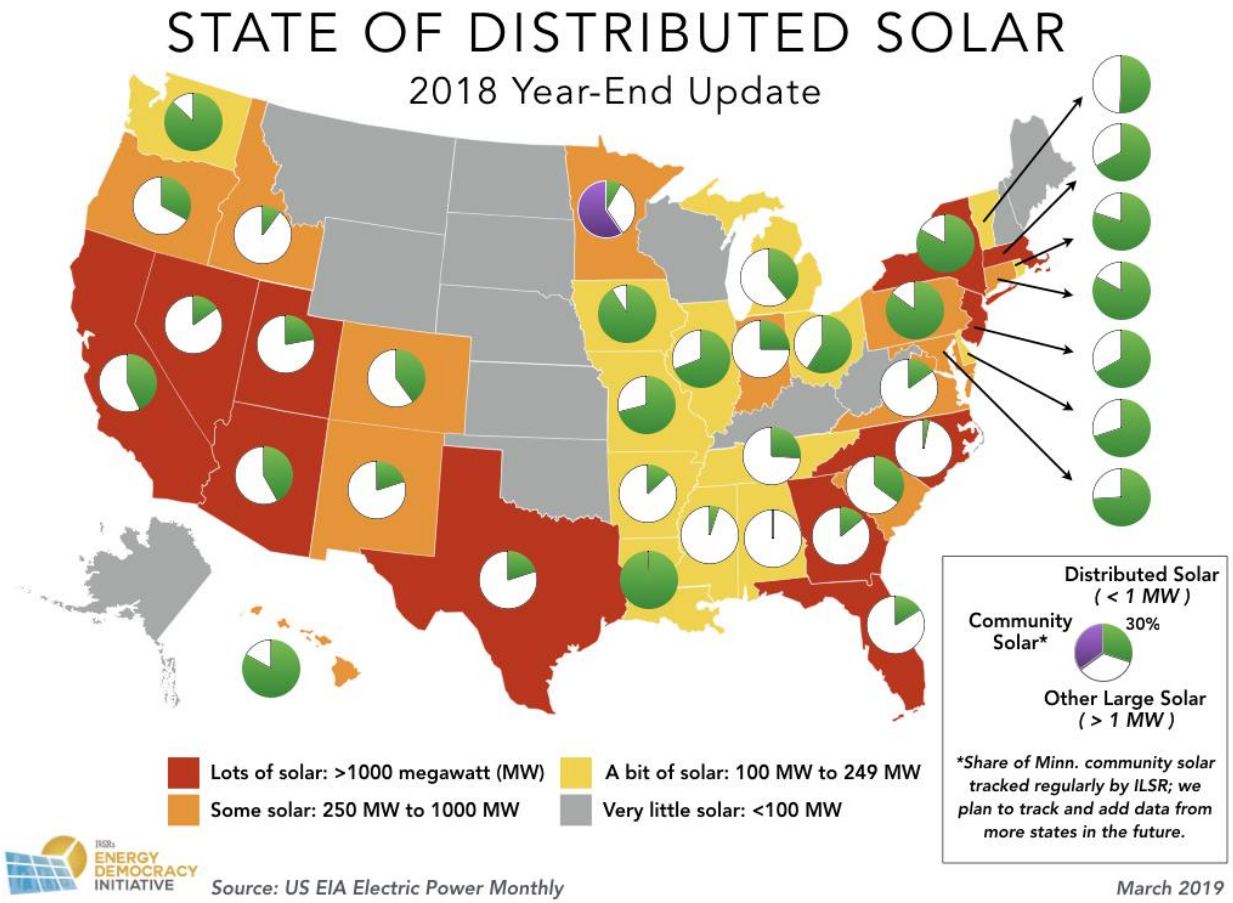
Renewable Energy beyond Subsidies - how incentives have grown the industry that is reshaping our energy systems.



In accordance with the Department of Labor and Industry's statute 326.0981, Subd. 11,

"This educational offering is recognized by the Minnesota Department of Labor and Industry as satisfying **1.5 hours** of credit toward **Building Officials and Residential Contractors** continuing education requirements."

For additional continuing education approvals, please see your credit tracking card.

Christopher LaForge

IREC Certified Master Trainer

NABCEP Certified Photovoltaic Installation Professional - Emeritus

31 years Operating Great Northern Solar

28 years Training with MREA and other organizations

Emeritus

Several of the supportive policies that grew the Renewable Energy (RE) industry are beginning to sunset or are being changed. These changes will shape the developments of the RE Industry for the near term and possibly for years to come.

RE now stands ready to grow without incentives and is changing much of how utilities and companies approach energy generation and use. Join us in this lively presentation and discussion of the future of Electricity for our nation and world.

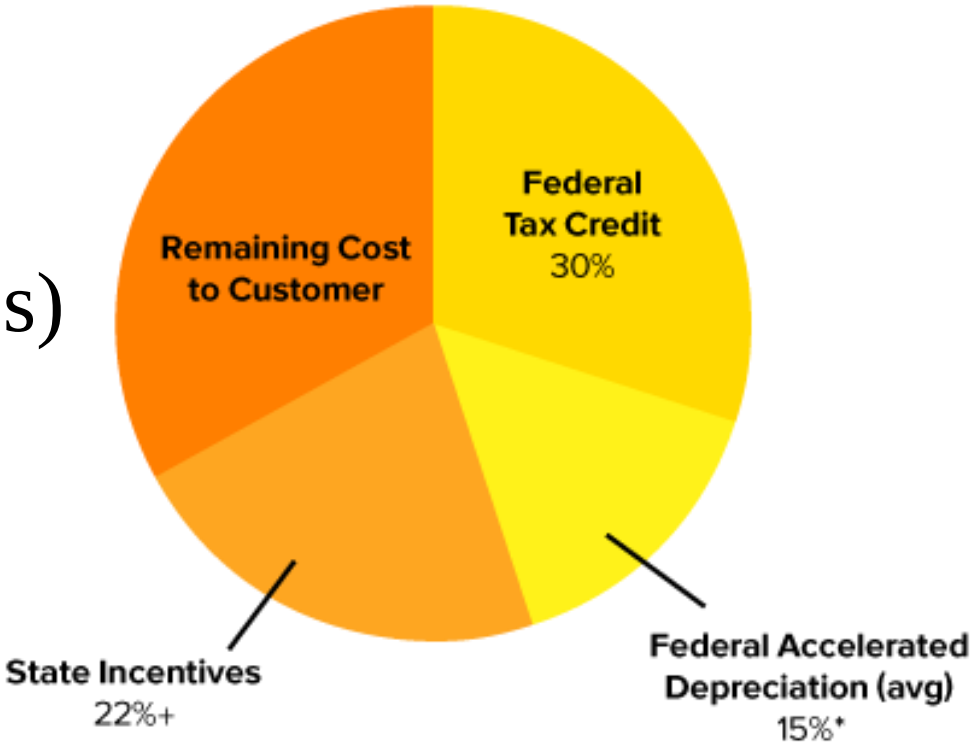
There are four main categories of solar incentive:

Federal Investment Tax Credit
Solar Renewable Energy Credits (SRECs)
Property Assessed Clean Energy (PACE)
State- and utility-specific incentives

- State tax credits
- Cash rebates
- Performance-based incentives (PBIs)

Other incentives for solar

- Accelerated depreciation
- Subsidized loans
- Tax exemptions



Federal investment tax credit

The federal government offered residential and commercial solar owners a federal tax credit which is a percentage of the system cost with no cap on the amount. This tax credit is received the first year you own your solar system. You can roll over the tax credit to subsequent years if you are unable to use all of the credit in the first year.

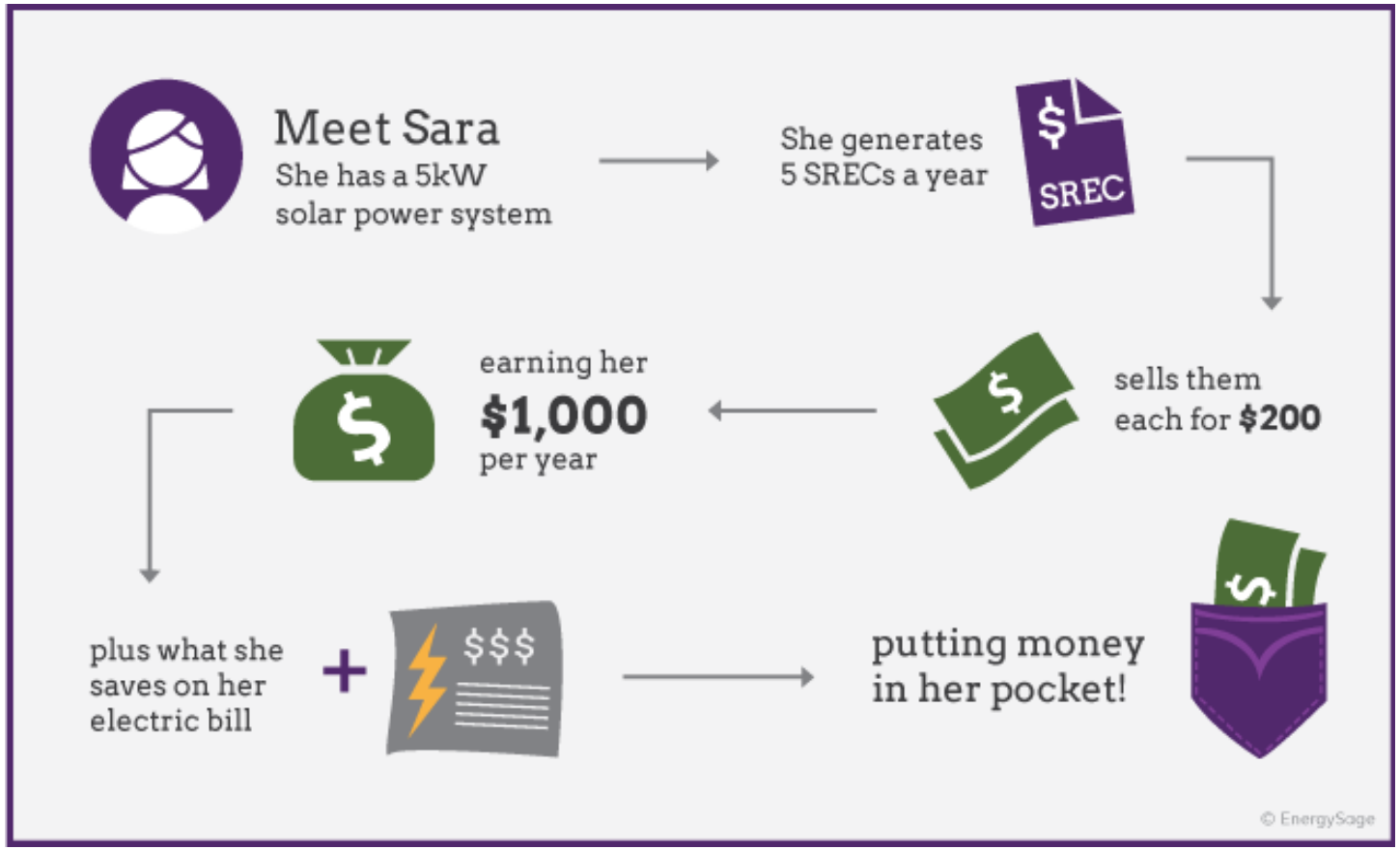
This tax credit was originally set to end in 2016, but it was extended until 2021 and it decreases
over the coming next 2 years…

Solar renewable energy credits (SRECs)

In some regions electricity generated from your system can generate an associated “green value” for your electricity. This value is called a Solar Renewable Energy Credit (SREC). For example when your system produces 1,000 kWh (1 MWh) of electricity, you may earn one SREC.

The value of SRECs varies over time and location. Depending on what state you live in SREC’s could be worth a significant amount of money over the life of your systems generation.

SREC's started when legislation in some states required utilities to generate a certain percentage of their electricity from solar power. If you live in one of these states, your system will generate solar renewable energy certificates (SRECs) for the amount of electricity produced by your solar system. Utilities may buy your SRECs so that they can count your solar power towards meeting their requirements. Selling your SRECs results in hundreds of dollars per year in income, depending on the SREC market in your state.

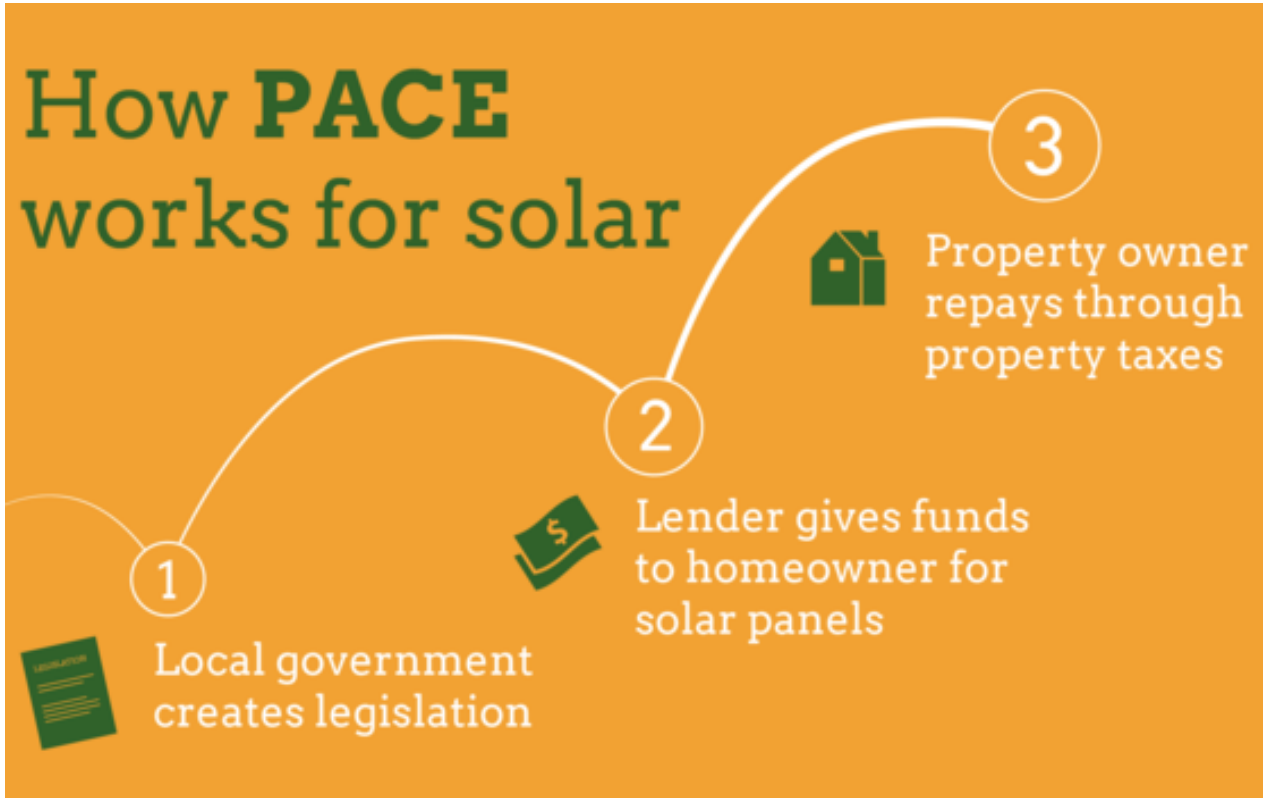


Courtesy Solar Sage

Property assessed clean energy (PACE)

The PACE model is designed to expand access to energy upgrades by creating access to low cost, long-term project financing. PACE-financed projects can include energy efficiency improvements, renewable energy systems, or a combination of the two.

PACE financing has building or homeowner contact their local PACE administrator, who secures financing for the project. The owner then repays that financing over a period of years through an assessment on the owner's property tax or utility bill.



State- and utility-specific incentives

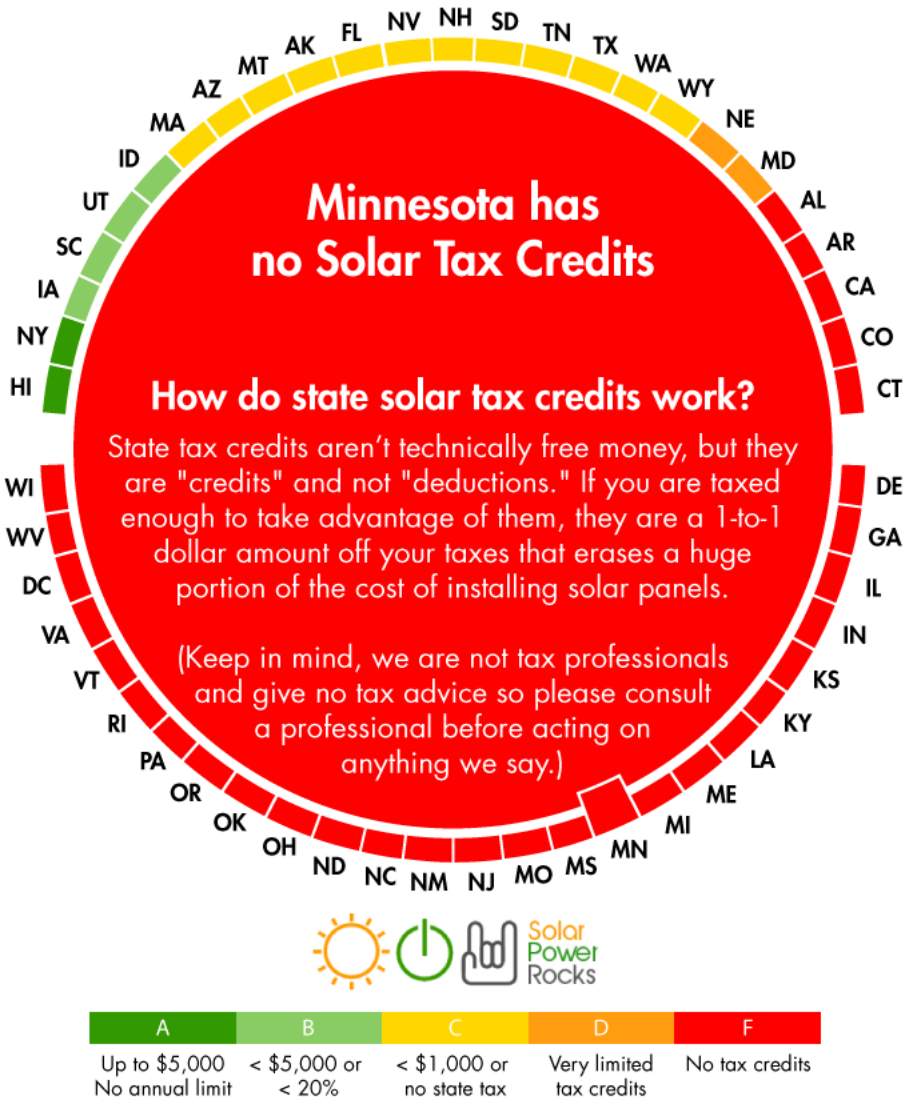
Some states offer state - or county- level incentives to residents. These can take a variety of forms; from grants, waiving permitting fees, offering additional assistance for low-income homeowners to go solar. Some utilities also offer special incentives for their customers. Check with the utility of your local to see your if there are any utility-specific incentives available in your area.

The Clean Energy Resource Team Web site can assist you in finding Minnesota incentives: https://www.cleanenergyresourceteams.org/solar-incentive-programs-serving-even-more-minnesotans.

In Wisconsin the Focus on Energy web site can assist you in finding Wisconsin incentives: https://focusonenergy.com/programs/solar-electric-systems.

State tax credits

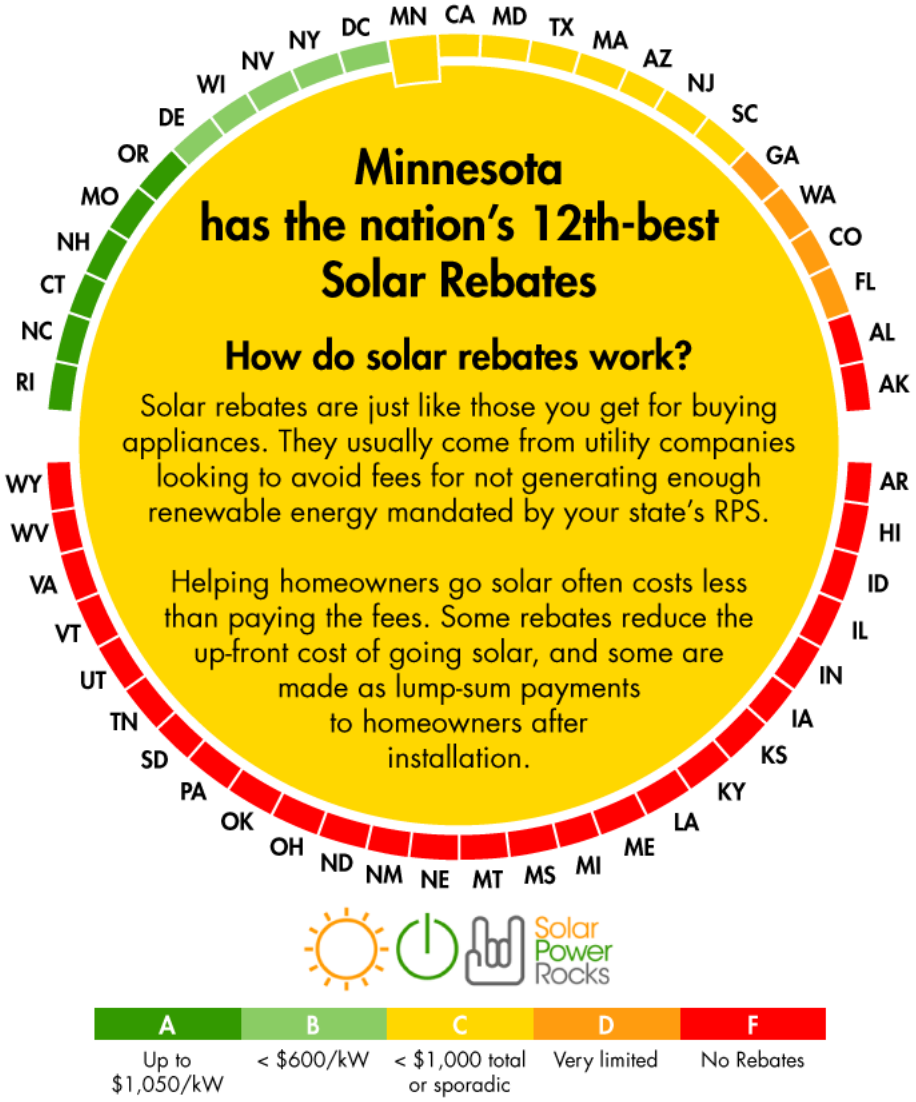
States often offer additional tax credits for installing a solar system. With a state solar tax credit, you deduct a portion of the cost of your solar system from your state tax bill, similar to the federal ITC. These amounts vary significantly by state.



Cash rebates

Some localities offer cash rebates. These come from your state, municipality, utility company, or other organization that wants to promote solar energy. Rebates are generally available for a limited time and end once a certain amount of solar has been installed.

Rebates often reduce your system costs by 10 to 20 percent.



Performance-based incentives (PBIs)

Some states or utilities offer performance-based incentives (PBIs), which pay solar energy system owners a per kilowatt-hour credit for the electricity that their systems produce.

PBI programs may require that you install equipment manufactured in your state to qualify. Unlike SRECs, PBIs don't have to be sold through a market, and incentive rates are determined when the system is installed. State policies are changing and PBIs may replace or exist alongside net metering policies.

Table 1. A 5kW System Under Step 2	
Average Monthly Residential Usage	602 kWh
Monthly Output of 5 kW PV System	660 kWh
Percentage of Usage Covered	110%
Net Upfront System Cost ($2.98/W)	$14,875
10-Year Electricity Savings ($0.11/kWh[1])	$7,946
10-Year PBI ($0.09/kWh)	$7,128

Accelerated depreciation

Businesses can write off the value of their solar energy system through the Modified Accelerated Cost Recovery System (MACRS), which reduces businesses' tax burden and accelerates returns on solar investments.

Qualified solar energy equipment is eligible for a cost recovery period of five years. Accelerated depreciation can reduce net system cost by up to an additional 30 percent.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Depreciation Basis	$42,500 *(basis after bonus depreciation)*					
Depreciation %	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%
Depreciation Expense	$8,500	$13,600	$8,160	$4,896	$4,896	$2,448
Bonus Depreciation	$42,500					
Total Depreciation	**$51,000**	**$13,600**	**$8,160**	**$4,896**	**$4,896**	**$2,448**

Subsidized loans

Some locals offer subsidized ”solar loans” with a reduced interest rate. These loans may be offered by your state, a non-government organization or your utility company. Often they are only available for a limited time.

Tax exemptions

States and municipalities may not include the value of solar systems in property taxes assessments. Even though the value of your property has increased by the addition of a solar power system, your property tax bill (in these locals) won't increase – it will remain the same.

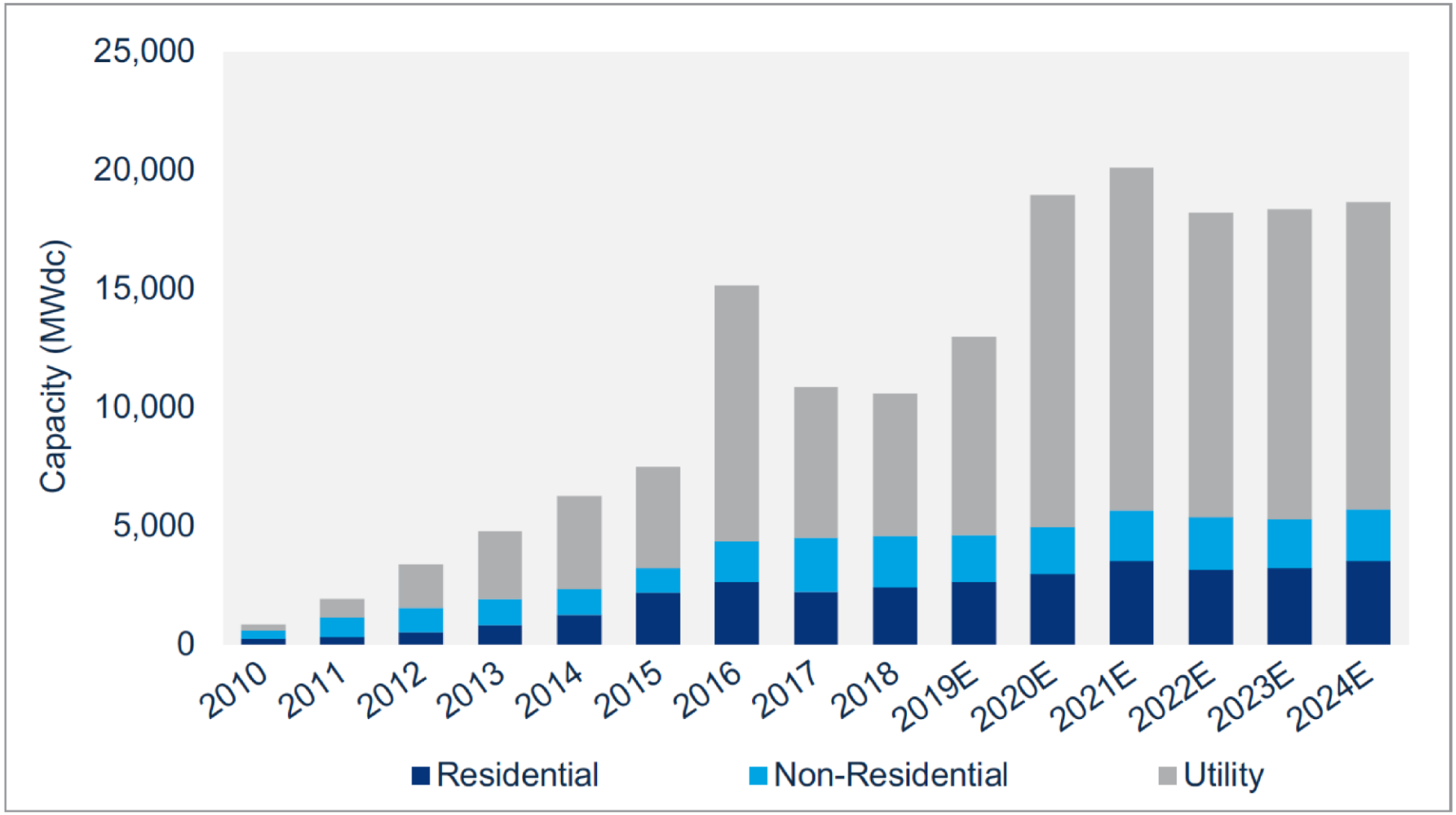
In addition, your solar system may be exempted from *state sales taxes*, which can result in significant additional savings depending on your state's sales tax rate.

As Incentives Evolve and the Major Federal ITC Sunsets What becomes of the Solar Industry –

Well… get ready for the next version of the Solar-coaster!

That Said – Industry experts Are cautiously optimistic about continued Success in all three segments of the solar installation market with continuing rapid expansion in the utility scale sector.

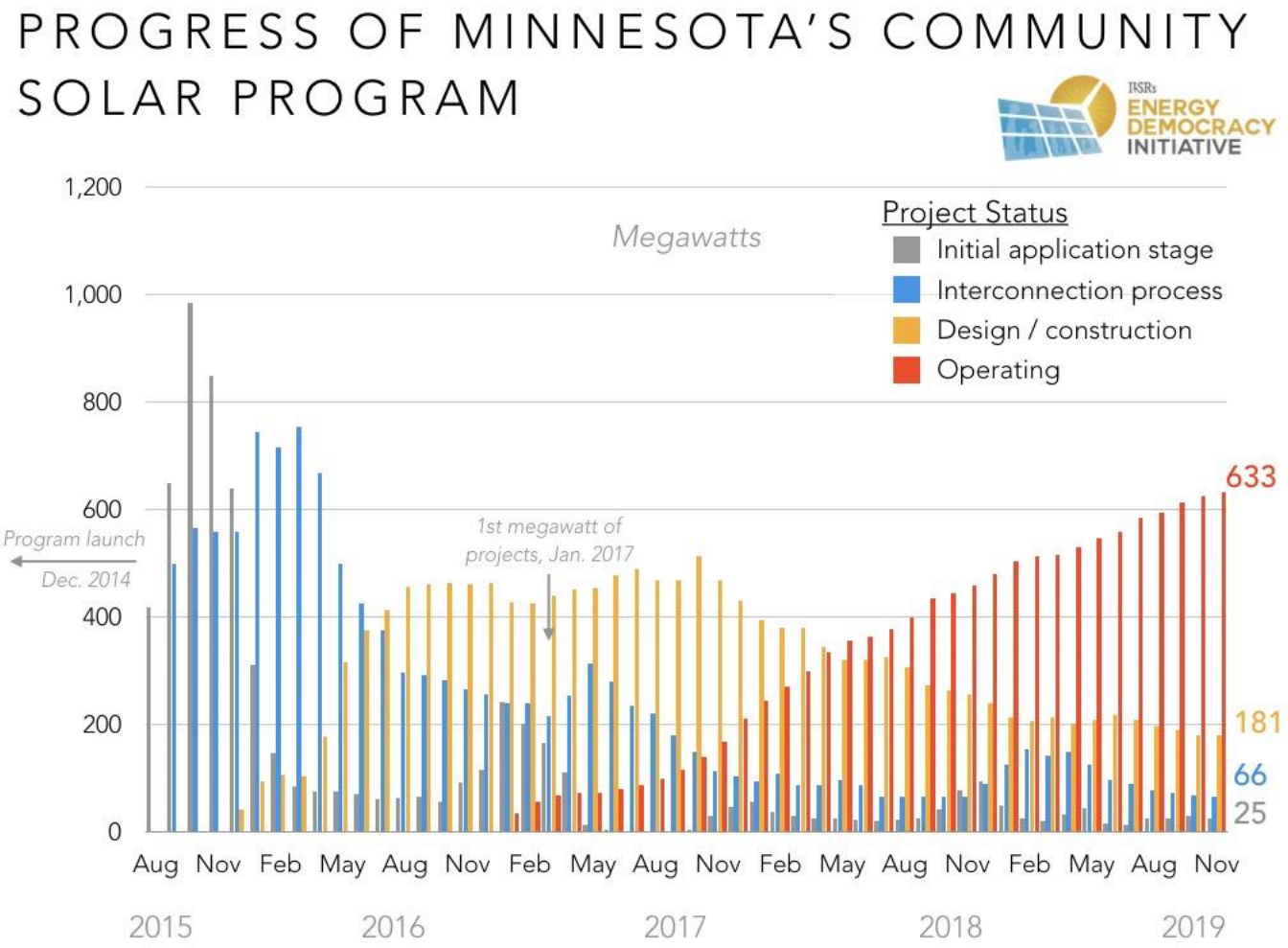
Figure 3.5 U.S. PV installation forecast, 2010-2024E



Source: Wood Mackenzie Power & Renewables

Creative programs like MN Community Solar Program incite more capacity and new market sectors -

Minnesota's community solar program hit a record 633 megawatts of operational capacity in November 2019. The chart above shows the progress of projects through the program since August 2015, and the nearly two-year lag between the program launch in December 2014 and the successful ignition of multiple megawatts of capacity in January 2017.



As Changes in the industry continue companies are diversifying their service offerings to bring greater diversity to their revenue streams and provide continuity through the coming incentive declines…

O&M stands to be a major growth sector of the solar industry –

There are several way approach O&M. A strong one is *preventative maintenance* - the routine inspection and servicing of equipment to avoid breakdowns and needless production losses. Corrective maintenance focuses on repairs after a breakdown occurs to minimize unplanned downtime. Condition-based maintenance, the use of real-time data to predict breakdowns and prioritize activities and resources, is becoming a premium offering by an increasing number of third party integrators and turnkey providers.

Each of these approaches employs some or all of a number of services like performance monitoring and diagnostics, energy forecasting, warranty administration, and preventative maintenance including module cleaning and vegetation control.

It can also involve integration with a third party for system commissioning, Supervisory Control and Data Acquisition (SCADA) upgrades, parts replacement, and re-roofing support.

Key players in the industry feel that the market has matured enough for the industry to continue to thrive:

From CivicSolar:

“With falling solar equipment prices and soft costs in the last five years, ambitious state and local renewable energy targets, and lucrative financial structures in place, solar is here to stay with or without the ITC.”

Paying attention to market trends and other influences is key to survival in the changing market:

PV system prices are at historic lows across the various market segments, despite the Trump administration's tariffs on imported equipment.

Recently the U.S. granted another round of tariff exemptions that includes bifacial modules, which are expected to play a larger role in the market in the years ahead.

"The energy yield gain of the bifacial module and tracker is 27 percent," said Fang, who will be discussing the outlook for solar modules during an upcoming panel discussion at GTM's Solar Summit in San Diego in May. Even when equipped with a tracker, the multi modules still had an energy yield 14.3 percent less than the combination of a bifacial modules and a tracker."

From GTM

Wood Mackenzie is the producer of GreenTecMedia (GTM) and provides in-depth industry analysis:

“WoodMac forecasts growth in the residential market of 5 to 20 percent during the 2019-21 period, pointing to new drivers like Maryland’s renewable portfolio standard increase, the removal of South Carolina’s net metering cap, and Illinois’ Adjustable Block Program. And California’s home solar mandate will begin fueling the market there beginning in 2020.”

Additional new elements to the Renewable Energy industry will spur significant growth:

SunRun shows its business savvy with a recent success:

"The San Francisco-based company won a 20-megawatt bid in the forward capacity auction for ISO New England, which operates the electric grid in six Northeastern states. That auction ensures that enough grid capacity will be online in 2022.
Unlike previous winners, Sunrun did not bid a traditional power plant. Its product is a network of small solar and battery installations that will go into roughly 5,000 customer homes across the region. The company is promising to aggregate across those systems to deliver the necessary power to the grid, while also keeping the host customers happy.

Sunrun has vocally promoted this vision, as it expanded from simply installing solar panels into battery storage and grid services business lines. Many other companies and analysts share the belief that distributed resources, acting together, can provide a cleaner, more resilient and cheaper alternative to centralized grid architectures.

With this win, Sunrun showed it could compete in an open auction alongside conventional resources like gas plants and hydropower."

From GTM

Fleets of aggregated home batteries and solar will provide capacity for New England's regional grid.

Additionally – Energy Storage developments are growing exponentially:

Incentives spur rapid storage growth in New York, outpacing distributed solar expansion: NYSERDA CEO

“However not all market growth will rely on the incentives. She said further storage deployment will be unlocked as market participation rules are implemented by the New York Independent System Operator (ISO).

Barton pointed to recent innovations with the grid operator in New England, where this year a behind-the-meter distributed solar and storage project bid into the capacity market. "We haven't seen anything like that take place in the New York ISO to date, and it's [due to] the way rules are structured," she said.

"Look at the end of the [New York ISO] queue, it's 5,000 MW" of storage, Barton said. "That's the single largest resource in the New York ISO queue. They know what's coming down the pike for them, they know that this resource is increasingly becoming kind of a go-to for a lot of system needs."

Given these trends, huge cost reductions and the need for mitigating the rapid onset of climate change the market for solar and Renewable Energy in general is set for steady growth as the Federal ITC sunsets.

Lets just tighten our seat belts and get ready for the ride!

Questions?

Thank you for your interest in Renewable Energy and our Collective future!

GREAT NORTHERN SOLAR