



**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.



safe

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 that 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 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 that "*solar energy will keep working when the power goes out.*" Unless a home's solar energy system is capable of operating independently 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.

reliable

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.

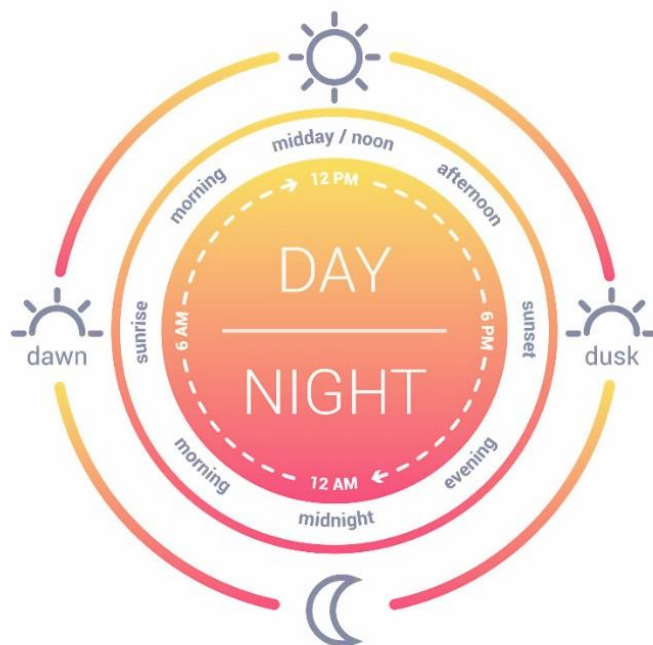
1st Time Period: 24 Hours

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

January	February	March
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
April	May	June
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
July	August	September
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
October	November	December
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

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. The 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.

affordable

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 are 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." Although inflation has led to increasing costs in many areas, the cost of powering your home rises much slower when compared to the rising costs of other common goods.

¹ Over the years, the Cooperative's 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 that you answer the following questions to ensure 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?	<p>NOTE: The Cost Shift Prevention Act of 2023 requires Arkansas utilities to compensate the energy fed back to the electric grid from a net-metering facility installed after September 30, 2024, at the utility’s avoided cost, which is between 2 and 3 cents per kilowatt-hour.</p> <p> CAUTION: The Cooperative has seen vendor proposals to its members <u>that do not use the correct amount of savings for each kilowatt-hour (kWh)</u>. Electric rates can be very complicated and vary significantly between various utilities and classes of customers.</p> <p> 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. <u>Simply stated, this type of trend is historically inaccurate.</u> Using reasonable assumptions is CRITICAL in forecasting future utility savings.</p>
2. Will my income tax liability allow me to realize the full potential value of the investment tax credit?	
3. Are 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?	<p><i>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.</i></p>
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. ***

The value of the electricity your solar panels produce varies by utility and by class of electric service. For specific utility or account information, please call the Cooperative's Member Services department at **1-800-432-9720**.

Recommended?

Less than 2% 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 help provide the data our members need to make an informed decision.

If you would like to discuss the net-metering process further, you are welcome to contact our Member Services Department at 800-432-9720.



Teddy Willing
Member Services Coordinator

Carroll Electric
Cooperative Corporation
PO Box 4000
Berryville, AR 72616

PO Box 4000, Berryville AR 72616
870-432-9720 Ext. 1420
twilling@carrollecc.com



Eric Jones
Member Services Specialist

Carroll Electric
Cooperative Corporation
PO Box 4000
Berryville, AR 72616

PO Box 4000, Berryville AR 72616
870-432-9720 Ext. 1421
ejones@carrollecc.com



Trevor Gibbins
Member Services Specialist

Carroll Electric
Cooperative Corporation
PO Box 4000
Berryville, AR 72616

PO Box 4000, Berryville AR 72616
870-432-9720 Ext. 1422
tgibbins@carrollecc.com