

EMPIRE ELECTRIC ASSOCIATION

Echoes of the Empire

OCTOBER 2022

MAILING ADDRESS

P.O. Box K
Cortez, CO 81321-0676

STREET ADDRESS

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Cortez, CO 81321

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web eea.coop

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Come test drive an electric vehicle and see for yourself how fun they are!

- **October 12 2-5pm**
- **October 19 10am-2pm**
Member Appreciation Day
- **October 26 8am-Noon**

**Ride & Drive will be at:
Empire Electric
801 N Broadway, Cortez**

First come first served!

SOLAR GENERATION CONTINUES TO GROW

BY ANDY CARTER MEMBER ENGAGEMENT MANAGER



ANDY CARTER


Empire Electric Association was formed more than 80 years ago to meet our community's need for power. Our mission statement still reflects that idea of service, and even though the power industry has changed tremendously over time, EEA's focus remains on our consumer-members. One of the trends in the power industry that we see our consumer-members taking advantage of is the ability to generate their own power. The EEA grid was built to send electricity from a central source to individual homes, not to collect it from those individual homes and send it elsewhere.

The existing EEA grid has some flexibility to allow distributed generation, but when that built-in flexibility is used up, we must carefully evaluate adding additional generation to ensure that power reliability and quality can be maintained for all our consumer-members. As the nature of our grid changes from the traditional one-way power flow to a two-way grid, EEA uses computer modeling to make sure that the electricity delivered to all EEA consumer-members meets their needs. If EEA must make grid upgrades to be able to interconnect a new load or generator, we must balance the costs these upgrades bring with them among consumer-members in a fair way.

Here's a closer look at what is happening as we move toward the grid of the future.

The first net metered solar generator



 2.8 kW net metered Battle Rock Charter School solar array built in partnership with EEA in 2006. The array is still in production, helping to reduce the school's monthly power bill.

connected to the EEA Distribution system was the 2.8-kilowatt array installed by a partnership between Battle Rock Charter School and EEA in 2006. The array is still in service today, helping to provide power to the school located in McElmo Canyon.

From that humble beginning, EEA has continued to support members who want to generate their own power. As of August 2022, EEA has interconnected a total of 432 net metered generators with a total capacity of 5.13 megawatts capable of producing over 9,000 megawatt-hours of electricity a year. EEA currently has over 50 net metered applications approved for construction, and each week we receive more.

In addition to net metered solar generation, EEA has agreed to purchase the power production from three utility scale projects located within our service area. EEA is a member-owned distribution cooperative, and our mission is to safely, responsibly, and reliably meet the electrical energy needs of our members. EEA doesn't generate power for our members — we rely on our wholesale power supplier, Tri-State Generation and Transmission Association, to deliver power to our distribution system. EEA's long-term power purchase agreement with Tri-State affords us the ability to supply up to 5% of our power needs through renewable generation located in our service area.

The three utility-scale solar generation projects EEA will purchase power from are the Totten Lake Solar (2.2 MW); Montezuma Solar (5 MW); and Rocky Ford Solar (2MW). These projects are owned by OneEnergy Renewables, which will construct, operate and maintain them. Construction has begun and EEA is hopeful

YOUR CO-OP NEWS

all three will be completed by mid-2023. The generation from these projects will be purchased through negotiated agreements that reduce EEA's purchased power costs and will help keep your rates low.

There are three other renewable power generators EEA receives power from. EEA's Solar Assist community solar garden began operation in June 2010. The 48 panel 10 kW Solar Assist array provided members the opportunity to lease individual solar panels in the array and receive the credit for the panel's energy production each month on their bill. EEA obtained leases for 21 panels. The annual production from 3 panels are awarded as door prizes at our annual meeting in June.

The remaining 24 panels were combined with a second array in an EEA partnership with Grid Alternatives Colorado to offer solar panel production to low-income qualified members. The 21 kW EEA/Grid Alternatives array began production in July 2016 and serves six members. The third renewable generator is a 240 kW hydro-electric generator owned and operated by the City of Cortez that began production in September 2010.

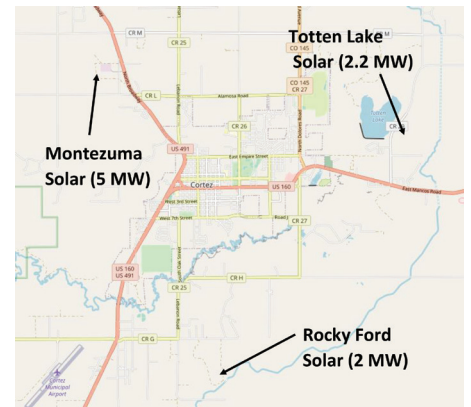
The growth of renewable generation on our system has required EEA to closely monitor the size and location of generators to ensure we can maintain safe and reliable power delivery. The EEA grid was originally designed to take power from Tri-State substations and deliver it to homes. The power only flowed one direction, and conductors and transformers were sized to make sure EEA delivered power within the allowable voltage band required by Rural Utility Standards. EEA System Operators use voltage as an indication of how well the grid is able to supply the power our members need. Because of resistance to current flow based on the material the conductor is made of, voltage will drop as the distance from the voltage source increases. In other words, the farther a meter is from the substation, the lower the voltage will be at the meter.

Distributed generation can help in these types of situations by providing voltage support all along the circuit, keeping voltage levels higher farther from the substation. Another advantage of distributed generation is that it reduces the capacity required on the transmission and distribution system because power is provided locally instead of being generated and then transported long distances. This advantage is limited for solar and wind energy because their production is influenced by environmental conditions. This limitation can be reduced by combining the two types of generation because their peak production occurs at different times of the day as well as seasonally.

Too much distributed generation located close to each other can also raise voltage levels above the maximum allowed. In this situation, the generator is designed to lower its output or cease generating until grid voltage drops back down to an acceptable range.

Along with the impact on voltage, EEA evaluates how a proposed generator may influence current flow. Most grid protective devices are designed to monitor current flow in one direction and are installed to sense flow from the substation out to the end of each circuit. Distributed generation concentrated in one area may cause current to flow back toward the substation during low load conditions. If this happens, a protective device that cannot sense current flowing toward the substation will not operate if a fault occurs. This can create a dangerous situation.

A final consideration for allowing distributed generation to interconnect is the type of generation. You may have noticed that we discuss grid components in terms of volt-amps, like a 10 kVA transformer that has the capacity to deliver 10,000 volt amps of apparent power. When we discuss your appliances that use power, we typically use watts. For example, an all-electric clothes dryer typically uses 5,000 watts or 5 kW of real power. What we don't discuss very much is the third power component



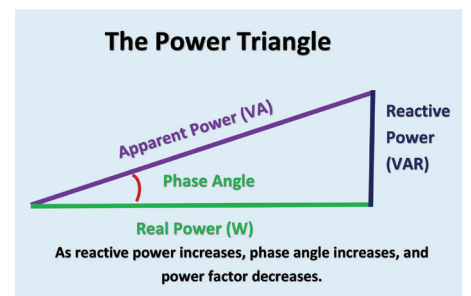
Locations of the three utility scale solar generators EEA will purchase production from.



Construction on the Totten Lake solar array began in August 2020.



10 kW EEA Solar Assist community solar garden located west of EEA Headquarters.



the EEA grid provides: reactive power measured in volt amperes reactive, or VARs. Reactive power is needed by inductive loads or loads that use magnetic fields to perform work. Transformers and electric motors are examples of inductive loads.

Power factor on an alternating current grid is used to describe the ratio of the real power measured in watts to the apparent power required to be supplied by the grid. A

power factor of 1 indicates that all the load is resistive or heat producing, like a toaster or an incandescent lightbulb, and kVA is equal to kW. For an inductive load, kVA is greater than kW and results in a power factor of less than 1 because some of the apparent power is consumed as reactive power.

We are concerned with the type of generation when evaluating interconnections because the generator type has an influence on the amount of reactive power needed to make the EEA grid function. All generators can supply real power, or watts, but not all generators can supply reactive power, or VARs. Synchronous and inverter generators can supply reactive power as well as absorb reactive power as the grid needs, but inductive generators require reactive power from the grid.

EEA is not only concerned with the power factor of the interconnecting generator, but we also need to monitor the influence generators have on the power factor at EEA substations. Tri-State supplies EEA's power and they must supply EEA apparent power to meet our real and reactive power needs. A low power factor requires

larger apparent power to meet the real power required. Larger apparent power requirements require larger facilities and that means higher cost. Tri-State requires EEA to pay for the larger facilities required if a low-power factor condition occurs at a substation. EEA does the same thing in our Large Power and Transmission Tariffs. The additional cost is charged by adjusting the measured demand up to the equivalent of a minimum of 95%.

The default power factor setting for inverters used to convert the direct current produced by solar power to alternating current used on the EEA grid is 1. From the discussion above, a power factor of 1 equates to apparent power equaling real power and zero reactive power. Another way to say it is that an inverter generator set to a power factor of 1 produces only watts and no VARs. If the inverter generator is providing watts to the grid but no VARs, then the apparent power from Tri-State must supply the same number of VARs but fewer watts, which drives the EEA power factor at substations down. If the power factor drops below the minimum required of 95%, EEA must pay Tri-State extra to

compensate for their supplying VARs.

This situation can be addressed by adjusting settings on inverters to produce watts as well as VARs. It can also be compensated for by adding a device called a capacitor that has the effect of increasing power factor on the grid. EEA's interconnection standards already call for induction generators to provide their own reactive power so that the grid is not required to. With the growth of inverter-based generation EEA is also evaluating inverter setting modifications that will alleviate the need for other forms of power factor correction or the resulting additional costs incurred.

The electric industry is in the midst of a transformation, and we continue to see more members using more electricity to do more things. Distributed generation is an important part of the puzzle, and we will continue to work with members who want to install renewable generation to take advantage of its attributes while at the same time ensuring that we maintain a safe, reliable and affordable distribution system.



Focused on **YOU.**

Electric cooperatives were created to serve their members. Because we're a co-op, we're able to adapt to our community's unique needs. That's the power of co-op membership.

**OCTOBER IS NATIONAL
CO-OP MONTH**



Monthly Calendar

October 12 – EV Ride & Drive event at 801 N. Broadway in Cortez from 2–5 p.m. See ad for details.

October 14 – EEA’s board meeting begins at 8:30 a.m. at its headquarters in Cortez. The agenda is posted 10 days in advance of the meeting at eea.coop. Members may attend in person or remotely. Instructions to attend remotely are included in the agenda.

October 19 – Member Appreciation Day. Stop by between 10 a.m. and 2 p.m. for snacks and giveaways and to see the Tesla Model Y on loan from Tri-State.

October 26 – EV Ride & Drive event at 801 N. Broadway in Cortez from 8 a.m. to noon. See ad for details.



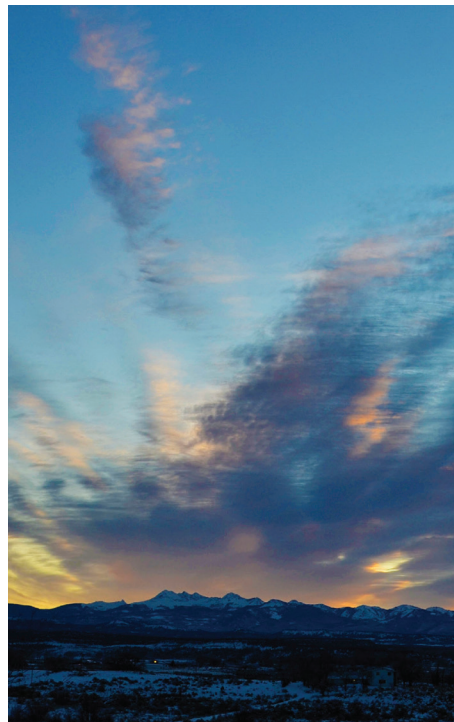
Note to First Responders: Don't Take Chances

It is difficult to wait in an emergency situation, but approaching an energized area puts you and fellow first responders at risk of electrocution. Always wait for the utility to confirm the lines are de-energized.

October 19th is Member Appreciation Day! 10 am to 2 pm 801 N Broadway, Cortez

- Come test drive an electric vehicle and see for yourself how fun they are!
- We will have Giveaways and Food Just for You!

As part of Member Appreciation Month, you can enter weekly prize drawings on our website www.eea.coop, or you can enter by visiting the main office located at 801 N Broadway in Cortez. Prizes will include electric bill credits and EEA promotional items. You must be an active EEA member to qualify, and only one entry per contest per membership.



Co-op Photo Contest Winner October 2022
“Sunrise Over the La Platas & Mesa Verde”
by Chalana Wilson

NOTICE OF A CHANGE IN THE TARIFFS OF EMPIRE ELECTRIC ASSOCIATION, INC.

The Empire Electric Association Board of Directors voted to change EEA’s net metering rate tariff at its August 12, 2022 meeting. The edits primarily address recent changes to the Colorado and Utah regulations concerning net metered installations. The Colorado Public Utilities Commission recently updated its rules regarding interconnection procedures for net metered installations. EEA’s net metering tariff was updated to reference the new rules. Additionally, Utah now exempts small cooperatives that are headquartered out of state from its net metering rules if the cooperative is subject to the net metering rules of the cooperative’s home state. This allows small cooperatives to follow only one set of rules instead of two. Thus, references to Utah rules were removed from EEA’s net metering tariff. Members served under this tariff will not see any changes to their monthly billings.

The new tariff is scheduled to go into effect on November 1, 2022. Written comments about the proposed changes may be submitted electronically through EEA’s website or through hard copies delivered to EEA’s main office. Hard copies may be submitted by mail to P.O. Box K, Cortez, CO, 81321, or hand-delivered to EEA’s main office at 801 N. Broadway, Cortez, CO, 81321. Additionally, verbal comments may be submitted during the member input segment of EEA board meetings.

For any questions about this notice and/or the proposed changes, please contact EEA at (970) 565-4444 or toll free at 1-800-709-3726. Copies of all tariffs are available on EEA’s website at eea.coop/rates. Copies of tariffs are also on file at EEA’s main office and are available for inspection during regular business hours.