

Do solar panels work on a cloudy day?

Solar panels require sunlight to generate electricity for your home so they do not work in darkness. Thus they will not produce at night but what about on a cloudy day? The purpose of a solar panel system is to absorb sunlight, also known as photovoltaic (PV) energy, and convert it to direct current (DC) power. This DC power is then sent through the solar array's inverter to be converted to alternating current (AC) power, which is the type of power households run on. At that point, your solar array can feed electricity into your home and out onto the electric grid.

If the homeowner has a solar array equipped with a battery system, they may use power directly from their solar array. Otherwise, all energy is sent to the grid and measured by a bidirectional meter. This allows the power utility to credit the customer's account, reducing their energy bill.

Figure 1 is a recording of the energy production of a solar array in Nebraska on Feb 17 of this year; a sunny day. As you can see, as the first rays of morning sun hit the array, the system starts to produce electricity. Figure 2, below, was taken on a cloudy day this year; Jan 22.

The simple answer is that solar panels do work in cloudy weather – they just do not perform as well as they would on a bright sunny day. Although estimates differ, solar panels will generate about 10 – 25% of their normal power output on a cloudy day. However, in some cases, clouds can actually result in better panel performance than standard sunny weather. Clouds can reflect or even magnify sunlight, which results in additional power output from your solar panels if the sun shines. But, what if it doesn't?

On August 21st, 2017, many Nebraskans and Americans across the country experienced a total solar eclipse. This rare moment in time, when the moon completely blocks all the rays and energy of the sun, is a spectacle to behold. On that day, the same system that recorded the first two production charts in Figures 1 and 2, recorded this event as well. From noon to a little after 1 PM, the total eclipse diminished and eventually halted all production on the system (Figure 3).

As you may have suspected from the slightly jagged edges in Figure 3, there was some light cloud cover that day, but still not enough to read a significant difference in production as the moon passed in front of the sun. From the chart in Figure 3 we can see that the clouds started to increase that afternoon, yet production continued. In conclusion, a solar array will produce great on a sunny day, and will effectively produce energy on cloudy days, saving you money year-round. And if you are worried about losing production during another eclipse, the next one is scheduled to put a total stop on solar energy production in North Dakota and Minnesota in 2099.

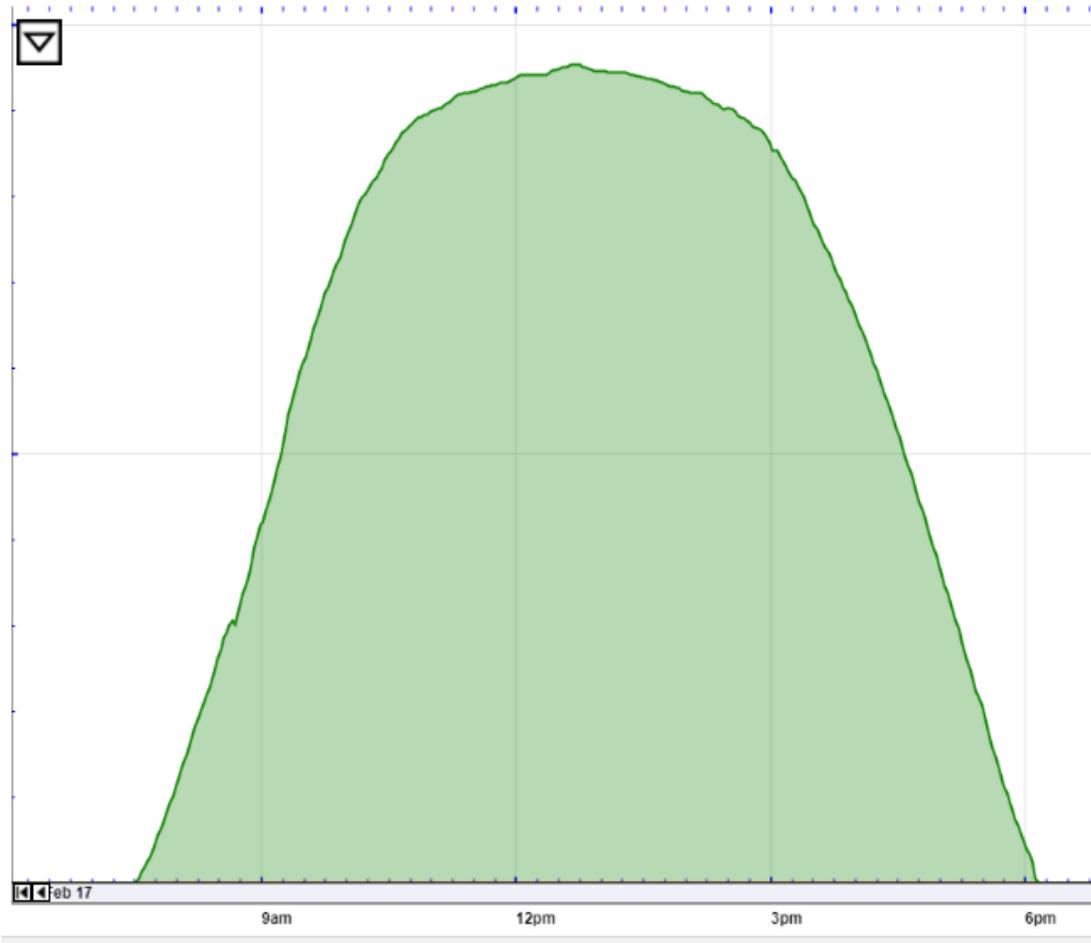


FIGURE 1

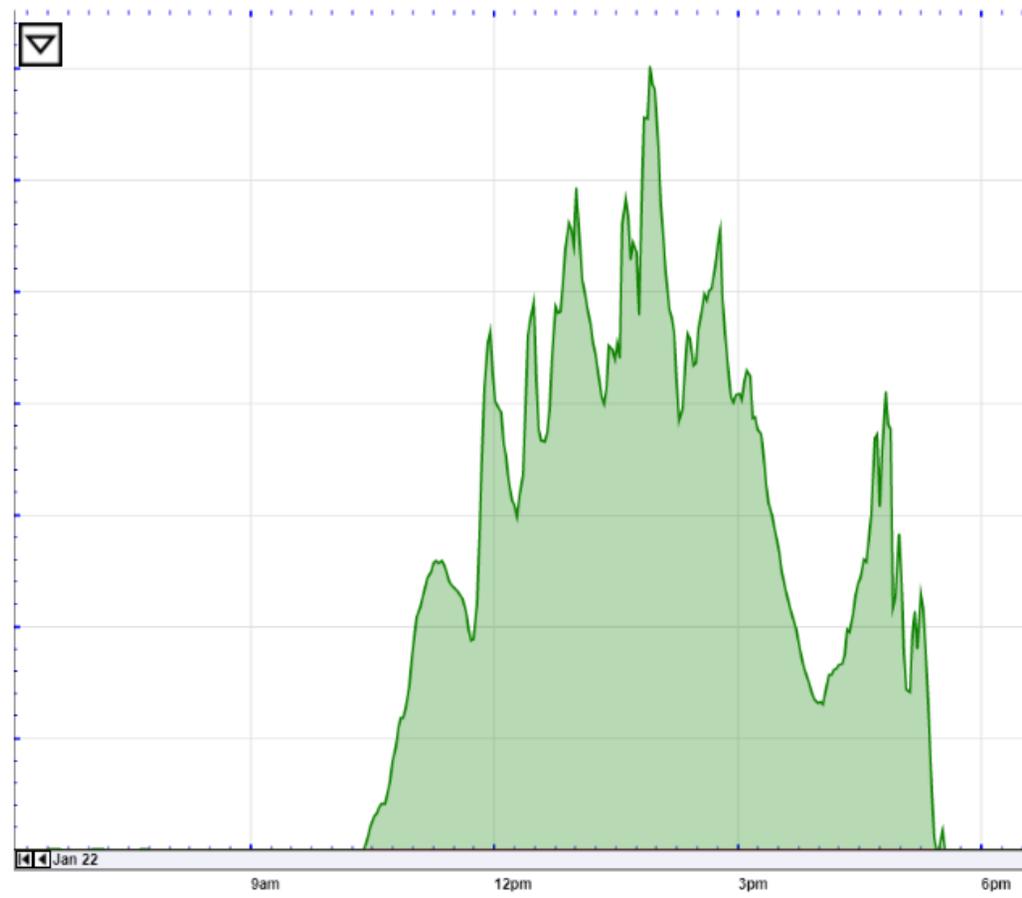


FIGURE 2

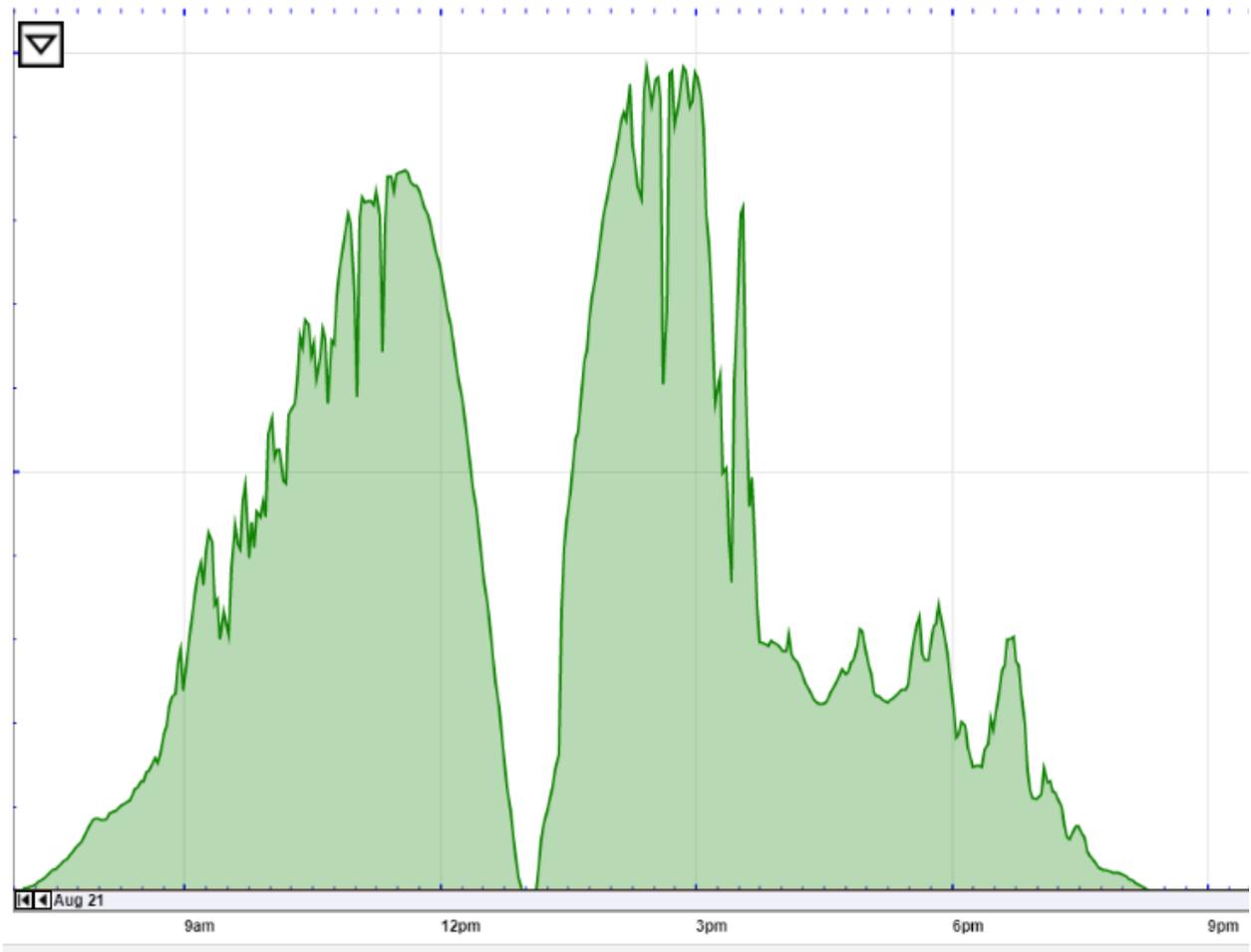


FIGURE 3