020, but Governor Brown has clarified that this represents only a minimum quantity and not a limit on procurement. It is widely acknowledged that California will need to continue increasing its reliance on renewable energy resources to comply with mandated GHG reductions and associated goals, including 12,000 MW of renewable distributed generation by 2020. The Public Tool should therefore model a higher RPS goal that increases over time.

Likewise, the Public Tool should support both scenario and sensitivity analyses associated with factors such as GHG emission costs and fuel costs to illustrate the uncertainty and risk embedded in results. We recommend that this be user modifiable, and standard values should be defined under alternate high, medium and low scenarios conforming to adopted California Energy Commission ("CEC") values, such as established in the CEC Cost of Generation model.

iii. Question 7

The Clean Coalition recommends referencing the least cost best fit ("LCBF") analysis and cost allocation methodology ("CAM") as the areas are where integration costs are addressed. We note that the recently adopted AB 2363 legislation requires that renewable integration cost evaluation methods and values be reviewed and adopted in 2015. We recommend utilizing current adopted values, with CPUC draft proposed modifications to these values included as scenario alternatives.

iv. Question 8

The Clean Coalition recommends that costs be assigned and determined for each utility in accord with CAM, which shares some costs across all ratepayers and assigns others separately.

Because of the context-dependent nature of this inquiry and the varying levels of cost savings associated with optimal locations, distribution level utility costs should be determined separately for each IOU. As noted above, the IOUs are investigating these costs as part of the DRP process required by AB 327. Transmission level investments have historically been defined as a general resource and shared across utilities. By incorporating location-specific costs, the Public Tool could work to incentivize siting renewable DG in areas of high locational value.

Utility costs should be determined partly by the locational value present at each substation. Each substation area will present a unique context for IOUs to take advantage of optimal locations to cost-effectively compensate renewable DG and other DER, and the costs of deployment will vary from substation to substation. The Clean Coalition's work with PG&E on the Hunters Point Project has shown that a substation can cost-effectively achieve 25% of total electric energy needs from local renewables.[8] However, the low-cost

[8] CLEAN COAL., OPTIMIZING DISTRIBUTED ENERGY RESOURCES IN A COMMUNITY MICROGRID: METHODOLOGY AND CASE STUDY (Draft, Sept. 21, 2014), *available at* http://www.clean-coalition.org/site/wp-content/uploads/2014/09/Clean-Coalition-Comments-on-REV-Track-One-Straw-Proposal_Final-01-bk-22-Sept-2014.pdf (attached as Exhibit 2).

approach identified in the project relies on siting DER in areas of high demand and on robust feeders, and each substation area will have an optimum suite of DER that could be deployed at low cost.

b. Data sources

i. Question 10

The Clean Coalition generally supports the proposed guiding principle for sourcing data. The principle expresses a preference for using the best publically available data. However, it also recognizes that some information is not publically available and will need to be gathered through CPUC data requests to the IOUs. Accurately identifying costs and locational value requires access to confidential data that may be protected under state and federal law.[9] Even though this data is not publically available, it should be included in the Public Tool to adequately capture locational value.

We further clarify that the cost impacts incurred by utilities and ratepayers will be determined in accord with regulatory standards, and such costs may vary from arguably more accurate methodologies or sources. The Public Tool should reflect adopted or other values required to most accurately reflect costs as they will be realized in practice, suggesting that the principle should be to use the best *applicable* data.

c. The Public Tool

i. Questions 15 and 16

The Clean Coalition strongly recommends that the impact of smart inverter technologies paired with DG applications be examined and incorporated. Deploying renewable DG systems without advanced inverters results in voltage swell, potential overvoltage, wider

[9] The Clean Coalition recommends that the CPUC use data at the local transformer level, which does not identify individual customers and is generally sufficient for locational benefits determinations.

voltage variability (in the case of PV), and reduced opportunity to implement CVR measures. When paired with renewable DG, smart inverters are capable of providing valuable grid services—real and reactive power, voltage, and frequency control. Smart inverters can also enable greatly improved data acquisition and communication with a distribution system operator.

Moreover, deploying renewable DG with advanced inverters supports both CVR savings and higher levels of distributed generation.[10] In the past, electric utilities employed CVR to achieve load reductions by reducing the voltage delivered to large home appliances and industrial machinery—especially during critical peak load periods. Smart grid technologies and real-time operating systems now allow utilities to realize significant energy savings and demand reduction of 3% or more on a continual basis. The Pacific Northwest National Laboratory estimated that total U.S. energy savings from CVR may be as high as 56,940,000 MWh. If the priority is to regulate end-user energy consumption, costs decrease for end-users. If losses are minimized, line capacities are released, and costs decrease for utilities.

CRV can be accomplished through a variety of well-known technologies, but advanced inverters can perform similar functions with greater speed and accuracy, and at lower cost. Advanced inverters perform the functions inherently in co-location with DER, and the equipment will be installed with each DER system. One notable CVR pilot project has proven that significant energy savings are possible, and that implementing CVR in conjunction with DER allows these savings to be achieved at no additional cost while also allowing higher penetrations of DER and lowering integration costs.[11]

[10] *See* Kellogg Warner & Ron Willoughby, Conservation Voltage Regulation: An Energy Efficiency Resource, IEEE Smart Grid (April 2013), *available at* http://smartgrid.ieee.org/april-2013/842-conservation-voltage-regulation-an-energy-efficiency-resource.

[11] *Id.*

d. Pricing mechanisms and rate design

i. Question 22

The Clean Coalition recommends that the Public Tool include compensation value for grid services that may be provided beyond simple energy (kWh) or time of delivery. For example, as noted above, installed systems may be called upon to provide fixed or variable reactive power, and may be required to curtail peak production or install greater inverter capacity to provide these services, and should be compensated commensurate with the avoided cost of provisioning these services through other means. These values may be compensated separately or bundled with FiT rates, but should be explicitly accounted for.

III. CONCLUSION

The Clean Coalition appreciates the opportunity to comment on Administrative Law Judge Simon's questions related to the Public Tool.

Respectfully submitted,

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