[Submitter 4]

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Illinois Power Agency
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RE: SPV RFP Comments

On behalf of the [Submitter 4], thank you for the opportunity to submit comments regarding the SPV RFP. After reviewing procurement documents and attending the public workshop on April 14th, there are two topics of concern, the requirement of revenue grade meters (RGMs) for sub-25kW systems and confirmation of a Qualified Person.

REVENUE GRADE METERS

The IPA is charged with the dual responsibility of procuring the lowest cost REC while minimizing risk exposure for REC payments. Although many states currently require RGMs to confirm performance metrics, the additional expense, labor and physical resources to purchase and install the device will increase installation costs and drive up REC prices disproportionately to the risk of over compensating for REC generation. For small PV systems, existing inverter and monitoring equipment can reliably provide the necessary information within a reasonable accuracy, ensuring the IPA can manage large scale REC procurement with minimal risk and exposure while delivering the lowest price REC to the market.

The US DOE has implemented a variety of effective programs to successfully drive down the installation costs, ensuring clean energy technologies are increasingly affordable and available in all markets. The requirement by the IPA to add additional equipment that is redundant for small arrays is counter to this effort.

We agree with Mr. Granahan's comments on April 14th that this requirement would not cause a competitive constraint as all systems would be held to this standard. However, the issue is the lack of balance between increased market and REC cost and avoided risk.

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Impact on Installation Costs:

The following table demonstrates sample pricing for RGMs and the percent increase in solar array installation costs. As shown below, adding an RGM can increase the installed cost by between 3% to 8% for smaller arrays and 1.2% to 2% for larger arrays. This is a significant burden for small arrays that could use inverter and/or monitoring equipment readings to report performance.

Table 1 - Sample RGM Pricing:

Make/Model	Equipment & Labor	% 3kW	% 6 kW	% 15kW
Enphase RGM Meter	$ 1,025	8%	4%	2%
LGate 101E	$ 1,094	8%	4%	2%
LGate 120	$ 700	5%	3%	1%
Solar-Log 350	$ 950	7%	4%	2%
Refurbished Mechanical Meter	$ 400	3%	2%	1%

*Assumptions:
3kW Installation Cost $13,500 ($4.50/watt), 6kW Installation $25,500 ($4.25/watt), 15kW Installation Cost $56,250 ($3.75/watt)

A study conducted by the New Jersey Clean Energy Program[1] showed similar pricing, although it did not report percent increase on project costs, a critical part of the analysis. Average pricing shown was $645, which increases the total installation cost for smaller systems by as much as 5%.

> At the request of the BPU, the Market Manager has conducted an informal survey of entities that are currently providing a service to install revenue-grade meters for residential solar projects. The surveyed price range for a basic meter installation was found to be from $350 to $900 with an average price of $645. Meters with advance capabilities such as remote reading are available from $1,250 to $2,500. A summary of the survey results is available at the link below. Meter service providers that wish to be included on the survey results are required to fill out the Meter Installation Survey and Permission Form available at the link below and should submit the completed form via email to the Market Manager at NJREINFO@csgrp.com.[1]

[Submitter 4] considers this to be a significant increase to the component costs for installations, particularly for small systems. As inverter readings or monitoring equipment are readily available, the IPA should accept alternate sources of performance data at a minimum for systems under 15kW systems, likely the bulk of the sub-25kW category for IPA procurements.

Impact on REC Price:

As referenced previously, there is a great disparity between a 5kW system and a 25kW system net increase in system costs due to RGM requirements. Assuming the cost of for the RGM is $645, REC pricing for a 5kW system would increase by $22.63 per REC over 5 years to recover the expense, while a 25 kW system only needs $4.53. (See Table 3.)

[1] http://www.njcleanenergy.com/renewable-energy/programs/metering-requirements/production-meter-requirements-solar-projects-srecs

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Conversely, calculating the total amount of RECS that could be falsely generated or not generated by using inverter data vs RGM data is potentially a 3% variance. If taken over a 5-year period, the net result is less than potentially 1 REC over 5 years for a 5kW system. For a 25 kW system this is potentially an additional 4.5 RECS over 5 years. This means that the cost per avoided falsely generated REC over 5 years is approximately $725 per REC on a 5kW system and $144 on a 25kW system. Again, this is an excessive amount to pay for a small accuracy improvement, especially in systems under 10kW.

Table 2: REC Price Impact

System Size	Annual REC	5 Year REC	(=/-) 3% Accuracy	Meter Cost/REC	$ per inaccurately generated REC
5 kW	6	30	0.9	$ 21.50	$ 726.67
10 kW	12	60	1.8	$ 10.75	$ 363.33
15 kW	18	90	2.7	$ 7.17	$ 242.22
25 kW	30	150	4.5	$ 4.30	$ 144.33

* Assumes a 1.2 production factor and a $645 RGM cost.

Loss Mitigation:

The following table illustrates the potential impact of increasing monitoring accuracy from standard inverter or monitoring readings of (+/-) 5% to RGM readings of (+/-) 2% (ANSI standard).

Table 3: Risk Analysis

Accuracy	Minus 5%	Minus 2%	Actual	Plus 2%	Plus 5%
System Size	4.0	4.0	4.0	4.0	4.0
Annual Production (kWh)	4,600	4,720	4,800	4,880	5,000
# of RECs	4.6	4.72	4.8	4.88	5
REC Price	$300	$300	$300	$300	$300
REC Revenue	$1,380	$1,416	$1,440	$1,464	$1,500
Over/Under Compensation	-$60	-$24		$24	$60

* Assumes a 1.2 production factor and a $645 RGM cost.

Translating the difference between 2% and 5% accuracy into a REC price, even if assuming a very high REC value of $300, is (+/-) $36 for a 4kW array. If compared to the average increase in installation costs of $645, the additional incremental costs is not justified by the potential for an artificially high reading. It

should be noted also that a (+/-) tolerance presumably yields an equal chance of a system owner being under-compensated as there is of being over-compensated.

Redundancy in Equipment:
Inverter-based monitoring systems included with most PV installations typically have manufacturing specifications of (+/-) 5% accuracy. For example, a common residential PV system configuration uses Enphase microinverters and monitoring. The system includes inverter based solar AC output monitoring, which is accessible online to the homeowner, installer, and if necessary, an SREC aggregator. As such, to add an RGM to the PV architecture imposes significant additional cost that is duplicative of inverter-based monitoring systems that are already commonly included with most arrays.

Additional Concerns:
In addition to expense, requiring RGMs imposes other concerns, including:

1) The resource consumption footprint will increase with additional use of raw materials, manufacturing and shipping.
2) Reporting production readings from either the RGM or an inverter will continue to be a manual process, subject to error and inaccuracy. Including an RGM will not lesson that risk.

Precedence:
As previously submitted during the comment period for the Supplemental Procurement Final Order, several states have opted to require revenue grade meters for all systems. However, Maryland currently allows for estimation of production from a default factor for small systems and Pennsylvania does not require revenue grade meters. Additionally Ohio exempts systems under 6kW from needing revenue grade meters. Therefore, there is precedent for Illinois to set standards for sub-25kW arrays that allow use of inverter-based monitoring.

Conclusion:
[Submitter 4], representing the input from several installers in Illinois, requests that the IPA allow multiple methods for reporting performance data for sub-25kW arrays. Due to the disproportionate impact on installation cost, the low level of risk over a 5-year REC period, the impact on REC prices to recover the cost of the RGM and the redundancy of equipment in the final design, inverter readings or monitoring

equipment should be an acceptable solution when an RGM is not installed. At minimum, [Submitter 4] requests these parameters be available for systems <10kW within the PJM territory.

In the event that the IPA rules RGMs are required for all systems, [Submitter 4] requests special consideration and release from such requirements be offered for installations completed between January 21st and the date of the final determination of system requirements given the discrepancy from language in the Supplemental Procurement Final Order on January 21, 2015.

QUALIFIED PERSON

Per the conversation during the April 14th SPB RFP Workshop, not all tasks related to the installation of a DG PV installation must be conducted by a "qualified persons". Specifically, tasks such as delivery of equipment, layout and installation of racking and panels and similar activities can be completed by other employees.

Respectfully submitted on behalf of the [Submitter 4],

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