



What is Net Metering for Solar?

By Robert Turner



What is net metering? Learn how the battle over solar-power reimbursement is shaping the future of energy independence in each state due to state law and utility regulations.

Home solar power has experienced exponential growth over the past 15 years, thanks to homeowners who have taken advantage of falling hardware and installation costs, coupled with government incentives. As far as trends go in the energy sector, it's difficult to overstate photovoltaic solar's powerhouse growth. To fully appreciate this point, it's useful to talk some numbers.

In 2010, solar panels cost an average \$8.70 per watt and were about 15 percent efficient. Because the U.S. Energy Information Administration estimates the average American household uses 10,700 kilowatt-hours of electricity per year, a homeowner in 2010 would've paid more than \$60,000 to purchase a system sized to completely cover their electricity needs. Today, solar panels cost about \$3 per watt and are between 19 and 22 percent efficient – meaning you could go solar now for roughly one-third the cost (plus access a bevy of government rebates and tax incentives to lower costs further).

The new economics for going solar has compelled 4 million homeowners across the U.S. to invest in a solar system. For many, their choice is buoyed by a wonky but critical energy rule known as “net metering.”

What is Net Metering?

Net metering allows for any solar producer connected to the grid – including any homeowner with a few panels on their roof – to be paid for the electricity they send back to the grid. Under the classic version of net metering, homeowners receive monthly credits on their utility bills for each watt of electricity their system produces in excess of what their household used. Solar homes can effectively offset their entire bill and be paid for their net-negative usage.

But in recent years, net metering has sparked a contentious debate between homeowners and power companies. What may at first appear to be a somewhat nerdy policy squabble is actually a make-or-break moment for renewable energy.

The Rise (and Fall?) of Net Metering

Net metering got its start through something of a lucky break back in 1979, when a 28-year-old architect named Steven Strong put solar photovoltaic panels on two building projects: a 270-unit low-income apartment complex and a Department of Energy-funded solar demonstration home called the Carlisle House. The funny thing, says Bob Johnstone, who profiles Strong in his book *Switching to Solar*, is that Strong “had forgotten to inform Boston Edison, the local utility, of his plan to feed excess wattage into its distribution network.” At a high-profile ribbon cutting for the apartment building (for which President Jimmy Carter even accepted an invitation to attend), “power companies were delighted to bask in the positive publicity that flowed from being seen as supportive of renewable energy,” Johnstone wrote.

For the decades that followed, net metering largely enjoyed widespread acceptance by utilities (no doubt because it was hardly used until solar's big leaps in the 2000s). But as millions of solar homes have taken advantage of the rule, electric utilities are pushing to lower the value of the credit they must give to homeowners, if not flat-out eliminate net metering altogether.



It's become commonplace for power companies to quibble year after year about paying retail versus wholesale rates to solar producers. Utilities say maintaining the grid infrastructure requires high, ongoing investments, so reimbursing homeowners at retail rates – which tend to be significantly higher than wholesale rates – results in higher utility bills for non-solar customers. They also claim the intermittency of solar, such as when the sun comes out from behind clouds and hundreds of homes start pumping power into the grid, strains existing infrastructure and necessitates costly upgrades. Power flows into the grid during the middle of the day when solar production is at its peak but residential demand is low because people are at work. Peak demand times tend to be between 6 p.m. and 9 p.m., when people return home and turn on lights and appliances.

Utilities take these arguments to courts and to lawmakers, lobbying against expanding net-metering programs or increasing reimbursement rates, fearing the potential loss of revenue and market share (ominously called the “utility death spiral”). Some utilities have proposed alternative compensation structures, such as fixed monthly credits or adding “grid-connection fees” to solar customers’ bills, ensuring they can continue to receive a monthly bill. They’ve cleverly labeled their practice of paying low wholesale rates as “net billing,” allowing power companies to pay less but keep the good PR surrounding solar payouts.

What Solar Supporters Want

Solar homeowners argue that wholesale rates are inadequate and fail to reflect the true value of solar power. Their advocacy has garnered support from environmental advocates, renewable energy companies, and homeowners associations, which argue that incentivizing solar adoption is essential for combating climate change and transitioning to a sustainable-energy future.

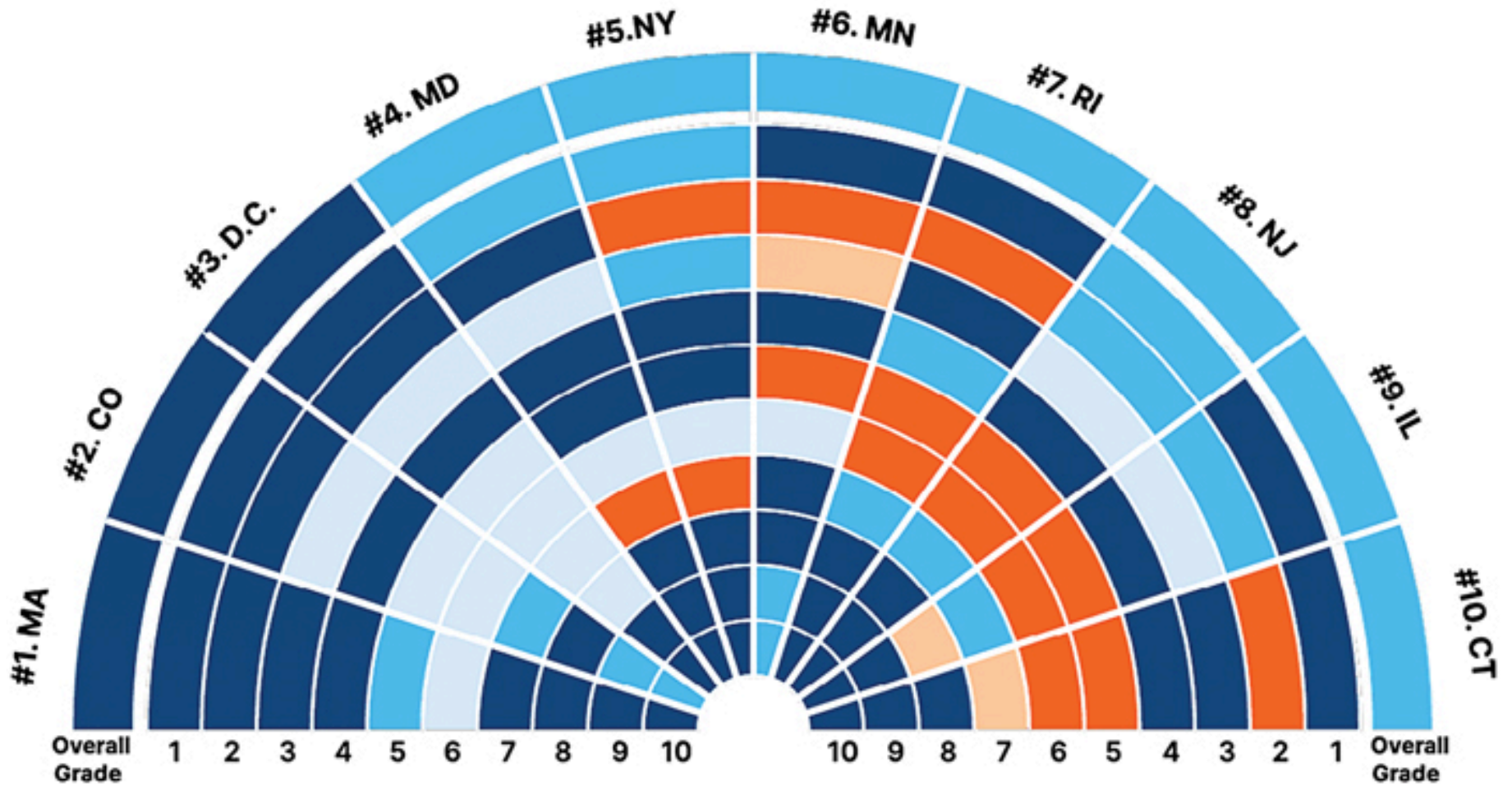
To counter the demand-response conundrum, solar advocates say advancements in grid-management technologies, such as [smart meters](#) and energy-storage systems, enable utilities to better integrate solar onto the grid and balance supply and demand more effectively. Some utilities have implemented demand-response programs and time-of-use pricing schemes to incentivize consumers to shift their energy consumption to periods of low demand.

When rules change about how much is reimbursed (as they seem to keep doing year after year), homeowners call “bait and switch.” They’ve made a large investment for solar power under previous rules, after all. In response to growing pressure, some states have enacted laws mandating fair compensation for solar-energy producers. For example, New York implemented the Value of Distributed Energy Resources (VDER) tariff, which calculates compensation for solar energy based on location and environmental benefits in addition to the wholesale market value.

State by State Net-Metering Laws

Under the U.S. federalist system, state legislators long ago retained significant powers to regulate utilities, and the result is a patchwork of rules across the country. For years, the most favorable net-metering laws tended to be in the Northeastern states, including Connecticut, New York, and New Jersey, but Colorado, Minnesota, and more also have good net-metering track records. Only three states – Alabama, South Dakota, and Tennessee – offer homeowners no form of net metering or other compensation.

2023 Top 10 States for Home Solar



Most states fall somewhere in the middle. In North Carolina, where I farm, net metering is voluntary for utilities, and reimbursement rates aren't regulated by state law. New compensation rates approved in 2023 include a "grid-access fee" and slash electric bill savings by up to 40 percent.

Take a look at the [Solar Energy Industries Association's state-by-state map](#), and you'll notice right away how the absence of supportive policies hinders solar growth: over 5,000 megawatts of installed solar in relatively tiny but net-metering-friendly Massachusetts, compared with a mere 2 megawatts installed in huge and sunny North Dakota!

California Public Utilities Commission Bait and Switch

The California Public Utilities Commission (CPUC) unanimously voted in December 2022 to revise the net-metering policy for the state. The revision went into effect in April 2023 and decreases the value of solar credits by a whopping 75 percent. CPUC's logic is that the change should encourage customers to purchase battery storage with their solar systems, shifting more homes away from California's notoriously strained, wildfire-prone grid.

Opponents claim the solar payback period in California will triple as a result, from 5 to 6 years previously to between 14 to 15 years following the update. They say the change doesn't promote the state's ambitious climate goals but instead discourages the adoption of solar by making it less affordable. The CPUC seems to be walking a fine line, and where the battle ends could influence laws across the country.

Does Solar Still Make Sense?

My opinion is that utilities should fairly compensate homeowners for the solar power we produce. It's one of the quickest ways to incentivize more people to go solar at the speed necessary for achieving the country's climate goals while getting off foreign energy supplies. However, I don't need to wait around for lawmakers, utility CEOs, and trade groups to hash it out. Even for folks who have no access to net metering, net billing, or another schemes, it still makes sense to go solar – you'll just face longer payback periods with potentially lower monthly bills.

Although I don't receive the greatest incentives to power my North Carolina farm with solar, I've learned ways to get the most from my investment. Devise a time-of-use plan for your own home, whereby you use the most energy during the daytime when your system is generating the most electricity. You'll use more of your homegrown power by charging electric vehicles or running your dishwasher during peak daylight hours.





Of course, you can invest in a battery system and use stored solar energy to steer clear of grid electricity as much as possible. It sounds counterintuitive, but spending more on a solar-plus-storage system can actually shorten the time a solar system takes to pay for itself (especially in states that provide good battery incentives). If your system allows you to keep the lights running during a power outage, be sure to factor in fuel costs you'll avoid by not using a diesel generator.

The trade group Solar Energy Industries Association estimates home solar demand will keep on pace despite the confusing patchwork of regulation, reaching 10 million residential systems within the next six years. Whether state lawmakers choose to side with the power companies or with residents will likely make all the difference.

Know Your Solar Incentives

Solar laws vary in every state – and they keep changing. Before you make an investment in rooftop solar power, check with both your local power company and these resources below to get the latest information, as regulations will affect the length of time for the return on your investment.

[EnergySage](#) is a free online marketplace established in 2009 with U.S. Department of Energy funding to help consumers compare quotes and [select installers](#) for solar panels, batteries, [heat pumps](#), EV chargers, and home electrification guides.

DSIRE, or the "[Database of State Incentives for Renewables & Efficiency](#)", is operated by the North Carolina Clean Energy Technology Center at North Carolina State University and receives support from EnergySage and the U.S. Department of Energy.

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