Solar

Department of Energy

Solar energy is the fastest growing and most affordable source of new electricity in America. Over 3 million installations have been built across the country—with 1 million being built in the last two years. As the cost of solar energy systems dropped significantly, more Americans and businesses have taken advantage of **clean energy**.

SOLAR DATA *cheat sheet*

People are currently employed by the solar industry[1]
231,474

126.1 GW
Amount of solar currently installed in the U.S.

Value of the U.S. solar market in 2021
$33.0 billion

Today, over **4%** of U.S. electricity comes from solar energy, more than **80** times its share a decade ago

To help address climate change, the solar industry set a goal to reach...
30% electricity generation by **2030**

Number of solar businesses in the U.S.[3]
10,000+

3,472,279
Number of solar energy systems installed in the U.S.

Solar PV price decline over the past 10 years
50%

Top corporate solar users through 2019

1. Apple - 398.3 MW
2. Amazon - 369.0 MW
3. Walmart - 331.0 MW
4. Target - 284.8 MW
5. Google - 245.3 MW
6. Kaiser Permanente - 181.8 MW
7. Switch - 179.0 MW
8. Prologis - 133.7 MW
9. Facebook - 119.5 MW
10. Solvay - 81.4 MW

Carbon emissions reduced:
141 million
metric tons annually, equivalent to:

- **30 million** vehicles off the road
- **16 billion** gallons of gas not used
- **2 billion** trees planted
- **Shuttering 38 coal-fired plants**

State ranking by cumulative solar capacity

1. California - 35,950 MW
2. Texas - 13,947 MW
3. Florida - 9,012 MW
4. North Carolina - 7,935 MW
5. Arizona - 5,743 MW
6. Nevada - 4,967 MW
7. Georgia - 4,299 MW
8. New Jersey - 3,992 MW
9. Massachusetts - 3,927 MW
10. Virginia - 3,790 MW

33%
average annual growth of the solar market over the past 10 years

300 GW
of new solar capacity will be installed over the next 10 years...
3 times greater
than the amount installed through 2021

In Q1 2022, solar accounted for
50%
of all new generating capacity

There is enough solar energy installed in the U.S. to power
22.0 million households[4]

13%
of U.S. homes will have a solar PV system by 2030

In 2021, a new solar project was installed every
60 seconds

SEIA Solar Energy Industries Association®

Solar Energy Technologies Office

Busted: Common Solar Myths and Misconceptions

SEPTEMBER 15, 2021

When it comes to installing solar panels on your roof, some homeowners may be hesitant to adopt it because of what they've heard or read on the internet. We live in an era of misinformation, which, unless we vigorously check our sources, can prevent us from living our best lives.

But fear not: The U.S. Department of Energy Solar Energy Technologies Office (SETO) is all about the facts. Let's set the record straight so rumors and falsehoods don't prevent you from reaping the benefits of solar energy. Here are some common myths and misconceptions:

Myth #1: Solar only works when the sun is shining. I still need power when it's raining. Actually, solar technology can be leveraged in virtually any condition, including rainy and snowy days, because some sunlight still reaches the earth. Solar panels tend to perform best in cold and sunny climates because heat interferes with the conversion of sunlight into electricity. (Keep in mind that solar panels collect light, not heat.) On top of that, battery storage can be connected to your solar panels and provide energy at night. This is your clean-energy backup, as opposed to conventional backup generators—if the power goes out in your neighborhood, your power will stay on.

But the bottom line is, unless you're among the tiny fraction of Americans who live more than about a mile from a power line, a home with rooftop solar panels is still connected to the electric grid. This means that if your solar energy system doesn't supply enough electricity, the grid will supply the rest.

Myth #2: Solar panels aren't efficient enough. Some customers hear that solar panels have an **efficiency rate** of 22% and wonder why it's not 100%. Some sunlight will be reflected off the panel or be turned into heat instead of electricity. Solar cell materials also can't absorb all the types of light that make up sunlight, like infrared light. The world-record efficiency for a solar cell at room temperature under normal sunlight is 39%, but these cells are too expensive to be cost-effective for home solar panels.

Truth is, the sun produces an enormous amount of energy—the sunlight that shines on the earth in just one and a half hours has more power than the world consumes in an entire year. With this huge energy supply, commercially available solar panels provide plenty of power to meet your home's needs, at a cost at or below electricity provided by the grid in most parts of the country. But solar technology continues to advance and improve every year, thanks in part to research funded by SETO. If you wait for continued advancements, you may risk missing out on today's plethora of solar **incentives and tax credits**, which come with expiration dates.

Myth #3: Solar is too expensive. While the cost of a residential solar system can range from **$15,000 to $35,000**, you don't have to pay for it all at the time of installation. There are several **solar financing options** that allow you to pay over time, plus local, state, and federal tax incentives and rebates to offset the costs. And solar panels require little ongoing maintenance—they are durable and reliable. If you live in a dusty environment, you may want to clean them once a year to maximize power output, but that's about it. As demand for solar energy continues to grow, SETO is working to ensure the costs keep declining.

Homeowner's Guide to Going Solar

Solar Energy Technologies Office

WILL I SAVE MONEY BY GOING SOLAR?

The amount of money you can save with solar depends upon how much electricity you consume, the size of your solar energy system, if you choose to buy or lease your system, and how much power it is able to generate given the direction your roof faces and how much sunlight hits it. Your savings also depend on the electricity rates set by your utility and how much the utility will compensate you for the excess solar energy you send back to the grid. Check the National Utility Rate Database to see current electricity rates in your area.

In some cities around the country, solar is already cost competitive with the electricity sold by your local utility. The cost of going solar has dropped every year since 2009, a trend researchers expect to continue. Not only are the prices of panels dropping, so are the costs associated with installation, such as permitting and inspection—also known as "soft costs." All of SETO's funding programs are working toward improving the affordability of solar and making it easier for consumers to choose solar.

HOW WILL SOLAR IMPACT THE RESALE VALUE OF MY HOME?

Buying a solar energy system will likely increase your home's value. A **recent study** found that solar panels are viewed as upgrades, just like a renovated kitchen or a finished basement, and home buyers across the country have been willing to pay a premium of about $15,000 for a home with an average-sized solar array. Additionally, there is evidence homes with solar panels sell faster than those without. In 2008, California homes with energy efficient features and PV were found to sell faster than homes that consume more energy. Keep in mind, these studies focused on homeowner-owned solar arrays.

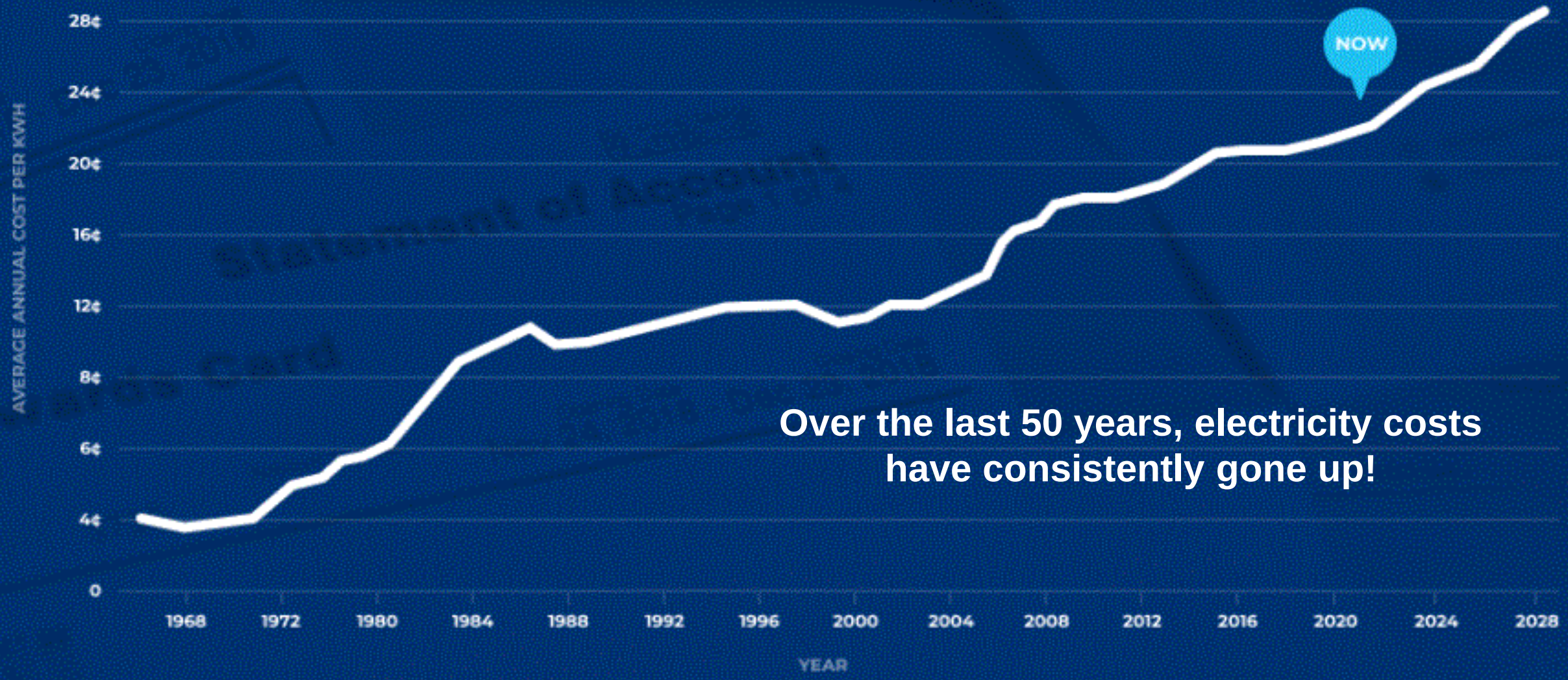
When it comes to third-party owned (TPO) systems, **data shows** that while they add some complexity to the real estate transaction, the overall impacts in terms of sales price, time on market, agreement transfers, and customer satisfaction are mostly neutral. In some cases, TPO systems can even add value.

IS SOLAR SAFE?

Absolutely! All solar panels meet international inspection and testing standards, and a qualified installer will install them to meet local building, fire, and electrical codes. Also, your solar energy system will undergo a thorough inspection from a certified electrician as part of the installation process.

Why Solar Now?

History indicates that homeowners who take no action to free themselves from the grid are going to pay more next year than they are today. See the graph to see how expensive energy could get.

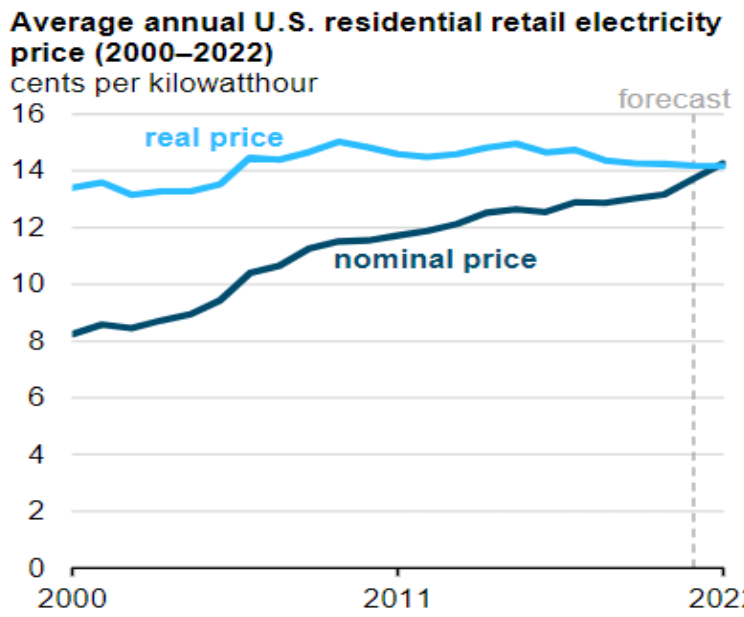


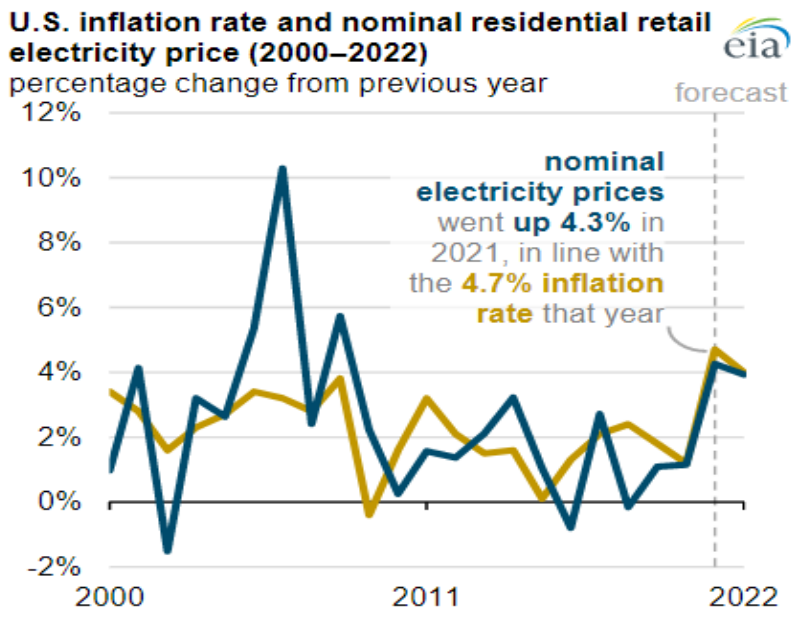
Over the last 50 years, electricity costs have consistently gone up!

TODAY IN ENERGY

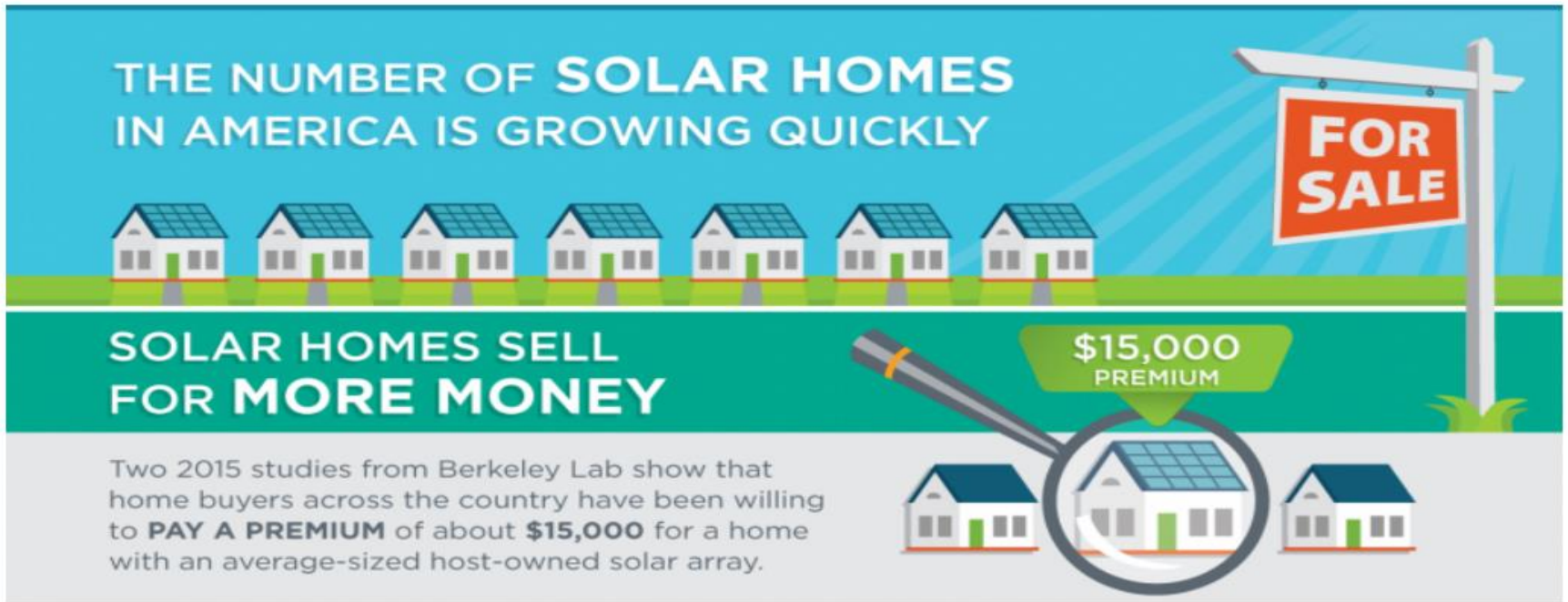
MARCH 1, 2022

During 2021, U.S. retail electricity prices rose at fastest rate since 2008





Source: U.S. Energy Information Administration, *Short-Term Energy Outlook*



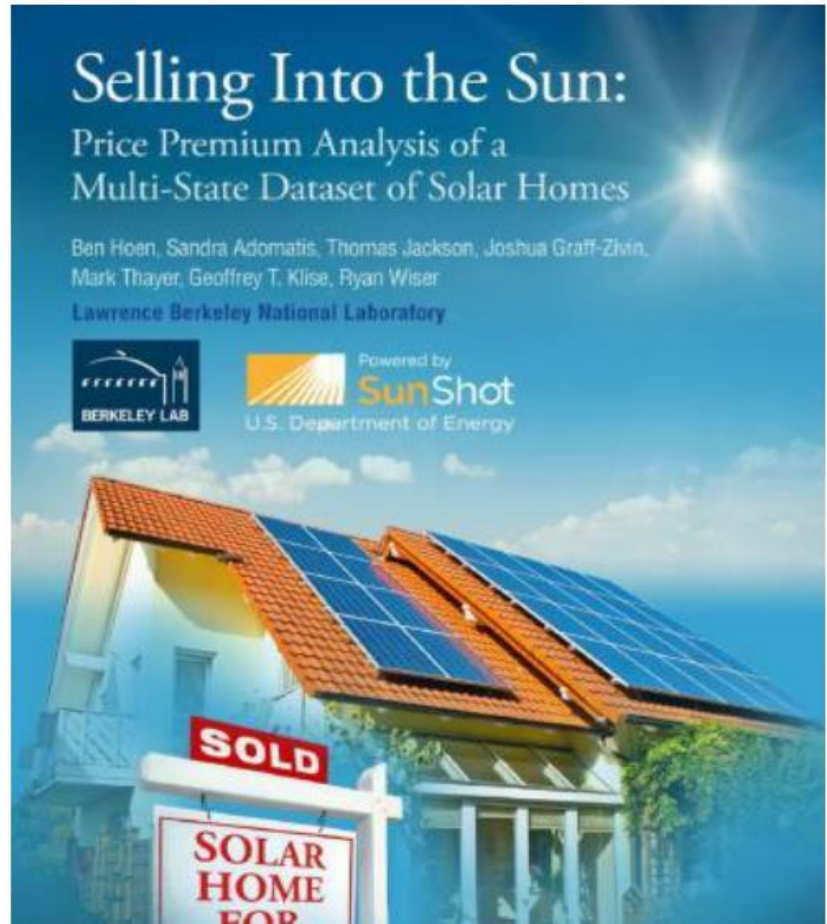
Buying a solar energy system will likely increase your home's value. A **recent study** found that solar panels are viewed as upgrades, just like a renovated kitchen or a finished basement, and home buyers across the country have been willing to pay a premium of about $15,000 for a home with an average-sized solar array. Additionally, there is evidence homes with solar panels sell faster than those without. In 2008, California homes with energy efficient features and PV were found to sell faster than homes that consume more energy. Keep in mind, these studies focused on homeowner-owned solar arrays.

Berkeley Lab Illuminates Price Premiums for U.S. Solar Home Sales

January 1, 2015

Largest-ever study quantifies the value of rooftop photovoltaics on homes that sold across eight states and 12 years

Berkeley, CA— A multi-institutional research team of scientists led by the U.S. Department of Energy's Lawrence Berkley Laboratory (Berkeley Lab), in partnership with Sandia National Laboratories, universities, and appraisers found that home buyers consistently have been willing to pay more for homes with host-owned solar photovoltaic (PV) energy systems —averaging about $4 per watt of PV installed—across various states, housing and PV markets, and home types. This equates to a premium of about $15,000 for a typical PV system. The team analyzed almost 22,000 sales of homes, almost 4,000 of which contained PV systems in eight states from 2002 to 2013—producing the most authoritative estimates to date of price premiums for U.S. homes with PV systems.



"Previous studies on PV home premiums have been limited in size and scope," says Ben Hoen, the lead author of the new report. "We more than doubled the number of PV home sales analyzed, examined a number of states outside of California, and captured the market during the recent housing boom, bust, and recovery."

More than half a million U.S. homes had PV as of 2014, and the number is growing rapidly. The growth in home PV systems means that the real estate industry will need reliable methods to value these homes appropriately. Further, having greater certainty in those methods will likely facilitate additional growth in the residential PV market.

SOLAR ENERGY

Solar Homes Sold 20% Faster, And For 17% More, NREL Study Finds

By Susan Kraemer Published October 23, 2010

10 Comments

National Renewable Energy Laboratory Documents

The National Renewable Energy Laboratory (NREL), located in Golden, Colorado, is the United States' primary laboratory for renewable energy and energy efficiency research and development. NREL is the only federal laboratory dedicated to the research, development, commercialization, and deployment of renewable energy and energy efficiency technologies. As part of its mission, NREL works closely with a number of private partners to transfer technological developments in renewable energy and energy efficiency technologies to the marketplace. NREL is a government-owned, contractor-operated (GOCO) facility, and is funded and overseen by the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE). This contractual arrangement allows a private entity to operate the lab on behalf of the federal government under a Management and Operating (M&O) contract. More information on NREL may be found at: http://www.nrel.gov/.

What is a tax credit?

A tax credit is a dollar-for-dollar reduction in the amount of income tax you would otherwise owe. For example, claiming a $1,000 federal tax credit reduces your federal income taxes due by $1,000. The federal tax credit is sometimes referred to as an Investment Tax Credit, or ITC, though is different from the ITC offered to businesses that own solar systems.

What is the federal solar tax credit?

The federal residential solar energy credit is a **tax credit** that can be claimed on federal income taxes for a percentage of the cost of a solar photovoltaic (PV) system. (Other types of renewable energy are also eligible for similar credits but are beyond the scope of this guidance.)

The system must be placed in service during the tax year and generate electricity for a home located in the United States. There is no bright-line test from the IRS on what constitutes "placed in service," but the IRS has equated it with **completed installation**.

In December 2020, Congress passed an extension of the ITC, which provides a 26% tax credit for systems installed in 2020-2022, and 22% for systems installed in 2023. (Systems installed before December 31, 2019 were eligible for a 30% tax credit.) The tax credit expires starting in 2024 unless Congress renews it.

There is no maximum amount that can be claimed.

Net Metering

Net metering allows residential and commercial customers who generate their own electricity from solar power to sell the electricity they aren't using back into the grid. Many states have passed net metering laws. In other states, utilities may offer net metering programs voluntarily or as a result of regulatory decisions. Differences between state legislation, regulatory decisions and implementation policies mean that the mechanism for compensating solar customers varies widely across the country

How Does Electricity Affect the Environment?

Electricity is an invisible and naturally occurring force that can be seen in such natural phenomena as lightning and the shock you sometimes get when you touch metal. The cultivation of electricity for human use offers numerous conveniences, but it can also harm the environment and increase health risks to people.

Climate Scientists Issue 'Red Alert' for Humanity – and Health

Climate 09/08/2021 • Madeleine Hoecklin

Share this:

Climate change is now an existential health problem overshadowing all others, say scientists in a major report by the Intergovernmental Panel on Climate Change (IPCC) – the world's largest and most comprehensive assessment of the state of the planet.

Related

Much More Needs to be Done About Unhealthy Impact of Meat

Climate

15/09/2021

More than One-Third of Countries Lack Enforceable Air Quality Standards – UN Environment Programme Calls for Reform

Climate

07/09/2021

200 Global Health Journals Warn of 'Runaway' Environmental Change if Temperatures Rise Above 1·5°C

06/09/2021

Do you really care about access and equity in global health? Your