Metering Procedures for PA 11-80
Renewable Energy Credits
(MPREC)
1.0 Introduction:

A Facility must follow the metering specifications in Tables 1-1 and 1-2 in Attachment 1 “Approved Metering Equipment” below. Table 1-1 associates the facility size with a “meter group” for EVERSOURCE Meter Engineering (herein Meter Engineering; also the reviewing engineer) to cross reference when specifying a meter type to the Seller for the facility. Table 1-2 specifies permitted meters within each meter group, the meter communications, and meter testing requirements for each meter type. If a meter is specified that is instrument rated (Class 10 or 20), the facility must also install metering current and / or voltage transformers as outlined within Section 3.0 below.

It should be noted to Sellers that this procedure is subject to change. Meter Engineering will specify a meter based on the most current EVERSOURCE metering requirements and equipment.

2.0 Specifying a Meter:

Table 1-2, found in Attachment 1 of this document, lists the only meters permitted for use as the REC meter for LREC and ZREC facilities. Meter Engineering must specify a meter from Table 1-2 based upon Facility classification within Table 1-1. Unless otherwise noted in the table, a Seller may request a meter within Table 1-2 not specified during the Meter Engineering review, provided that Table 1-1 permits the use of that Meter Group for the Facility; use of the substitute meter will be at the sole discretion of Meter Engineering. An internal review conducted by Meter Engineering will take place prior to additions or subtractions to the equipment within Table 1-2.

When classifying a facility, the reviewing engineer (unless otherwise noted, the “reviewing engineer” throughout this document is referring to the Meter Engineering engineer) should consider aggregate generation behind one customer revenue meter during the review even if the other generation on site is not part of the LREC and ZREC program. If the LREC/ZREC facility is impacted, or impacts other existing generation contracts, this condition must be remediated prior to REC metering approval. This could include specifying and requiring the addition of meters on other on-site generation as permitted by Attachment 1 of the participant’s LREC/ZREC Standard Contract.

If information is provided by the applicant about additional programs they are participants of that also require a production meter, Meter Engineering will incorporate these requirements, when possible, into the LREC/ZREC REC metering specified during the review. If no additional information is provided, or the applicant requests to keep the LREC/ZREC metering separate, Meter Engineering should consider only the LREC/ZREC requirements during the review.
2.1 Project Review Process

When conducting the review, the reviewing engineer must consider all of the following documents before approval can be made:
1. One-line drawing
2. Three-line drawing
3. Site Plan
4. Data sheets for current transformers (CTs) showing ratios as well as accuracy class and burden
5. Data sheets for potential transformers (PTs) showing ratios as well as accuracy class
6. Data sheets for generation equipment
7. Generator voltage
8. Generator nameplate rating
9. CT/PT serial numbers
10. Communication Method (Ethernet, Cell, POTS, etc…)

NOTE: Refer to Attachment 2 for generation less than 500kW and Attachment 3 for generation equal to or greater than 500kW

After the documents are received, the reviewing engineer will review the following from each document:

Site plan:
Verification of alternating current external disconnect switch (AC EDS) location, all on-site generation including non-LREC/ZREC generation, REC and Revenue meter locations.
When considering REC meter placement, the reviewing engineer should consider the communication medium of the meter and make appropriate recommendations to mitigate potential communication issues (e.g. For an ERT (Drive-by)/Cell based meter, the meter should be outside with an unobstructed view of the road. If the customer at the project site already has an existing ERT/Cell based revenue meter, it may be logical to locate this REC ERT/Cell meter in a close proximity to the existing ERT/Cell meter as we are already able to communicate with it).

One Line:
The one line drawing should clearly show the output of the inverter correctly connected to REC meter and correctly connected into the Seller’s facility without any load, other than generation equipment parasitic load, to the generator side of the REC meter. Additionally, the reviewing engineer will ensure that no other on-site generation will impact the accuracy of the REC meter and also that the REC facility will impact any other on-site generation.

Battery backup systems shall not be permitted to be installed on the generator side of the REC meter if the equipment is capable of charging said batteries from the utility connection. The reviewing engineer is to assume that all battery backup systems are capable of being charged by the utility connection unless:
a) The manufacturer data sheets provided by the participant specifically state that the system will not charge from the utility feed;
b) The participant obtains a statement from the manufacturer that the inverters will not charge from the utility feed;

Three Line:
Self-contained Service Metering
The three line drawing should clearly show a self-contained meter socket wired in a top down configuration – the top or line side “jaws” should be wired to the generator and the bottom or load side jaws should be wired to the customer’s load.

Instrument Transformer Rated Metering
For instrument transformer rated metering, the CT polarity marks should be facing away from the generator, pointing towards the customer’s load and the EVERSOURCE revenue meter. Additionally for instrument rated metering, the reviewing engineer should ensure a meter test switch is present and correctly wired.

Although it may be conducted at the same time, please keep in mind that this is not a review for interconnection; however, the reviewing engineer should consider the impact to the REC metering due to any changes that may need to be made for the participant to be compliant for interconnection and should not offer final REC metering approval until the Meter Engineering review of interconnection has been completed. Distributed Generation Interconnections will not be denied for issues with the REC metering unless they also impact the interconnection process. The reviewing engineer should allow the facility to begin procurement of metering equipment even if there are concerns with wiring configurations.

Additionally, regarding review of all drawings, the reviewing engineer should consider the current revision of the “EVERSOURCE Information and Requirements for Electric Supply below 600 volts,” (I&R book), and the participant should once again be informed that EVERSOURCE personnel will not be permitted to access any metering equipment not in compliance with the EVERSOURCE I&R book; this includes access to probe for missed meter reads. The I&R book can be accessed at [https://www.eversource.com/Content/docs/default-source/ct---pdfs/yellowbook.pdf?sfvrsn=2]. The reviewing engineer should strongly advise that the meter is installed in sufficient time to program, test functionality, and test communications prior to the participant’s expected date of in-service.

Following review and prior to in-service, the participant must notify the interconnection project manager (Distributed Resources) that the REC meter has been successfully installed and is ready for programming (when applicable) and/or commissioning. At this time the following information should be relayed to the reviewing engineer as specified:

1. Static IP addresses or dedicated analog telephone line numbers
2. Final verification of installed CT polarity markings
3. Meter Serial numbers
2.2 REC Meter Procurement

Seller/participant shall not attempt to procure a meter prior to receiving procurement instructions from the reviewing engineer. Even if the participant has purchased the correct meter model number, it may not be configured in accordance with an Eversource CT standard program template. In addition, it is possible that the participant may have purchased a meter no longer available, based on a previous revision of this document. Based upon the reviewing engineer’s selection of meter for the facility, the procurement process may vary. In general, for ERT and cellular based meters, as well as some others, procurement will be available through the Eversource CT Meter Lab to ensure the meter is programmed properly for our data collection systems. Other meters may be available directly from the manufacturer and the participant should be provided a product key number and contact information to complete the procurement process on their own.

3.0 Instrument Transformers

Instrument transformer rated meters will require Current transformers (CTs) that must be 0.3% metering accuracy class with a burden rating that is greater than the metering circuit burden rating in order to maintain metering accuracy and may require Potential transformers (a.k.a. voltage transformers) (PTs/VTs) that must also be 0.3% metering accuracy class with a burden rating that is greater than the metering circuit burden rating. Please see Attachment 1, Table 1-3 for a list of permitted instrument transformers. No split core or multi ratio CT’s will be permitted. EVERSOURCE CT requires the lowest ratio and highest rating factor CT’s for maintaining accuracy over all ranges of generation.

4.0 Other Requirements and Information

4.1 Safety

Safety is always the primary concern in every installation. If the designer of the facility has not followed the current revision of the “EVERSOURCE Information and Requirements for Electric Supply below 600 volts,” it should be noted on the comments to the applicant that EVERSOURCE personnel will not be permitted to service or test any of the REC metering equipment on behalf of the Seller, including probing the meter for missed reads.

4.2 Data Collection

In accordance with the deadlines of NEPOOL REC creation, following each quarter of production, monthly data will be verified and submitted by EVERSOURCE to the NEPOOL GIS (herein “the GIS”) at the end of each quarter. Monthly data will not be reported immediately following production to ensure all data has been validated prior to submitting to the GIS.
Reads will be obtained from the meter at a minimum of a monthly basis. In the instance of a missed read, the Seller should be contacted by the LREC/ZREC contract administrator as soon as being notified that a read is unavailable and inform the Seller to coordinate a check for basic functionality of the meter. In the event that EVERSOURCE systems are unable to re-establish meter communications, the Seller shall coordinate with EVERSOURCE to obtain a valid read. If historical data must be obtained directly from the meter, in order to avoid losing production data, the meter data must be obtained prior to internal data overwrite within the meter (typically less than 30 days but may vary depending on meter type and programming). Production shall not be estimated at anything other than zero; therefore, if a read is not obtained, before a loss of data, no RECs will be created for that period.

In the event it is determined the meter will need to be repaired or replaced it is the responsibility of the Seller to make all such replacements or repairs. This shall be coordinated with Meter Engineering and will require a new REC meter review in accordance with the most recent revision of this document. Depending on meter type and availability, EVERSOURCE may be able to provide a temporary meter during warranty repairs of REC meter.

4.3 Initiating a review or a request for information

LREC/ZREC meter requests for information should be sent to the Distributed Resources interconnection project manager assigned to the project during the interconnection review. The project manager should be copied on all communications between any parties.

4.4 Meter program may not be manipulated under any circumstance

The customer owned REC meter, once programmed by Eversource, shall not have its meter program be manipulated or modified in any way after Eversource programming has occurred. This includes, but is not limited to, modifying the internal or external voltage transformer (VT) or current transformer (CT) ratios, changing any of the internally programmed REC meter fields, tampering with the REC meter or associated wiring of the REC metering loop, or any other activities that may be perceived to be malicious in any manner. Manipulation of the REC meter wiring or program under any circumstance, maliciously intended or not, is strictly prohibited. Also, once the REC meter is programmed by Eversource, the changing of the VTs or CTs themselves, with resulting VT and / or CT ratio changes, is prohibited without first notifying Eversource. If any values within the REC meter do not appear correct, please contact Eversource.
Attachment 1: Approved Metering Equipment
Table 1-1: Facility Size-Meter Specification Cross Reference

<table>
<thead>
<tr>
<th>Facility Size</th>
<th>Meter Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 to &lt;20kW</td>
<td>A, B</td>
</tr>
<tr>
<td>&gt;=20.0 to &lt;50 kW</td>
<td>A, B</td>
</tr>
<tr>
<td>&gt;=50.0 to &lt;100 kW</td>
<td>A, B</td>
</tr>
<tr>
<td>&gt;=100kW to &lt;500 kW</td>
<td>A, B</td>
</tr>
<tr>
<td>&gt;=500 kW to &lt;=2 MW*</td>
<td>B (Ethernet only)</td>
</tr>
</tbody>
</table>

*Level 4b Metering will be specified by the reviewing engineer any time aggregate generation behind one customer revenue meter equals and/or exceeds 500kW.

Table 1-2: EVERSOURCE Approved LREC and ZREC Meters

<table>
<thead>
<tr>
<th>Form</th>
<th>Manufacturer/ Model</th>
<th>Product Key</th>
<th>Class</th>
<th>Communications</th>
<th>Testing Frequency(years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2S, *5S, *9S, 12S, 16S</td>
<td>**Centron 3 ERT</td>
<td>CxSLZREC</td>
<td>20/200/320</td>
<td>High Powered ERT</td>
<td>16</td>
</tr>
<tr>
<td>*9S</td>
<td>*Elster</td>
<td>Varies</td>
<td>20</td>
<td>Modem</td>
<td>16</td>
</tr>
</tbody>
</table>

* Instrument rated form types (CT’s and/or VT’s required)

**This meter type is the preferred meter type for facility sizes between 0 to <500kW and must be specified to the participant seeking a meter within these groups unless it is deemed by the reviewing engineer to be unsuitable for the project. Please note the lower case “x” in the EVERSOURCE CT product key should be replaced with the ANSI form number.

Group B

<table>
<thead>
<tr>
<th>Form</th>
<th>Manufacturer/ Model</th>
<th>Class</th>
<th>Communications</th>
<th>Testing Frequency(years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>***9S flush mount &amp; socket type</td>
<td>ION 8650</td>
<td>Provided during review</td>
<td>Ethernet, Modem</td>
<td>16</td>
</tr>
</tbody>
</table>

***Other Forms may be available upon request
Table 1-3: EVERSOURCE Approved Instrument Transformers

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Rating</th>
<th>Rating Factor</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Window</td>
<td>Any*</td>
<td>Any*</td>
<td>Any*</td>
<td>Any*</td>
<td>Must meet requirements of current version of ANSI C12.11, must be 0.3% accuracy class, and all transformers must have a burden rating that does not impact the metering accuracy.</td>
</tr>
<tr>
<td>Bar</td>
<td>Any*</td>
<td>Any*</td>
<td>Any*</td>
<td>Any*</td>
<td>Must meet requirements of current version of ANSI C12.11, must be 0.3% accuracy class, and all transformers must have a burden rating that does not impact the metering accuracy.</td>
</tr>
</tbody>
</table>

*EVERSOURCE does not have a preference of manufacturer or model and will accept any window or bar type CT that meets the requirements as specified by the current revision of ANSI C12.11 and this document. No split core or multi ratio current transformers will be permitted. The company desires the lowest ratio and highest rating factor to maintain accuracy over all ranges of generation.
Attachment 2 - Customer Owned Meters
LREC/ZREC – Single/Polyphase less than 500kW – Non Revenue Meters

Per Section 6.1 of the LREC/ZREC Agreement a REC Meter is required. The REC meter is in addition to your revenue meter and any monitoring system (i.e. DECK) you may have on site

LREC / ZREC Metering Guidelines:

1. The LREC / ZREC customer is responsible for all costs associated with purchasing, installing, maintaining, and testing of all metering equipment and ongoing communications between the customer owned meter and Eversource.

2. Metering Options (refer to Metering Procedures for LREC/ZREC Projects - https://www.eversource.com/Content/ct-c/residential/save-money-energy/renewable-energy-credits/, Attachment 1 Table 2.1 & 2.2). The following types of meters shall be purchased through Eversource to minimize material lead times, to ensure proper programming and configuration within Eversource’s asset and data collection systems.
   a. Itron Centron – Encoder Reading Transmitter (ERT) meter – read by Eversource van.
   b. Itron Sentinel or L+G Focus Cellular Meter
   c. Itron Sentinel Modem Meter
   d. Elster Alpha 3 Modem Meter

3. All metering equipment shall conform to the newest version of revenue metering American National Standard Institute (ANSI) C-12 standards. All revenue metering instrument transformers shall conform to the latest applicable ANSI C57.13 standards and adhere to Eversource accuracy requirements.

4. All metering installations with instrument transformers require a test switch. Any 480 volt metering installations should be stepped down to 120 volt before the test switch for safety considerations. When applicable, the meter auxiliary power supply should also be at 120 volts.

5. The metering equipment, wiring diagrams (one-line, three-line and site plan), and design must be submitted to and approved by Eversource prior to installation.
   a. The meter shall be located at a point where the generator output is AC.
   b. The system design should - be such that the meter socket remains energized at all times regardless of whether generator is online or offline.


7. For each meter installation the following documentation is required to be submitted to Eversource for approval:

<p>| A | A three line drawing showing the meter connections to the Generator. |
|   |   1. Self - contained meters shall have the line side of the meter connected to the generator/inverter.   |
|   |   2. Instrument transformer rated meter must have the CT polarity marks pointing towards the Eversource revenue meter.   |
| B | When applicable, a data sheet for CT's showing they are 0.3% metering accuracy class with burden rating that is greater than the burden of the metering circuit. |
| C | The REC meter will be the only device connected to these CT's. |
|   | As built verification that the CT polarity markings are facing away from the generating system, and are pointing towards the Eversource revenue meter. |
| C | When applicable, a data sheet for PT's showing they are 0.3 % metering accuracy class. |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>D.</td>
<td>CT and/or PT ratios</td>
</tr>
<tr>
<td>E.</td>
<td>Generator voltage</td>
</tr>
<tr>
<td>F.</td>
<td>Generator <strong>nameplate</strong> AC kW rating (not LZREC contract capacity)</td>
</tr>
<tr>
<td>H.</td>
<td>A site plan identifying the location of the LZREC (customer owned) meter shall be provided.</td>
</tr>
<tr>
<td>I.</td>
<td>Indication of meter preference must be provided to Eversource along with contact and shipping information where Eversource will ship the meter when ready for installation. Please also include an anticipated installation date for the meter (should be prior to the start-up date of the generator).</td>
</tr>
</tbody>
</table>

8. **Steps Required for REC Meter Requests and Installation Validation**

<p>| | |</p>
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</table>
| A. | Once the REC meter is installed and generating, send an email to **MeterEngineering@eversource.com** with the “L/Z REC Meter Validation Form”, completed, for all ERT meter types (VAN Read). Use the following format in the subject header in email:
  
i. **Subject: REC Meter Validation Request & Address of project**

  For all non-ERT meter types, send an email with subject header requesting validation.
  
i. **Subject: REC Meter Validation Request & Address of project**

| B. | **EVERSOURCE** Meter Engineering will provide an email confirming REC meter requirements have been satisfied. (NOTE: This email will satisfy item number 5 on the Certification Statement for REC Delivery Acceptance Form as required by the LREC/ZREC program.)

**Note:** REC Meter type assigned based on system configuration and lowest cost during the interconnection process unless otherwise requested. This information will be communicated to the customer. After payment is received by Eversource, the meter will be shipped to customer.
Attachment 3 - Customer Owned Meters
LREC/ZREC/DG - ION 8650\(^1\) greater than or equal to 500kW - Non Revenue Meters

**Metering Guidelines:**

1. The LREC / ZREC / DG customer (herein “customer”) is responsible for all costs associated with purchasing, installing, maintaining, and testing of metering and metering equipment and ongoing communications to the customer owned meter for generation reads on a daily basis.

2. The metering equipment, wiring diagrams (one-line, three-line and site plan), and design must be submitted to and approved by Eversource CT prior to installation.
   a. The meter shall be located at a point where the generator output is AC.
   b. The meter shall be energized at all times regardless of the generator operation. Eversource CT needs to continuously remotely read the meter if the generator is off-line.
   c. The LREC / ZREC / DG meter requires a separate auxiliary power supply, NOT to be fed from the output of the generator.
   d. Site plan to identify location of customer owned meter.

3. Meter Communications Options
   a. Ethernet – IP address, subnet mask and gateway.
   b. Cellular – The customer should understand that the customer assumes all cost and risk of not having cellular service on site if the cellular modem is unable to communicate.

4. All metering equipment shall conform to the latest applicable American National Standard Institute (ANSI) C-12 standards. All metering instrument transformers shall conform to the latest applicable ANSI C57.13 standards

5. Meter Testing Requirements - Compliance with The Eversource CT & UI Guidelines for Generation Interconnection, Fast Track and Study Process, Exhibit B: Generation Interconnect Technical Guidelines and any other program specific requirements in effect.

6. All metering installations require a test switch. Any 480 volt metering installations should be stepped down to 120 volt before the test switch for safety considerations. The ION meter auxiliary power supply should also be 120 volts, not powered from the generator.

7. For each meter installation the following information is required:

| A. | A three line drawing showing the metering connection to the Generator and the Current Transformer (CT’s) polarity markings are facing away from the generator. |
| B. | Data sheet for CT’s showing 0.3% metering accuracy class with burden rating that will not impact metering accuracy. CT’s must operate in the 0.3% accuracy range. |
| C. | Data sheet for PT’s showing are 0.3 % at metering accuracy |

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\(^1\) **ION Meter Contact Information:** Scott DeWeese, Utility Power Supply Co., (401) 447 – 5201
8. Steps required for REC Meter Review and Programming – Approved REC Customer

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>D.</td>
<td>CT / PT ratios</td>
</tr>
<tr>
<td>E.</td>
<td>Generator voltage</td>
</tr>
<tr>
<td>F.</td>
<td>Generator nameplate kW rating (not LZREC contract capacity)</td>
</tr>
<tr>
<td>G.</td>
<td>Meter serial number</td>
</tr>
<tr>
<td>H.</td>
<td>As built verification that the CT polarity markings are facing away from the generating system, and are pointing towards the utility revenue meter.</td>
</tr>
<tr>
<td>I.</td>
<td>IP addresses</td>
</tr>
<tr>
<td>J.</td>
<td>Meter Programming fee of $315</td>
</tr>
</tbody>
</table>

A. Customer/Contractor communicates the intention to install a REC meter to the Interconnection Project Manager (Interconnection PM).

B. Submit the items required in #7 above to the Interconnection PM for review, validations, and programming of the meter.

C. Eversource CT Meter Engineering will provide an email confirming REC meter requirements have been satisfied. (NOTE: This email will satisfy item number 5 on the Certification Statement for REC Delivery Acceptance Form as required by the LREC/ZREC program.)
L/Z REC Meter Validation Form

Date and Time:
Project Name:
Contract #:
Address:
Meter Label Information:
  • Meter Number:
  • Form:
  • Current Class:
  • Voltage:
ID04 Reading (Ex. 00000):
ID10 Reading (Ex. 00001):
ID10 Arrow is pointing to right: Yes or No
(System must be online and generating)

Signature:______________________________Date:_________

Example: