



---

## MAINE ENERGY INVESTMENT CORPORATION

April 10, 2006

### “SolarCents” Technical Note on Metering for RECs

The metering requirements are the most challenging aspect of “SolarCents” participation for Maine owners of existing PV systems<sup>1</sup>. The reason stems from Maine’s net metering rules and the manner of their implementation by local distribution utilities. Under the net metering rules, the utility places two meters on each PV system. One meter measures the power flowing from the grid to the home, while the second meter measures only power going from the home (and PV system) back into the grid. Customers with on-site generation then pay only the “net” difference between these two meter readings. This is equivalent to “spinning the meter backward”.

Yet, due to the placement of these two meters by Maine utilities, neither meter records the full output of the PV system. As a result, a basic system requirement before RECs can be sold is not accomplished by either meter.

To qualify to sell RECs, PV systems must meet two criteria:

- 1. PV output must be accurately measured** -- The meter must be located so that it meters *only and completely* the output of the PV system. Because this does not happen with most Maine net-metered systems, a third meter may be necessary to qualify your PV system to accurately measure system performance and therefore qualify for RECs.
- 2. The PV performance measure must meet high standards of accuracy** -- The meter measuring the PV output must have been certified as meeting standards as “utility grade” or “revenue quality”. This means that the meter performs with sufficient accuracy and reliability to allow financial transactions to rely on its results. The common mechanical “utility” meter meets these requirements.

#### 1. Metering PV System Performance

The allocation of RECs to your system is done on the basis of system performance. For every Megawatt-hour (MWh, or 1,000 kWh) of electricity produced, the NEPOOL GIS system will award one “renewable energy certificate” that recognizes the attributes of that specific quantity of electricity. As RECs are awarded on the basis of MWh not kWh, most residential sized PV systems (i.e., 1.0 – 3.0 kW systems) produce relatively few MWh per year. Because NEPOOL GIS will not award RECs to any fractional MWh of production, aggregations like “SolarCents” are really the only

---

<sup>1</sup> This became apparent in the “DSC Feasibility Study” completed by MEIC in 2004.

practical way that most residential PV owners will be able to secure any REC revenue from their systems.

Accurate, consistent and reliable measurements of actual PV output are critical to the ability of the GIS system to award RECs. Because meters installed for net-billing purposes are placed without regard for the need to measure PV performance, most Maine PV owners will be required to have a separate way of measuring PV output. Some PV owners will have installed data recording devices when their systems were originally installed, just for their own information and ability to monitor PV system performance. Call DSC to discuss whether such additional meters /performance monitoring equipment will meet the metering quality requirements (see below).

When evaluating your metering system for “SolarCents” participation, examine the following characteristics<sup>2</sup>. The meter must:

- Record the system’s AC output, as measured on the AC side of the system isolation transformer.
- Separate from the utility billing meter and not interfering with the utility billing or net-metering process in any way.
- Be a standard utility “revenue quality” meter that confirms to applicable American National Standards Institute (ANSI) C-12 standards, and installed on the output side of the system’s DC-to-AC inverter or isolation transformer.
- Have a visible display of cumulative energy produced by the PV system and be available for periodic testing and/or recalibration, if necessary.

## 2. Ensuring Meter Quality

Meters that meet the ANSI C-12 standard as “revenue or utility quality” have several specific features. These meters will have been tested and certified as tamper-proof, accurate and reliable under a broad range of conditions.

- **Tamper-proof** – A key feature of a revenue quality meter is a means of recording the historical energy flowing through the meter that cannot be reset or tampered with. Similar to an odometer in a car, the registry feature of the meter provides the official reading at any point in time, and as such, it trumps any other recorded measurements.
- **Accurate** – Accuracy standards for these meters have been established in accordance with national standards testing bodies, for both mechanical and solid state meters (see table).
- **Reliable** – “Revenue quality” meters are tested under an array of adverse conditions to demonstrate their accuracy within very tight margins of error. Individual meters will have been

---

<sup>2</sup> Drawn from “Minimum Technical Requirements for Renewable Energy Installations”, Massachusetts Technology Collaborative.

tested before shipment, to ensure correct calibration. Used and reconditioned meters must also be recertified as “revenue quality”.

Many Mainers with net-metered systems may have inverters that track system performance. Regrettably, these units are generally not ANSI C-12 compliant. The reason stems from the “tamper-proof” and “reliable” requirements – inverters may have the ability to provide a historical record of energy production for a specific period. More likely, the memory in the inverter is such that, if/ when any power outage occurs, historical data is lost. The absence of sufficiently reliable memory will disqualify the inverter from providing the degree of accuracy over time that is a prerequisite to the award of RECs.

Fortunately, reconditioned mechanical utility meters are available at reasonable prices, generally under \$100. Be sure to work with your installer and/or electrician to be sure that the meter is installed on the output side of the inverter or isolation transformer. Customers considering the addition of a new PV system have the opportunity to specify **now, as they purchase** metering that **does** meet ANSI C-12 requirements.

### 3. Pick the Right Meter

Qualifying to sell your RECs, then, comes down to having the right meter in the right place. When specifying the PV performance meter, be sure to look for one that meets these requirements. As a general rule, manufacturers that take the trouble to get their meters tested to any of these standards will ensure that this certification is clearly specified in the marketing literature. If an appropriate certification is not readily visible, double check with the manufacturer. When in doubt, move on to a meter that is clearly certified. Both mechanical and electronic meters can meet this standard. Look for meters labeled as complying with the following standards:

ANSI C-12.1-1995	Code for electricity metering
ANSI C-12.10-1997	Mechanical meters
ANSI C-12.20-1998	Solid-state meters

Any electrical supply house can recommend a standard “utility grade” meter. Or ask the utility company in your area what mechanical meters they use. Both rebuilt and new meters, mechanical and solid state, are available that meet the ANSI C-12 standards. Ask your local electrical supply house and/or go online to sources like:

- Brand Electronics, Whitefield, ME ([www.brandelectronics.com](http://www.brandelectronics.com)) – Their external Power Meter is ANSI C-12 compliant, as may be other models at this site.
- Hialeah Meters, Hialeah, FL ([www.hialeahmeter.com](http://www.hialeahmeter.com)) – Many models available, both new and reconditioned. Be sure to verify that any reconditioned units have been recertified to ANSI C-12

standards.

Whatever your source, make sure to specify that the specific meter you buy – the specific unit—has been tested and certified as meeting the standards of ANSI C-12. Some manufacturers will say that their units are “capable of” meeting these standards, but unless the individual unit you buy has been properly calibrated and certified, you have no guarantee that the accuracy levels needed for REC sales will be reached. A clearly certified meter is your best protection.

**N.B. “SolarCents” caveats.** Because accurate PV performance measurement is such a core part of making sure that the resulting RECs are valid, MEIC reserves the right to conduct onsite inspections of any “SolarCents” participant installations as needed, and /or to terminate participation in “SolarCents” until eligibility (i.e., proper metering) is established. If “SolarCents” participants’ meters are subsequently found to be ineligible, any RECs that may have been previously reported will be invalid.