Carroll Electric
Cooperative Corporation

Reliable | Affordable | Local

A PRACTICAL GUIDE

for members considering the installation of a net-metering solar facility.

Carroll Electric exists to serve the Cooperative's members with safe, reliable, and affordable electricity. The following information is intended to take a brief look at how installing solar fits into this mission.

Is it safe to install solar panels?

Safety is purposely mentioned first in the Cooperative's mission statement because it deserves top priority. One can reasonably assume a solar array will be installed safely – if a qualified installer performs the work and installs the solar panels appropriately. Choosing a trustworthy installer is very important.

Additionally, members should remain aware of how their solar system is performing once their system is interconnected to the electric grid. Solar system malfunctions such as inverter failures do occur. These malfunctions hold the potential for harm beyond a member's own property by energizing anything which might be in contact with an otherwise de-energized power line.

Because this imposes a paramount concern for safety, the Cooperative presently performs routine inspections at no cost to members who are interconnected to the electric grid. Even though these inspections are routinely performed, the Cooperative does not assume any liability should any of these systems malfunction. Liability insurance should be given strong consideration by members who interconnect their systems to the grid.

A claim sometimes made is "*solar energy will keep working when the power goes out*." Unless a home's solar energy system is capable of operating independent of the electric grid, a solar-powered home will still lose power during an outage. When the power goes out, a grid-tied solar system is required to automatically stop feeding power back to the grid. This required safety precaution is intended to protect utility workers who are repairing the lines, as well as the public, from being harmed by electricity flowing back to the grid.

Is solar reliable?

The short answer is, "**It depends**." Dividing this answer over different time periods offers a better understanding of what to expect.

In 2015, Carroll Electric installed a Solar Demonstration Lab. This solar lab consists of a variety of solar installations and has proven to be a valuable tool in educating the Cooperative and its members about solar power.

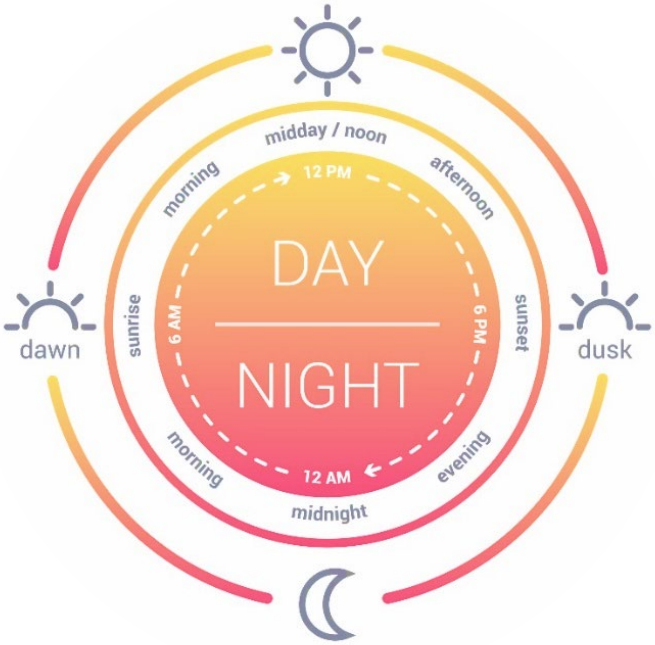
1st Time Period: 24 Hours

It is well understood that a solar array's production will generally have maximum production in the middle of the day and no production at night.

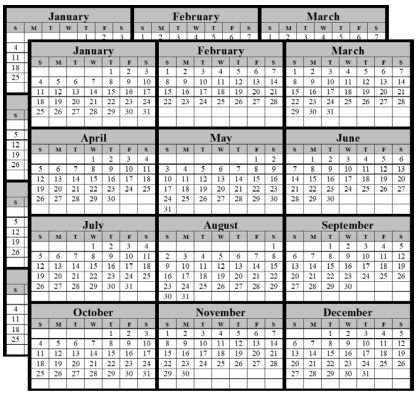
By contrast, the maximum demand experienced by the Cooperative occurs early in the morning (during the winter) and late afternoon (during the summer). For 2022, the maximum peak demand at the Cooperative occurred on Dec. 23 at 8:00 a.m. when the Cooperative's solar lab was producing 1% of its rated capacity.

For example, if your solar installation was rated at 5 kilowatts (kW), on peak this system would have been producing .05 kW (1%). There's also a really good chance your solar system would not be producing enough energy to cover the entire needs of your home during that time.

Until large scale battery storage systems become more advanced, existing power plants, transmission lines, and distribution lines are essential to providing reliable electricity (even to net-metering customers) 24 hours a day.



2nd Time Period: 24 Months



The Cooperative's Solar Demonstration Lab experienced six performance problems (some of which might have gone undetected without close monitoring) in the first 24 months of its existence. Each issue took weeks, and for some, months to resolve. All the while, solar production was being lost. These types of problems and follow-up repairs continue to occur and are not limited to the first 24 months. Monitoring and repairing the system is an ongoing endeavor.

All innovation must have a starting point. Believe it or not, there was a time, early in the Cooperative's existence (1940s) when members would actually report outages on postcards delivered to the Cooperative by the U.S. Postal Service. Technology has come a long way since then.

3RD Time Period: 25 Years

Two points deserve attention here:

1. Availability of a solar array's warranty, as evidenced by the Solar Demonstration Lab, is very important. Many solar arrays have a 25-year warranty, at least on the panels.

   Sadly, two (2) of the five (5) solar panel brands represented in the Solar Demonstration Lab, vacated their warranty in the first two years. One company, Suniva, filed for bankruptcy protection. Another, tenKsolar, ceased operations altogether. A third company, SolarWorld, filed for insolvency and was bought out by SunPower Corporation. Luckily, SunPower decided to honor existing SolarWorld warranties.

2. Solar array production is expected to drop over time. Many solar array warranties allow 3% panel degradation in the first year with an additional 0.7% per year (approximately 20% over 25 years). The Solar Demonstration Lab also supports this expectation, but actually indicates higher degradation rates than the manufacturers' ratings[1] .

The Cooperative's reliability of service is subject to regulatory oversight from a number of government agencies including the Arkansas Public Service Commission and USDA's Rural Utilities Service.

The reliability of solar arrays, however, has no regulatory oversight. The Cooperative encourages members to do their own research on the expected lifetime production, warranty terms, and the financial solvency of the companies offering warranties on their solar panels. Searching the internet for "solar bankruptcies" and the brand of the solar array(s) you are considering would be a simple place to start.

Is solar affordable?

Similar to a conventional power plant, solar arrays are not cheap on the front end. Making reasonable assumptions about a solar installation and how it will perform in the future can help determine when or if you will get your money back and begin to see savings. These assumptions are important whether you are borrowing the money, leasing, or investing your savings.

The ECONOMIC ANALYSIS for installing solar is complicated. However, there a few things you should be aware of.

- Installing solar does not eliminate your monthly electric bill. While you can possibly reduce your overall electric bill with solar, there are some charges on your bill that are fixed each month that simply cannot be avoided.

- Many solar quotes apply a 4% to 6% annual increase to your current energy rate when preparing a solar proposal. This practice drastically increases estimated savings over time and creates a false sense of urgency to "sign on the dotted line." Over the last 30 years, Carroll Electric's residential rates have increased by 1.33% each year and are presently 17% below the national average.

[1] Over the years, the Solar Demonstration Lab has seen over a 3% drop in production which does not appear to be explained by weather conditions or down time from performance issues.

- A tax credit is an allowance issued by the federal government. If you meet eligibility guidelines, the qualified amount can be subtracted from the amount of taxes you owe in a given year. A tax "credit" does NOT result in a cash-in-hand refund, rather it simply reduces the amount of taxes, if any, that you owe.

- There are free online resources that allow customers to verify whether a future solar production schedule is accurate.

  PVWatts Calculator: https://pvwatts.nrel.gov/pvwatts.php

The Cooperative also recommends you answer the following questions to assure the assumptions used today support your decision into the future:

Questions to Ask

1. **What is the assumed value of savings per kWh in the ECONOMIC ANALYSIS? (SEE NEXT PAGE)**

   NOTE: The Cooperative can provide account-specific information upon request.

   ⚠ ***CAUTION**: The Cooperative has seen vendor proposals to our members **which do not use the correct amount of savings for each kilowatt-hour (kWh)**. Electric rates can be very complicated and vary significantly between various utilities and classes of customers.*

   ⚠ ***CAUTION**: Vendor proposals to potential customers sometimes not only distort the initial savings, but then inflate the distortion by as much as 4%-10% per year. **Simply stated, this type of trend is historically inaccurate**. Based on the Cooperative's actual electric rate data since the 1990s, the historically accurate inflation rate is around 1.33% per year. Using reasonable assumptions is CRITICAL in forecasting future utility savings.*

2. **Will my income tax liability allow me to realize the full potential value of the investment tax credit?**
3. **Are there any interest charges, liens, or other long-term obligations included in the proposal?**
4. **Should I purchase property insurance to protect my investment from risks like tornados, hail, lightning, etc.?**
5. **Should I purchase liability insurance in case a malfunction of the equipment harms someone's life, welfare, or property?**

   Net metering customers are liable for any claims that their system has harmed the life, welfare, or property of others. Our field testing reveals net metering systems do not always automatically disconnect from the electric grid during a power outage as they are supposed to.
6. **How can I be assured product warranties will survive a product manufacturer filing for bankruptcy or dissolution?**
7. **Does the product warranty include the cost of labor for repairs?**
8. **Is the expected decline in kWh production described in the product warranty?**
9. **What will be my future responsibility for removing and/or disposing of the system?**
10. **How might ongoing regulatory changes impact how net metering is compensated?**

***** The above questions cannot be answered by the Cooperative. Members must assume responsibility for how these factors/risks impact the future. *****

The value of the electricity your solar panels produce varies by utility and by class of service. The below table is updated annually to reflect the average savings per kilowatt-hour (kWh) members of the Cooperative received for their solar panel production.

	Residential Customers	Commercial Customers[2]
Savings per kWh[3]	**2018 = 8.70 cents** **2019 = 8.55 cents** **2020 = 8.42 cents** **2021 = 9.90 cents** **2022 = 10.87 cents**	**4.79 to 5.44 cents** depending on class of service (contact the Cooperative)
Savings per kW of Peak Demand	This rate class is not demand metered. No savings per kilowatt (kW) of demand should be expected.	Demand savings, if any, can be very uncertain. Extreme caution should be exercised in estimating demand savings.

Recommended?

As of the end of 2022, 1.38% of Carroll Electric members have invested in solar generation. Of those members, some have been satisfied. Others have not.

Whether or not something is a good investment is a subjective decision only you can make. The Cooperative's goal is to help its members make an informed decision about their potential investment in a solar net metering facility.

Our experiences with the Solar Demonstration Lab and the solar industry in general helps provide the data our members need to make an informed decision. If you would like to discuss this further, you are welcome to contact our Member Services Department at 800-432-9720.

[2] Large scale systems may require significant integration costs borne by the COMMERCIAL member. These cannot be accurately calculated by a solar vendor. Commercial members are advised to contact the Cooperative early in the process of evaluating a large-scale system. In addition, approval by the Public Service Commission is required if system sizes exceed statutory limits.

[3] While the savings per kWh is based on the Cooperative's specific data (excluding taxes), **members should be aware that laws and regulations governing the savings for net metering is still evolving**. Specific tax rates will vary based on location and possible exemptions should be reviewed by members to ensure accuracy.