**BEFORE THE PUBLIC UTILITIES COMMISSION**

**OF THE STATE OF CALIFORNIA**

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| Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues. | Rulemaking 12-11-005<br>(Filed November 8, 2012) |

# COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. ON THE ASSIGNED COMMISSIONER'S RULING REGARDING THE SAFETY CONSIDERATIONS FOR INTERCONNECTION OF ENERGY STORAGE SYSTEMS PAIRED WITH RENEWABLE GENERATORS ELIGIBLE FOR NET ENERGY METERING

Laurence G. Chaset
Sky C. Stanfield
Keyes, Fox & Wiedman LLP
436 14th Street, Suite 1305
Oakland, CA 94612
Phone: 510.314.8204
Fax: 510.225.3848
sstanfield@kfwlaw.com
lchaset@kfwlaw.com

Counsel to the Interstate Renewable Energy Council, Inc.

January 8, 2014

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## INTRODUCTION

On October 17, 2013, an Assigned Commissioner's Ruling ("ACR") in the above-captioned proceeding was filed and served on the parties. The parties' initial comments on this ACR were filed on November 1, 2013, and Reply Comments were filed on November 8, 2013. The Interstate Renewable Energy Council, Inc. ("IREC") timely submitted both initial comments and reply comments on the ACR.

On December 10, 2013, Scott Murtishaw, Energy Advisor to President Peevey, posed a set of questions in an e-mail to the parties to this proceeding that was later followed by an additional ACR on January 6, 2014. The email and January 6th ACR noted that the various comments submitted in response to the October 17th ACR contained limited discussion of the safety considerations specific to energy storage, and thus in order

to build a more comprehensive record on safety, the January 6th ACR poses a series of safety-related questions. These questions are as follows:

**Safety and Reliability Impacts to the Utility Distribution System**

1) Are there any safety or reliability concerns associated with the interaction of customer-side energy storage with the utility grid that are *not* currently being addressed through Rule 21?

2) If certified equipment is used, should any other protections be required that would prevent a customer from tampering with the equipment, potentially compromising the anti-islanding or other safety features installed on the device?

**Safety Impacts on the Customer Premises**

3) There appear to be three types of safety concerns related to the interaction of the energy storage device within the home/business environment: a) fire hazards, due to overheating or exposure to open flames, b) electric shock hazards to emergency responders, and c) containment of hazardous materials in the event of fire or other disasters. To what extent does Rule 21, and the equipment certifications required therein, address these safety concerns?

4) As part of the Rule 21 interconnection application process NEM applicants are required to provide evidence of the final electric inspection clearance from the governmental authority having jurisdiction over the generating facility. Does this provision typically involve every relevant regulatory and permitting authority that needs to be notified of the installation, such as local fire districts?

5) Are there different safety requirements currently in place for solar PV that are not required for energy storage and that could be easily modified for application to storage projects? Examples may include clear labeling and accessible manual disconnects for emergency responders.

6) If the existing rules and procedures do not adequately address the safety impacts of energy storage, what are the appropriate roles of the CPUC, utilities, local government agencies or other state agencies to develop and implement improved safety standards? How can the CPUC help improve the coordination among the various agencies and permitting authorities involved to increase procedural efficiency?

7) Do existing rules and procedures address the use of used battery devices for energy storage? For example, if an electric vehicle battery is placed in service for stationary storage, will it be required to meet different UL certification standards?

IREC is pleased to provide its responses to certain of the questions contained in the

January 6, 2014 ACR.

**Question 1: Are there any safety or reliability concerns associated with the interaction of customer-side energy storage with the utility grid that are not currently being addressed through Rule 21?**

IREC is not in a position to broadly address at this time whether there could be *any* specific safety or reliability concerns related to customer-side energy storage that are not currently being addressed through Rule 21. However, in the Rule 21 proceeding, as well as in the recent proceeding at the Federal Energy Regulatory Commission (FERC), which considered updates to the Small Generator Interconnection Procedures (SGIP)[1], there has been some discussion regarding whether the existing rules are adequate to enable the utilities to review and safely interconnect storage systems. In neither proceeding did there emerge significant issues that prevent adequate review under the current rules, although the consensus appeared to be that further discussion may be warranted as more is learned about the new technologies and applications.

Both the new Rule 21[2] and FERC's SGIP update[3] did specifically include storage within the definition of generating facilities. The Commission also hosted a workshop on interconnection and electric storage in July of this year.

IREC would also suggest that the Commission may find it helpful to take a look at the efforts being undertaken in the State of Washington with respect to the interaction of customer-side energy storage with associated customer-sited generation in order to help

[1] FERC Order 792, at P.222 to 231 (Nov. 22, 2013) .

[2] Decision 12-09-018 at 22-23 (Sept. 13, 2012) and Revised Rule 21 at Section C ("Generating Facility: All Generators, electrical wires, equipment, and other facilities, excluding Interconnection Facilities, owned or provided by Producer for the purpose of producing electric power, including storage.")

[3] FERC Order 792, at P.222 to 231 (Nov. 22, 2013).

evaluate whether Rule 21 requires any enhancements. Partly as a result of an incentive program that encouraged an in-state inverter manufacture to develop a UL listed inverter to use with energy storage systems,[4] the state's regulated utilities have established metering guidelines for "Systems with Battery Backup." For the Commission's ease of reference, we have attached as Exhibit A to these Comments a copy of the Puget Sound Energy ("PSE") Production Meter Guidelines, which contain information on how to connect energy storage to PSE's distribution system.

We would note that over 5% of solar systems sited within the PSE service territory typically have an associated energy storage system.[5] In this regard, it is noteworthy that PSE's Guidelines do not suggest that there are any unusual safety or reliability-related metering or installation obstacles for systems with a generation capacity of 25 kW or less.[6] However, as seen in the attached Guidelines, PSE does impose some special production metering and wiring requirements for such installations.

**Question 2: If certified equipment is used, should any other protections be required that would prevent a customer from tampering with the equipment, potentially compromising the anti-islanding or other safety features installed on the device?**

Before addressing whether there are specific protections that could be used to prevent tampering, IREC believes it is worth pointing out that there is always a risk that customers will install a generating device or other equipment without notifying the utility,

[4] Washington Senate Bill 5101 (2005) (revising Wash. Rev. Code ch. 82.16); *see also* Wash. Admin. Code § 458.20.273 (providing additional detail regarding the incentive program); Wash. Dept. of Rev., Renewable Energy/Green Incentives, http://dor.wa.gov/content/FindTaxesAndRates/TaxIncentives/IncentivePrograms.aspx#Energy (State web site describing the program).

[5] *See,* PSE PowerPoint Presentation, "Solar Washington, " at slide 16. http://solarwa.org/sites/default/files/jake-wade.pdf.

[6] See page 1 of the attached PSE Guidelines.

or modify equipment in a manner different than that which the utility approved. There is no reason to believe, at this time, that this risk is any greater for customer-sited storage systems than for any other type of electricity-system-related installation. This does not mean that real safety or reliability issues could not be created as a result of tampering, but it may suggest a more modest regulatory approach initially. Installation of anti-tampering devices (to the extent they exist) may be costly and equally difficult to monitor.

As noted above, the prevalence of storage systems in Washington State has prompted some consideration of this issue. When the state adopted its incentive program, the utilities were concerned that there could be tampering that would allow such systems to take advantage of more incentive dollars than they might otherwise be entitled to receive. Rather than requiring physical protections from tampering, however, the Washington utilities have addressed this concern by carefully monitoring the energy production from the facilities that qualify for the incentives.[7] For example, PSE monitors solar PV production (on the basis of kWh/KW/month) and then normalizes the output of such units on a per kW basis with and without storage.[8]

Although there is a large production incentive, through the tracking and comparison of the expected output, PSE has not found sufficient evidence of tampering to justify requiring further anti-tampering measures.[9] Thus, in evaluating whether any additional protections should be required, the Commission should engage with its stakeholders to consider whether the steps taken in Washington in order to prevent

[7] Phone conversation between Michael Sheehan, consultant to IREC, and Jake Wade, PSE, Green Power and Renewables , on January 8, 2013.

[8] *See,* PSE PowerPoint Presentation, "Solar Washington," at slides 10 -11.

[9] Phone conversation between Michael Sheehan, consultant to IREC, and Jake Wade, PSE, Green Power and Renewables, on January 8, 2013.

customer tampering with the anti-islanding or other safety features installed on their generation and storage facilities might be worth adopting here.

**Question 4: As part of the Rule 21 interconnection application process NEM applicants are required to provide evidence of the final electric inspection clearance from the governmental authority having jurisdiction over the generating facility. Does this provision typically involve every relevant regulatory and permitting authority that needs to be notified of the installation, such as local fire districts?**

As stated in the question, the interconnection agreements only require that the applicant provide proof of the final electrical inspection clearance. This does not thereby include proof of any and all other permits that may be required. However, nor is it clear to IREC that the applicant should be obligated to provide the utility with proof of their compliance with law that does not touch on issues related to interconnection. Proof of compliance with other permitting requirements may be best left to the local authority responsible for overseeing those requirements.

**Question 6: If the existing rules and procedures do not adequately address the safety impacts of energy storage, what are the appropriate roles of the CPUC, utilities, local government agencies or other state agencies to develop and implement improved safety standards? How can the CPUC help improve the coordination among the various agencies and permitting authorities involved to increase procedural efficiency?**

Without venturing into the sometimes murky arena of state versus local jurisdiction of various aspects of electrical systems, suffice it to say that the electrical system in California is evolving rapidly. Thus, it should be a key interest of all regulatory bodies with some authority or regulatory oversight over the safety and reliability of the installation and operation of distributed electric generation systems to collaborate and develop a set of protocols to encourage the rapid dissemination of knowledge as new types of systems move from the stage of being experimental to being implemented in the field.

In this regard, IREC would encourage the CPUC to engage the Office of the State Fire Marshall to work collaboratively with the Commission, the utilities, storage companies and, ultimately, with local fire departments to assure that new combinations of distributed generation and electricity storage that will be coming onto the market in the near future will be subject to all reasonable precautions necessary to protect public safety. Some form of regular consultation between the Commission and the State Fire Marshall, with input from the utilities, to identify and share information about promising new technologies that may require specific safety reviews is probably the best overall strategy, as it will be unduly burdensome for the Commission to be obligated to reach out to every local fire department, and the State Fire Marshall's office has a great deal of experience and far better ability to conduct such outreach than the Commission.

In some cases, it may be advisable for the State Fire Marshall to propose specific guidelines for use by local fire departments in assuring the safety of new types of distributed generation plus storage, but in no event should the need for such guidance be assumed or pre-ordained. Rather, a thoughtful and open process of regular communication between the Commission and the State Fire Marshall's office should be successful in identifying, and developing any special requirements that should be implemented in connection with, new combinations of distribution system scale renewable generation plus storage that will continue to emerge.

**CONCLUSION**

IREC appreciates the opportunity to submit these Comments and encourages the Commission to take these comments into account as considers the safety issues that were

engendered by the various comments that it received on the October 17, 2013 ACR.

Respectfully submitted,

/s/
Laurence G. Chaset
Sky C. Stanfield
Keyes, Fox & Wiedman LLP
Counsel to the Interstate Renewable Energy Council, Inc.

January 8, 2014

# Exhibit A

PUGET SOUND ENERGY

**Metering Network Services**
P.O. Box 90868 SKC-TRC
Bellevue, WA 98009-0868

# INFORMATION FOR CONSULTANTS, CONTRACTORS, AND CUSTOMERS ON REAP METERING REQUIREMENTS

Puget Sound Energy (PSE) is developing a standard for the installation of Production Meters for customer-owned renewable generation systems as defined by WAC 458-20-273 (formerly Senate Bill 5101) and PSE Electric Tariff G Schedule 151 Renewable Energy Advant age Program (REAP). In the interim as this new standard is being developed, the following guidelines are intended to help consultants, contractors, and customers understand the requirements of the State and PSE for Production Meters used for REAP.

The Production Metering used for REAP is PSE-owned, revenue-grade metering, and therefore is subject to the same State and Federal laws, Utility Commission Requir ements, PSE Construction Standards, and PSE Audit and Quality Control Standards to which all other PSE revenue meters are subject. These requirements are typically more significant than what is needed for basic production metering used for "green tag" programs or general monitoring of a system.

These guidelines from the PSE Metering Department apply to single-phase 120/240V systems typical of those installed on residential services. Systems with three-phase output or with a generation capacity greater than 25 kilowatt (kW) may have additional requirements and are evaluated on a case-by-case basis and are not covered by these guidelines.

Please contact Jake Wade, PSE program implementer, Green Power and Renewables, at jake.wade@pse.com or 425-462-3459 with any questions. Fax: 425-456-2706

## Guidelines and Common Issues for REAP Production Metering

### Production Meter:

PSE will provide and install the Production Meter. Although some standard renewable generation and inverter packages contain a utility type watt-hour meter as part of the included equipment, a customer-supplied meter cannot be used for the REAP program.

### Meter Socket:

The customer will provide, install, and wire a meter socket for Production Metering. Most standard systems will use a 240VAC connection with a 4-jaw socket, and PSE will install a Form 2S standard meter. Systems with battery backup may require more complex metering (see below). When wiring the meter socket, the "line" connection will be from the inverter and the "load" connections will be to the AC panel.

The meter socket must meet PSE requirements as detailed in Chapter 6 of the PSE Residential Service Handbook, which is available online at:

*http://www.pse.com/solutions/buildersHandbooks.aspx*

*Please note that the six-inch round "pancake j-box" type meter socket that is included in some kits or standard designs for green-tag metering does not meet PSE meter socket requirements. Readi available standard meter sockets typically used for 100A overhead services (approximately 8"x11"x4" boxes) generally meet PSE requirements.*

## Meter Location:

The PSE Production Meter must be located outdoors and adjacent (minimum of 10 inches and maximum of 6 feet) to the existing PSE Service Meter. All other *Location Requirements*, *Grounding Requirements*, and *Clearance Requirements* for the PSE Production Meter are identical to those for a PSE Service Meter. These requirements are detailed in Chapter 6 of the PSE Residential Service Handbook.

PSE Meter Engineering will consider variance requests for alternate Production Meter locations in the rare situations where locating adjacent to the existing service meter is truly impractical or cost prohibitive. A variance for an alternate Production Meter location must be obtained prior to construction. Please contact Jake Wade for information on the variance process.

*An example of where PSE Meter Engineering may allow a variance for an alternate Production Meter location is when the service meter is located at the main house, and the renewable generation equipment is located on a detached garage or outbuilding. In this case PSE Meter Engineering would likely allow the customer to locate the Production Meter on the exterior of the outbuilding as long as all other requirements for meter location, clearance, and access are met.*

*Please note that the PSE Production Meter must always be located outdoors and in a location readily accessible to PSE personal; variances to allow indoor meter locations cannot be issued.*

## Systems with Battery Backup:

Systems that incorporate battery backup usually require more complex Production Metering. The most common battery backup systems typically use a 120VAC inverter/charger unit that has two isolated AC connections: one to the main AC Panel and the "grid", and the other to a separate subpanel for the "backed-up" loads.

Production Metering of such a system typically requires a 5-jaw socket (with the 5th jaw in the nine o'clock position), and PSE will install a Form 12S advanced meter. This is an unconventional use for this meter socket and meter form factor (normally used for 120/208V network service), but it provides the most economical way to meter the complex two circuit bi-directional 120V system.

If the system is 240VAC (typically accomplished by "stacked" or parallel 120VAC inverters), then two meters are necessary for Production Metering. (one for each 120VAC system).

Outback Power Systems® provides a diagram showing the wiring of the 5-jaw socket and a description of the metering for such a system at:

http://www.outbackpower.com/pdfs_general/Form%2012S%20Green-Tag%20meter.pdf

*Please note the following PSE clarifications for this diagram:*

- *The diagram is titled "Green-Tag KWH Metering", but PSE will accept this arrangement for REAP Metering as well.*
- *The diagram provides a watt-hour part number, but this can be disregarded as PSE will provide the meter.*
- *The diagram is for a single 120VAC inverter. 240VAC systems will require two meters.*
- *The diagram does not show disconnects or protective devices that may be required by NEC or local codes. Regardless of code requirements, PSE requires an accessible AC disconnect for all systems over 5kW or for current transformer metered services (refer to PSE Schedule 150).*
- *There are other equipment manufacturers who have similar systems and connect and meter generator output in a similar manner. PSE does not endorse any one manufacturer over another.*

Systems with Standby Generators:

Standby Generators may or may not complicate the Production Metering depending on how the system is configured. A careful design and review of these systems are necessary to make certain the Production Metering for REAP registers only the production from the renewable source under all operating conditions.

Review and Approval by PSE Meter Department:

PSE's Meter Engineers review all applications for Net Metering and Production Metering for REAP. Please submit detailed and accurate system diagrams to help accelerate the review; incomplete or inaccurate diagrams and system information delay the review and approval process.