

Bi-Directional Metering System

Bi-directional metering is available to Firelands Electric Cooperative member-consumers who install and operate a distributed resource (e.g. renewable fuel generators such as biomass, hydro, solar, wind sources, generators, and energy storage technologies) in conjunction with the cooperative's distribution system. A basic explanation of how bi-directional "net" metering works is provided below. For more in-depth information, including installation requirements, please visit www.firelandsec.com/distribution-generation.

What is Bi-Directional Metering?

The term bi-directional metering refers to a meter's ability to measure the flow of electricity in two directions. It measures how much energy comes from the electric utility — kWh delivered. It also measures the difference between the distributed resource's production and the member-consumers load demand — kWh received. Firelands Electric Cooperative's meter does not measure the distributed resource's gross electricity production. As the distributed resource system produces electricity, the kilowatt-hours are first used to meet the member's electricity needs. If more energy is produced from the distributed resource system than the cooperative's member-consumer needs, the additional kilowatt-hours are measured, fed into the utility's electric distribution system, and utilized by other cooperative members.

When the monthly electric bill is calculated, it is determined that if the member-customer uses more electrical energy from the utility than was generated by the distributed resource, the member pays for the net kilowatt-hours (kWh) supplied by utility in addition to any monthly charges and/or fees. If the member-consumer generates more electrical energy than is used, then the member receives a kWh credit, which will be applied to future electric bills. In addition, the member-consumer is required to pay the cooperative's "fixed" monthly distribution charge and any charges and/or minimums applicable under their rate schedule.

Requirements for Bi-Directional Metering

1. An application for distributed resource with copies of design specification sheets attached must be submitted to the cooperative prior to installing a renewable system. Please review the cooperative's interconnection requirements for proper installation guidelines, which are available at www.firelandsec.com/distribution-generation.
2. A distributed resource must meet the specifications of Firelands Electric Cooperative's bi-directional net metering agreements, which specifies the type, capacity, and proposed use.
3. All generation equipment must meet utility, product safety, and grid interconnection specifications listed in the cooperative's technical guideline requirements for interconnection.
4. Approval of the proposed distributed resource application and system inspection by Firelands Electric Cooperative is required prior to interconnection.
5. Following the onsite system inspection, a new bi-directional "net" meter will be installed by Firelands Electric Cooperative. A performance test may be completed to verify that the generator source is isolated from the utility's electrical distribution system in the event the cooperative's circuit is de-energized.

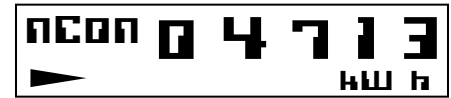


[continued on back]

Bi-Directional Meter Displays

A bi-directional meter measures power flows going into and out of a home or business. The difference between a bi-directional meter and traditional meter is that the bi-directional meter has three different registers: (NCON) delivered, (NGEN) received, and (DG) net; whereas the traditional meter does not.

NET METER CONSUMPTION (NCON) – Power delivered by the utility that flows into the home or business and is consumed/used by the member-consumer.



ENERGY TO MEMBER-CONSUMER

NET METER GENERATION (NGEN) – Received power generated by the renewable system that is coming out of the home or business and going back onto the electric utility distribution system.



ENERGY FROM MEMBER-CONSUMER

DISTRIBUTED GENERATION (DG) – The net difference between NCON minus NGEN, which is calculated on the member-consumer's monthly bill by the utility.



NET ENERGY

Calculating your monthly utility bill using the examples shown:

$$\begin{array}{r} \text{(NCON) "gross" } 04713 \text{ kWh (total power delivered to home/business)} \\ - \text{(NGEN) } 02175 \text{ kWh (total power generated by renewable system)} \\ = \text{(DG) "net use" } 02538 \text{ kWh (total power provided by the utility)} \end{array}$$

These measurements are cumulative. You will need to read the meter on the 22nd of each month and log the measurements, reading the meter again on the 22nd of the next month to compare readings.

Residential & Commercial Power-Flow Indicator

A power-flow indicator shows that power is flowing from the member-consumer to the electric utility company.

The real-time direction of energy flow is displayed by three blinking indicators located in the lower left corner of the meter display. If the indicator bars light up in sequence (and turn off in sequence) from left to right, then energy is flowing from the electric distribution system to the member-consumer.



A right-to-left sequence represents electric energy flowing from the member-consumer to the electric cooperative's distribution system. The speed at which the indicator blinks in sequence is proportional to the amount of energy flowing. The faster the sequence, the more energy is flowing. The power-flow indicator is instantaneous and changes direction and/or speed exactly when the energy flow changes direction.

If you would more information regarding Firelands Electric Cooperative's bi-directional metering and distributed resource interconnection billing, calling 1-800-533-8658 or email members@firelandsec.com.