

Public Service Company of New Hampshire d/b/a Eversource Energy
Docket No. DE 22-060

Date Request Received: November 25, 2024
Data Request No. PUC 1-001

Date of Response:
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Request from: New Hampshire Public Utilities Commission

Request:

Provide your company's definition of a customer-generator. The Commission is particularly interested in how this definition affects the categorization of customer- generators by size. In addition, please answer each question below:

- a. Is a customer-generator determined by a physical address?
- b. Is the size of the installation determined by the customer's consumption of electricity or production of electricity?
- c. How would the company treat an entity that owns two net-metered installations on the same plot of land?
- d. How would the company treat an entity that owns two net-metered installations, but each is located on a separate plot of land. Would the distance between the installations or plots affect the definition?
- e. How would the company treat two separate entities that own two net-metered installations on a single plot of land.
- f. How would the company treat a parent company and a subsidiary that each own a separate net-metered installation on a single plot of land.

Response:

Customer-generator is defined by RSA 362-A:1-a, II-b, which states: "Eligible customer-generator" or "customer-generator" means an electric utility customer who owns, operates, or purchases power from an electrical generating facility either powered by renewable energy or which employs a heat led combined heat and power system, with a total peak generating capacity of up to and including one megawatt, except as provided for a municipal host as defined in paragraph II-c, that is located behind a retail meter on the customer's premises, is interconnected and operates in parallel with the electric grid, and is used to offset the customer's own electricity requirements. Incremental generation added to an existing generation facility, that does not itself qualify for net metering, shall qualify if such incremental generation meets the qualifications of

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this paragraph and is metered separately from the nonqualifying facility.” None of the utilities has a company-specific definition of customer-generator.

- a. No, it is determined as described above.
- b. If the question is asking about the designation of “small customer-generator” vs. “large customer-generator” in terms of net metering compensation, that designation is made using the total capacity of the project, consistent with Puc 902.26 that defines small customer-generator to mean “a customer-generator whose facility has a total maximum generating capacity of not more than 100 kilowatts alternating current.”

c. The treatment of multiple installations on a single plot of land is dictated by Puc 903.03:

Puc 903.03 Where Multiple Projects Are Deemed a Single Facility.

(a) Except as otherwise provided in (c) below, projects consisting of electricity generating equipment powered by an eligible renewable energy source or that employ a heat led combined heat and power system, and located behind separate retail meters, shall be deemed to be one facility for purposes of net metering eligibility if the projects are owned by the same person or entity or an affiliate of said person or entity and are located on the same parcel of land or adjacent and contiguous parcels of land, unless each of the following conditions applies:

- (1) Each project is located on a separate parcel of land;
- (2) The property boundaries of each parcel of land have not been subdivided, modified, or otherwise altered within the 10 years immediately preceding the submission of a project interconnection request to the distribution utility;
- (3) Each project is owned by a separate individual or by a separate corporation, limited liability company, or other legal entity; and
- (4) Each project is interconnected with the utility distribution system through a separate interconnection point and with a separate meter.

(b) The restrictions set forth in (a) above shall apply to two or more projects notwithstanding any phased approach to development or different construction schedules for such projects.

(c) Multiple projects located on the same or adjacent and contiguous parcels of land, when such projects are owned by the same person or entity or an affiliate of said person or entity and are interconnected behind separate retail electricity meters, shall be considered separate facilities if each such project is being or has been developed:

- (1) Such that not less than 50 percent of the annual generation output is to serve the on-site load of existing or new retail electric customers;

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(2) To participate in a different electric generation program, such as net metering, direct producer-to-consumer retail sales of electric power, or wholesale sales of electric power;

(3) Using a solar photovoltaic system that is limited in size to that which will fit on the roof and exterior envelope of the building or buildings served by the retail electricity meter through which the system is interconnected to the electric distribution system; or

(4) Using distinct and different electricity generating technologies and equipment that can be operated independently.

(d) As used in this section, “affiliate” means any of the following:

(1) Any person or entity that directly or indirectly owns, controls, or holds with power to vote a majority of the outstanding voting securities or such minority thereof as to give such person substantial control of another person or entity;

(2) Any person or entity that is directly or indirectly owned, controlled, or held by any person or entity described in (1) above through either power to vote a majority of the outstanding voting securities or such a minority so as to maintain substantial control of such person or entity;

(3) Any person or entity with which another person or entity has a management or service contract or arrangement that provides such person or entity with effective control over the management, supervision, or operation of the other person or entity; or

(4) Any person or entity who or which actually exercises effective control over the management, supervision, or operation of another person or entity.

d. Puc 903.03 would have to be applied to determine treatment of the two facilities.

e. Please see the response to part d. above.

f. Please see the response to part d. above.

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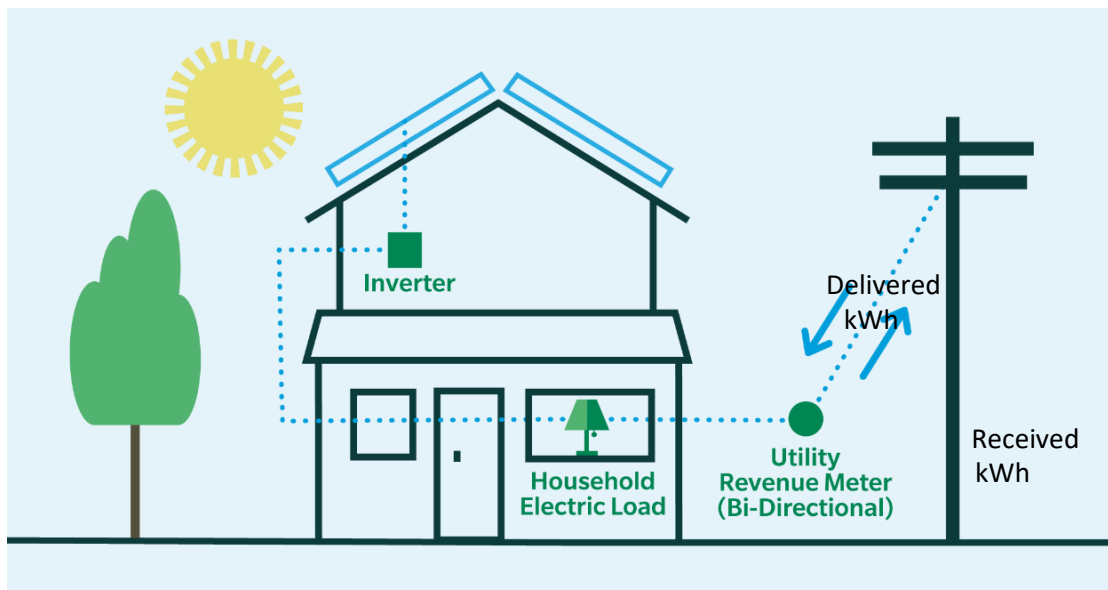
Request:

Please describe the metering hardware that customers on NEM 1.0 use, including brand, model number, and an explanatory schematic diagram. Provide a clear description of how measurement of exports and imports works.

Response:

The Company uses Itron bridge meters as the standard “net or bi-directional” meter for its New Hampshire commercial and industrial customers. The Company also uses a combination of Itron Centron C1SRmeters and Itron Centron Bridge meters for its residential net metering customers. Both meter types record delivered energy (customer consumption) on one register and received energy (customer generation/production exported to the distribution system) on another register. Those registers are read each month, and their values are imported into the Company’s billing system for use in establishing billing determinants required to calculate the customer bill.

The diagram below shows a typical home with a net/bi-directional meter installed. During the course of a billing cycle, as a customer consumes energy from the grid, the register for delivered energy increases. If a customer’s solar panels generate more energy than the customer needs, then the register for received energy on the meter increases. At the end of the billing cycle, both register totals are conveyed to the billing system for calculation of the customer bill and credits, if any.



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Request:

Please describe the metering hardware that customers on NEM 2.0 use, including brand, model number, and an explanatory schematic diagram. Provide a clear description of how measurement of exports and imports work.

Response:

Eversource uses the same meters that it uses for NEM 1.0 customers.

The Company uses Itron bridge meters as the standard “net meter” for its New Hampshire commercial and industrial customers. The Company also uses a combination of Itron bridge meters and Itron Centron meters for residential net metering customers. Both meter types record “delivered” energy on one register and “received” energy on another register. Those registers are read each month, and their values are captured and imported into the Company’s billing system for use in establishing billing determinants required to calculate the customer bill.

The diagram from the response to PUC 1-003 likewise applies here.

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Request from: New Hampshire Public Utilities Commission

Request:

If the Commission were to implement an NEM 3.0 that required sampling in increments of five minutes or less, what brand, including model number, would the company use? Please provide an explanatory schematic diagram.

Response:

If RSA 362-A:9 were amended to include utility metering and billing and a consideration of the interval according to which customers should be net metered, the following considerations would need to be taken into account. What meters to procure is dependent on a number of variables, most of which can only be ascertained at the time of procurement. Procurement of this scale would require a Request for Proposal (RFP) and Eversource would have to see which vendors submit bids. Additionally, since meter technology is continuously evolving, an assessment of the technology at the time of procurement would be required. Utility metering is a costly component to utility service, and meters have a long useful life. Rolling out new meters for the purposes of a change to the net metering tariff may not be in the public interest, as this would result in a drastic increase in the cost of net metering.

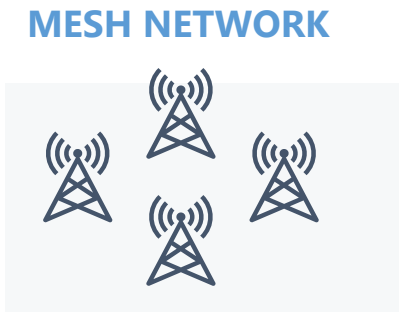
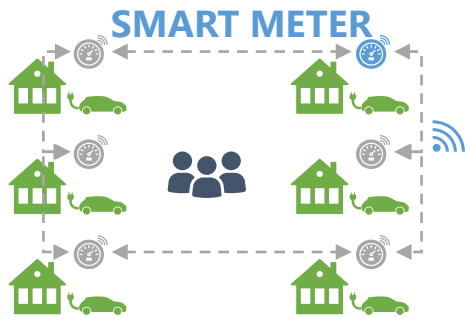
Balancing the duration and cost effectiveness of a so-called sampling interval with the amount of data to be stored and processed is a major consideration. For Eversource, deployment of residential meters that collect interval data which would balance the need for granular data without creating overly cumbersome amounts of data. A five-minute interval would generate a tremendous amount of data and might not necessarily yield a commensurate benefit when compared with a 15-minute interval, depending on what objective is being sought.

Below, for informational purposes, is a diagram of the high-level components involved in an AMI network, which would be necessary to achieve both 15 and 5-minute intervals. In this illustration, the AMI "Smart Meter" sends interval data for both deliveries of energy to the customer (imports from the distribution system, for their consumption) and receipt of energy from the customer (exports of energy produced but not utilized by the customer) through a "Mesh Network" that will communicate to the MDM system and billing system which would be located at Eversource.

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Request from: New Hampshire Public Utilities Commission

Request:

For NEM 2.0 how is the data processed? Discuss how the utilities read the information from the meter and at what frequency (monthly?), and how does this information make its way onto a customer's bill. Show an example of the meter reading for a residential solar customer and a monthly customer bill.

Response:

The Company provides this illustration of the type of meter data collected and processed through the Company's Meter Data Management System (MDMS) and billing system, for a residential solar customer, taking service under the "NEM 2.0" provisions of the Company's tariff (i.e., an "alternative" net metering tariff customer).

Each month, on a date associated with the billing cycle and meter reading schedule for each customer, meter readings representing each of the "bi-directional" channels of the customer's meter are collected and uploaded into the customer's account on the Company's billing system. For each channel, the meter reading from the prior billing period is subtracted from the meter reading from the current billing period to derive the total kWh associated with that channel for the current billing period.

The table below shows a sample of information for a residential alternative net metering customer (NEM 2.0) by channel, from both the prior and current billing cycle that is imported into the Company's billing system, and also shows the derivation of the kWh usage for the current billing cycle based on this information. Data for one meter channel represents the "KWH Purchase (Delivered)" (i.e., the kWh delivered from the distribution system and consumed/purchased by the customer) and data for the other meter channel represents "KWH Sales (Received)" (i.e., the portion of energy produced by but not used by the customer, which is exported to the distribution system). For each channel, the meter data from the previous meter read is subtracted from that of the current read to calculate the kWh's purchased by or received from the customer during the current billing cycle. The determination of 'Net KWH' over the billing period involves netting the kWh figures received from each of these channels for that period, by subtracting the kWh received from the kWh delivered.

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View Usage					
Read Details			Meter Details		
Read Date:	09/30/2024	Read Source:		Meter#:	ACTIVE, SMALL COGEN, 06/13/2023
Prev Read Date:	08/29/2024	Special Read Type:	NORMAL READ	Dials:	5
# of Days:	32	Read Status:	BILLED	Fixed Factor:	0.0000
Usage Use:	BILLABLE READ	Billing Use Code:	INDIVIDUAL	Constant:	1
Usage Data <input type="checkbox"/> Unmeasured Usage					
Usage Type	Previous Read	Current Read	Metered Usage	Measured Usage	Billing Usage
Kilowatt Hours (KWH)				1062.0	1062.0
KWH Purchase (Delivered)	16951	18111	1160	1160.0	1160.0
KWH Sales (Received)	2569	2667	98	98.0	98.0
Net KWH				1062.0	1062.0

The graphics below depict how this information within the Company’s billing system is used to calculate the monthly charges and bill for service to this residential solar customer. The first table shown below (referred to as the “meter box”) provides the monthly meter reading and usage information discussed above, as it appears on this customer’s billing statement (i.e., for each channel, the customer meter number, meter readings, kWh usage data and classification, i.e., purchase or sales). Also included is a footnote that shows the calculation of the net kWh usage, where purchases (delivered) minus sales (received) total the Net kWh usage.

Svc Addr: [REDACTED]				
Serv Ref: [REDACTED]			Bill Cycle: 20	
Service from 08/29/24 - 09/30/24			32 Days	
Next read date on or about: Oct 29, 2024				
Meter Number	Current Read	Previous Read	Current Usage	Reading Type
S03723775	18111	16951	1160	Purchases
S03723775	2667	2569	98	Sales

Purchases of 1160 kWh - Sales of 98 kWh = 1062 Net kWh Usage

This usage information is utilized by the billing systems to calculate monthly charges and credits for service provided to this customer according to each customer’s rate class, consistent with the Company’s tariff. Details of these calculations and charges as they appear on this customer’s bill are provided below. In this example, the kWh purchases and kWh sales are applied in accordance with the alternative net metering provisions of the Company’s tariff: calculation of non-bypassable charges (e.g., SBC and SCRC) is based on total monthly kWh purchases, while calculation of other volumetric charges is based on the monthly net kWh usage (e.g., for distribution, transmission, RRA and supply). Here, kWh purchases exceed kWh sales, resulting in net charges to the

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customer. A net credit for these billing line items would apply if kWh sales exceeded kWh purchases.

Total Charges for Electricity

Supplier

Eversource

Service Reference:

Energy Chrg - Rate R 1062.00kWh X \$0.10403 \$110.48

Subtotal Supplier Services \$110.48

Delivery

(RATE R RESIDENTIAL SVC)

Service Reference:

Customer Charge \$15.00

Distribution Charge 1062.00kWh X \$0.06285 \$66.75

Regulatory Reconciliation Adj 1062.00kWh X \$-0.00043 -\$0.46

Transmission Charge 1062.00kWh X \$0.02965 \$31.49

Pole Plant Adjustment 1062.00kWh X \$0.00270 \$2.87

Strnded Cst Recovery Chrg 1160.00kWh X \$0.01261 \$14.63

System Benefits Charge 1160.00kWh X \$0.00905 \$10.50

Subtotal Delivery Services \$140.78

Total Cost of Electricity \$251.26

Total Current Charges \$251.26

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Request from: New Hampshire Public Utilities Commission

Request:

Please confirm both residential and commercial bi-directional meters capture a net-metered customer's total consumption of electricity, in its entirety. If not, how is the residual consumption treated based on the company's tariff.

Response:

The Eversource bi-directional meters for both residential and commercial applications only capture the portion of customer electricity consumption that originates from the distribution system. These meters do not capture the portion of the customer's consumption of electricity that is self-supplied from on-site, behind-the-meter generation. Any customer consumption is metered and billed consistent with the customer's rate class in the Company tariff. Customer-generators pay non-bypassable charges for total metered consumption, while they only pay for the remaining volumetric charges for net consumption, as discussed in the response to PUC 1-006.

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Request from: New Hampshire Public Utilities Commission

Request:

What changes are necessary for the metering infrastructure to accommodate net-metering customers' ability to leverage electricity storage and more instantaneous netting, ideally five-minute intervals or faster, to allow such customers to extract benefits from away and production towards peak demand periods?

Response:

If RSA 362-A:9 and the PUC 900 rules allowed for the consideration of intervals of five minutes or less, there would still be information requirements and numerous logistical and policy considerations that must be addressed before such an assessment can be made. The question asks about changes to metering infrastructure, but not all necessary information is given and there are numerous required parameters that are undefined. Moreover, a response would require the respondent to rely upon hypotheticals and assumptions that must be based on policy positions, but those policy positions have yet to be determined and so must first be addressed before Eversource could assess what metering infrastructure would then be needed.

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Request from: New Hampshire Public Utilities Commission

Request:

Please confirm whether the currently used bi-directional meters can accommodate a more instantaneous netting than the monthly netting for small customer generators? If yes, please explain to what extent.

Response:

Eversource notes, since the term “instantaneous netting” is not a defined term, the Company is responding to this question on the assumption that instantaneous netting means netting meter channels over an interval of short duration.

It is important to note that, notwithstanding the extent to which Eversource’s meters could capture meter data for periods of less than a month, the meter and meter data are not the only necessary elements of the systems and processes required to execute netting at a more frequent interval. The meter data management system needs to be able to process an exponentially larger quantity of data, and the billing system needs to be capable of working with this extensive data set. Neither Eversource’s meter data collection system nor its two existing billing systems can accommodate a more frequent interval than monthly netting.

The currently used bi-directional meters can accommodate both register reads used for monthly billing as well as the recording interval data for a designated period (e.g., 30 minutes, 15 minutes, etc.) on delivered and received channels. Eversource currently utilizes the register reads for monthly billing as opposed to billing on interval data because the current residential billing systems and data management system in New Hampshire do not support interval billing. All interval billed customers are billed through the Company’s Large Power Billing system that is designed for a small segment of large commercial and industrial customers. However, even these interval metered customers are processed and billed on a monthly basis. The Large Power Billing system is over 40 years old and can neither expand to include residential net metering customers or be modified from the current monthly netting protocol to a more frequent interval.

To support billing net metering customers on more frequent interval data in New Hampshire, a new billing system and meter data management (MDM) system would need to be purchased and implemented. Eversource would integrate the deployment of a new billing system and MDMS with the deployment of AMI to ensure the full functionality of both AMI and the corresponding systems

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is harnessed, as opposed to deploying an investment the size and scope of new billing and MDM systems for the limited purpose of enabling interval-level billing for net metered customers using current metering technology.

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Request from: New Hampshire Public Utilities Commission

Request:

With respect to net-metering, are the utilities aware of any state jurisdiction where the netting of consumption and production of electricity is more instantaneous than the monthly-netting that is currently in place in New Hampshire? If so, please provide that information.

Response:

As mentioned in the previous question, the definition of “instantaneous netting” is not clear, but the Company is generally aware that there are jurisdictions in which consumption and production are netted over shorter intervals than monthly for application in particular tariffs. However, the Company is unable to provide any analysis of those processes or any greater detail on those approaches or the tariffs to which they apply. For Eversource’s eastern Massachusetts net metering programs, Eversource deploys meters that functionally perform netting cumulatively throughout the month but provides only a single register data element that represents the net import or net export for the entire month.

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**Date Request Received: November 25, 2024
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Request from: New Hampshire Public Utilities Commission

Request:

Show a high-level system diagram for residential solar with the bi-directional meter that includes the rooftop solar, and the house consumption. Show where the bi-directional meter is located on the system diagram and confirm that all solar energy generated by the solar array is captured and that all energy consumption from the house is captured.

Response:

The net meter described in the question is located between the customer and the Eversource grid. The rooftop solar and house consumption are electrically connected behind the meter. Therefore, the net meter is not able to see the gross solar generation, the total household consumption, or the amount of solar energy consumed at the customer household. If the meter is recording usage in registers or intervals, it can only measure the net energy delivered to the customer or received from the customer at the electricity delivery point of the distribution grid.

If the customer wants increased visibility into the energy flow from their solar array, they are free to coordinate with the solar developer or other electricians to install their own customer-owned meter downstream of (“behind”) the Eversource net meter. Note also that Puc 903.02(f)(8) provides that: “If, at the time of interconnection, a small customer-generator subject to the alternative net metering tariff requests that the distribution utility install a second utility-owned meter measuring the production of electricity from the facility, the utility shall install such a production meter at no cost to the customer-generator. The small customer-generator shall provide and install a meter socket in a physical location acceptable to the utility.”

Please see the following page for the diagram requested.

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