

Homeowner's Guide to the Federal Tax Credit for Solar Photovoltaics

Disclaimer: This guide provides an overview of the federal investment tax credit for those interested in residential solar photovoltaics, or PV. It does not constitute professional tax advice or other professional financial guidance. And it should not be used as the only source of information when making purchasing decisions, investment decisions, or tax decisions, or when executing other binding agreements.

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 \$1,000.¹

The U.S. Department of Energy Solar Energy Technologies Office

supports early-stage research and development to improve the affordability, reliability, and performance of solar technologies on the grid. The office invests in innovative research efforts that securely integrate more solar energy into the grid, enhance the use and storage of solar energy, and lower solar electricity costs.



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.² (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.³
 - A solar PV system must be installed before December 31, 2019, to claim a 30% credit. It will decrease to 26% for systems installed in 2020 and to 22% for systems installed in 2021. And the tax credit expires starting in 2022 unless Congress renews it.
 - There is no maximum amount that can be claimed.
- Your solar PV system was installed between January 1, 2006, and December 31, 2021.
 - The solar PV system is located at your primary or secondary residence in the United States, or for an off-site community solar project, if the electricity generated is credited against, and does not exceed, your home’s electricity consumption.⁴
 - You own the solar PV system (i.e., you purchased it with cash or through financing but you are neither leasing nor are in an arrangement to purchase electricity generated by a system you do not own).
 - The solar PV system is new or being used for the first time. The credit can only be claimed on the “original installation” of the solar equipment.

Am I eligible to claim the federal solar tax credit?

You might be eligible for this tax credit if you meet all of the following criteria:

What expenses are included?

The following expenses are included:

- Solar PV panels or PV cells used to power an attic fan (but not the fan itself)
- Contractor labor costs for onsite preparation, assembly, or original installation, including permitting fees, inspection costs, and developer fees
- Balance-of-system equipment, including wiring, inverters, and mounting equipment

- Energy storage devices that are charged exclusively by the associated solar PV panels, even if the storage is placed in service in a subsequent tax year to when the solar energy system is installed (however, the energy storage devices are still subject to the installation date requirements)⁵
- Sales taxes on eligible expenses.

How do other incentives I receive affect the federal tax credit?

For current information on incentives, including incentive-specific contact information, visit the Database of State Incentives for Renewables and Efficiency website at www.dsireusa.org.

Rebate from My Electric Utility to Install Solar

Under most circumstances, subsidies provided by your utility to you to install a solar PV system are excluded from income taxes through an exemption in federal law.⁶ When this is the case, the utility rebate for installing solar is subtracted from your system costs before you calculate your tax credit. For example, if your solar PV system was installed before December 31, 2019, cost \$18,000, and your utility gave you a one-time rebate of \$1,000 for installing the system, your tax credit would be calculated as follows:

$$0.3 * (\$18,000 - \$1,000) = \$5,100^7$$

Payment for Renewable Energy Certificates

When your utility, or other buyer, gives you cash or an incentive in exchange for renewable energy certificates or other environmental attributes of the electricity generated (either upfront or over time), the payment likely will be considered taxable income.⁸ If that is the case, the payment will increase your gross income, but it will not reduce the federal solar tax credit.

Rebate from My State Government

Unlike utility rebates, rebates from state governments generally do not reduce your federal tax credit. For example, if your solar PV system was installed before December 31, 2019, installation costs totaled \$18,000, and your state government gave you a one-time rebate of \$1,000 for installing the system, your federal tax credit would be calculated as follows:

$$0.3 * \$18,000 = \$5,400$$

State Tax Credit

State tax credits for installing solar PV generally do not reduce federal tax credits—and vice versa. However, when you receive a state tax credit, the taxable income you report on your federal taxes will be higher than it otherwise would have been because you now have less state income tax to deduct.⁹ The end result of claiming a state tax credit is that the amount of the state tax credit is effectively taxed at the federal tax level.

For example, the net percentage reduction for a homeowner in New York who claims both the 25% state tax credit¹⁰ and the 30% federal tax credit for an \$18,000 system is calculated as follows, assuming a federal income tax rate of 22%:

$$0.30 + (1 - 0.22) * (0.25) = 49.5\%$$

Note that because reducing state income taxes increases federal income taxes paid, the two tax credits are not additive (i.e.,

not 25% + 30% = 55%). For an \$18,000 system, the total cost reduction in this example would be:

$$[\$18,000 * 0.30] + [\$18,000 * (1 - 0.22) * (0.25)]$$

$$= \$5,400 + \$3,510$$

$$= \$8,910$$

Can I claim the credit, assuming I meet all requirements, if ...

...I am not a homeowner?

Yes. You do not necessarily have to be a homeowner to claim the tax credit. A tenant-stockholder at a cooperative housing corporation and members of condominiums are still eligible for the tax credit if they contribute to the costs of an eligible solar PV system. In this case, the amount you spend contributing to the cost of the solar PV system would be the amount you would use to calculate your tax credit. However, you cannot claim a tax credit if you are a renter and your landlord installs a solar system, since you must be an owner of the system to claim the tax credit.

...I installed solar PV on my vacation home in the United States?

Yes. Solar PV systems do not necessarily have to be installed on your primary



Solar PV system on a home in the Ozark Mountains. Photo credit Douglas Hutchings.

residence for you to claim the tax credit. However, the residential federal solar tax credit cannot be claimed when you put a solar PV system on a rental unit you own, though it may be eligible for the business ITC under IRC Section 48.¹¹

...I am not connected to the electric grid?

Yes. A solar PV system does not necessarily have to be connected to the electric grid for you to claim the residential federal solar tax credit, as long as it is generating electricity for use at your residence.

...the solar PV panels are on my property but not on my roof?

Yes. The solar PV panels located on your property do not necessarily have to be installed on your roof, as long as they generate electricity for use at your residence.

...I have a home office (or my residence is also used for a commercial purpose)?

Yes, but if the residence where you install a solar PV system serves multiple purposes (e.g., you have a home office or your business is located in the same building), claiming the tax credit can be more complicated. When the amount spent on the solar PV system is mostly used for residential rather than business purposes, the residential credit may be claimed in full without added complications. However, if less than 80% of the solar PV system cost is a residential expense, only the percentage that is residential spending can be used to calculate the federal solar tax credit for the individual's tax return; the portion that is a business expense could be eligible for a similar commercial ITC on the business's tax return.¹²

...I financed my solar PV system instead of paying for it upfront? (If so, how do I treat interest, origination fees, and extended warranty expenses?)

Yes. If you financed the system through the seller of the system and you are contractually obligated to pay the full cost of the system, you can claim the federal solar tax credit based on the full cost of the system. Miscellaneous expenses, including interest owed on financing, origination fees, and extended warranty expenses are not eligible expenses when calculating your tax credit.

...I bought solar panels but have not installed them yet?

No. The tax credit is only for systems that were "placed in service" during the year, meaning they are installed and producing electricity for the homeowner.

...I participate in an off-site community solar program?

The answer depends heavily on your specific circumstances. The IRS states in Questions 25 and 26 in its Q&A on Tax Credits¹³ that off-site solar panels or solar panels that are not directly on the taxpayer's home could still qualify for the residential federal solar tax credit under some circumstances. However, community solar programs can be structured in various ways, and even if you are eligible for the tax credit, it may be difficult to claim due to other tax rules.

For example, one arrangement is the creation of a "special purpose entity," where community members form and invest in a business that operates the community solar project. If your participation is limited to investing in the community solar project and you do not participate in the operation of the project on a regular, continuous, and substantial basis, you are constrained in taking advantage of the credit because you are considered a "passive investor." IRS rules require that a tax credit associated with a passive investment only be used against passive income tax liability, which only applies to income generated from either a rental activity or a business in which the individual does not materially participate. Many homeowners will therefore not

have passive income against which the credit can be claimed.¹⁴

Other Frequently Asked Questions

If the tax credit exceeds my tax liability, will I get a refund?

This is a nonrefundable tax credit, which means you will not get a tax refund for the amount of the tax credit that exceeds your tax liability.¹⁵ However, you can carry over any unused amount of tax credit to the next tax year.

Can I use the tax credit against the alternative minimum tax?

Yes. The tax credit can be used against either the federal income tax or the alternative minimum tax.

I bought a new house that was constructed in 2019 but I did not move in until 2020. May I claim a tax credit if it came with solar PV already installed?

Yes. Generally, you can claim a tax credit on the expenses related to the new solar PV system that already came installed on the house for the year in which you moved into the house (assuming the builder did not claim the tax credit)—in other words, you may claim the credit in 2020. For example, you can ask the builder to make a reasonable allocation for these costs for purposes of calculating your tax credit.

How do I claim the federal solar tax credit?

After seeking professional tax advice and ensuring you are eligible for the credit, you can complete and attach IRS Form 5695¹⁶ to your federal tax return (Form 1040 or Form 1040NR). Instructions on filling out the form are available at <http://www.irs.gov/pub/irs-pdf/i5695.pdf> ("Instructions for Form 5695," IRS).



A rooftop array perched on a coastal hill on the island of Vinalhaven in Maine. Photo credit William Byers.

Where can I find more information?

Ask Questions

Internal Revenue Service (IRS), 1111 Constitution Avenue, N.W., Washington, D.C. 20224, (800)829-1040.

Find Resources

- The federal statute and IRS guidance: 26 USC § 25D at www.gpo.gov and “Q&A on Tax Credits for Sections 25C and 25D” at www.irs.gov.
- Updated information on the current status of the ITC: Database of State Incentives for Renewables and Efficiency entry on “Residential Renewable Energy Tax Credit” at www.dsireusa.org. ■

Endnotes

¹ 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.

² 26 U.S.C. § 25D, <https://www.govinfo.gov/app/details/USCODE-2011-title26/USCODE-2011-title26-subtitleA-chap1-subchapA-partIV-subpartA-sec25D>.

³ IRS. 2018, March 2. IRS private letter ruling 201809003. <https://www.irs.gov/pub/irs-wd/201809003.pdf>. Note: A private letter ruling may not be relied on as precedent by other taxpayers.

⁴ The IRS has permitted a taxpayer to claim a section 25D tax credit for purchase of a portion of a community solar project (IRS. 2015, September 4. IRS private letter ruling 201536017. <https://www.irs.gov/pub/irs-wd/201536017.pdf>. Note: A private letter ruling may not be relied on as precedent by other taxpayers.)

⁵ Isaac L. Maron. 2018, March 26. “Residential Solar Storage is Eligible for Tax Credit, Subject to a 100% Cliff.” Tax Equity Times. <https://www.taxequitytimes.com/2018/03/residential-solar-storage-eligible-tax-credit-subject-100-cliff/>. Note: A private letter ruling may not be relied on as precedent by other taxpayers.

⁶ 26 U.S.C. § 136, <https://www.govinfo.gov/app/details/USCODE-2011-title26/USCODE-2011-title26-subtitleA-chap1-subchapB-partIII-sec136>.

⁷ If the project was placed in service in 2020, the percentage would drop from 30% to 26% and the tax credit would be 0.26 * (\$18,000 - \$1,000) = \$4,420.

⁸ IRS. 2010, September 3. IRS private letter ruling 201035003. <http://www.irs.gov/pub/irs-wd/1035003.pdf>. Note: A private letter ruling may not be relied on as precedent by other taxpayers.

⁹ The Tax Cuts and Jobs Act of 2017 placed a \$10,000 limit on state and local tax deduction, which may impact whether a state tax credit impacts federal taxable income.

¹⁰ New York’s 25% state tax credit is capped at \$5,000 for solar energy systems, regardless of cost, according to DSIRE (<https://programs.dsireusa.org/system/program/detail/80>).

¹¹ See 26 U.S.C. § 25D(d)(2), which specifies that eligible solar electric property expenditures must be “for use at a dwelling unit located in the United States and used as a residence by the taxpayer” (*emphasis added*).

¹² IRS. “Instructions for Form 5695.” <https://www.irs.gov/instructions/i5695>.

¹³ IRS. “Q&A on Tax Credits for Sections 25C and 25D.” Notice 2013-70. <https://www.irs.gov/pub/irs-drop/n-13-70.pdf>.

¹⁴ Jason Coughlin, Jennifer Grove, Linda Irvine, Janet F. Jacobs, Sarah Johnson Phillips, Leslie Moynihan, and Joseph Wiedman. 2010, November. *A Guide to Community Solar: Utility, Private, and Non-Profit Project Development*. <http://www.nrel.gov/docs/fy12osti/54570.pdf>.

¹⁵ Homeowners may get a tax refund at the end of the year due to the tax credit, if the reduction in tax liability means there was overpayment during the year. This can often occur when employers deduct taxes for employees over the course of the year. However, such refund is still limited by the taxpayer’s total tax liability.

¹⁶ IRS, “About Form 5695, Residential Energy Credits,” <https://www.irs.gov/forms-pubs/about-form-5695>.