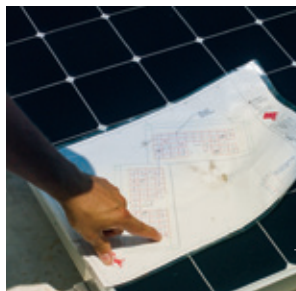


November 2020



DISTRICT SOLAR CONSUMER FINANCING GUIDE



acknowledgements



This guide is designed to help District of Columbia residents make informed decisions about financing solar. It is a DC-specific guide adapted from a 2015 report, [A Homeowner's Guide to Solar Financing: Leases, Loans and PPAs](#), prepared by the Clean Energy States Alliance (CESA).

This guide was produced by CESA and the Department of Energy and Environment (DOEE) for the District of Columbia under U.S. Department of Energy Solar Energy (DOE) Technologies Office Award Number DE-EE-0007667. Under this [project](#), CESA is working with five states—Connecticut, Minnesota, New Mexico, Oregon, and Rhode Island—and the District of Columbia to develop and implement low- and moderate-income solar strategies. The [U.S. Department of Energy Solar Energy Technologies Office](#) supports early-stage research and development to improve the reliability and performance of solar technologies.

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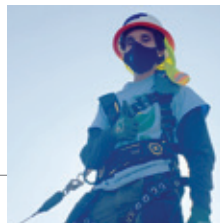
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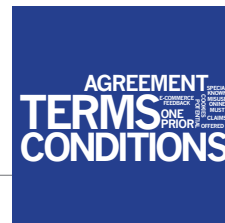
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introduction

Are you a DC resident thinking about going solar and trying to figure out how to pay for it? Perhaps you are debating whether to purchase the system or finance it. Perhaps you do not know about available financing options.

If you are thinking about going solar, there is good news: the price of solar photovoltaic (PV) systems has dropped dramatically in recent years, and there are more ways to pay for it. But with many solar options available, the marketplace for these products has become increasingly complex. It can be hard to choose among the different packages and vendors. The differences between them may not be easy to understand. Some contracts are filled with confusing technical jargon, and key terms can be buried in the fine print of a customer contract.

“This guide is designed to help homeowners make informed decisions about financing solar.”

This guide is designed to help you make informed decisions and select the best option for your needs and finances. The purpose of this guide is to:

1. Explain the difference between rooftop solar and community solar.
2. Provide an overview of payment options for community solar.
3. Describe three popular financing choices—leases, Power Purchase Agreements (PPAs), and loans—for rooftop solar, and explain their advantages and disadvantages as well as how they compare to a direct cash purchase.
4. Summarize District programs that help people pay for solar, including the Solar for All program, which is specifically intended for low- and moderate-income residents.

This guide does not cover technical considerations related to photovoltaic system siting, installation, and interconnection with the electricity grid.

5. Explain key solar financing terms and provide a list of questions you might consider before deciding if and how to proceed with solar.
6. Provide a list of other resources to help you learn more about financing solar, as well as some other DC-specific solar resources.

Rooftop Solar vs. Community Solar

There are two main options for going solar in the District of Columbia:

1. Installing solar on your own roof (or, if you have enough space and sunlight, somewhere else on your property).
2. Signing up for community solar. With community solar, multiple customers subscribe to a solar array located somewhere else serving the District's electricity grid, and each subscriber receives credits on their electric bill for the electricity generated by their portion of the array.

Community solar can be a particularly good choice if you cannot put solar on your own roof. This may be the case if you rent rather than own your home or if your roof gets lots of shade or doesn't face the optimal direction.

The number of community solar projects in the District is limited, and it may be difficult to find a project to sign up for. As a result of the District's ambitious climate and clean energy policies, the number of projects is expected to increase, so it should become easier for interested customers to find one.





financing

Options

Rooftop Solar

The size of a residential solar PV installation can vary but is generally between 2 to 15 kilowatts (kW) depending on a variety of factors. A kilowatt is a measure of 1,000 watts of electrical power. A 6.5-kW system in the District produces about as much electricity as the average District household uses in a year.¹ Factors include available roof space, roof direction and shading, the electricity usage of the home, and available financing.

“Financing innovations have helped fuel the exponential growth of the solar market in the United States.”

A system’s size is, unsurprisingly, a key determinant of its cost.² A residential solar PV system usually costs between \$15,000 and \$30,000.³ Paying that much money upfront is difficult for most people. That’s where solar financing comes into play.

New financing options have helped fuel the rapid growth of the solar market in the United States and fall into two broad categories: third-party ownership or homeowner ownership via a loan. The types of financing are compared later in this guide.

Some solar companies will arrange for the installation of a solar system and also provide financing. In other cases, the developer is different than the lender, which might be a bank or a credit union.

The two common types of third-party ownership arrangements are *solar leases* and *power purchase agreements*.

Third-Party Ownership: Third-party ownership of residential solar systems allows homeowners to avoid high, upfront costs and spread out payments over time. The third-party owner takes advantage of all available incentives and often takes on some or all the responsibility for system operation and maintenance. Currently, more than 40 percent of homeowners in the United States who install solar take advantage of third-party ownership.

The two common types of third-party ownership arrangements are *solar leases* and *power purchase agreements* (PPAs). In both cases, a homeowner enters into a contract with a project developer. The project developer installs, owns, and operates a solar system on the homeowner's property, and the homeowner gets all the electricity produced by the system. With a lease, the homeowner makes scheduled (usually monthly) payments to the developer that are pre-determined, regardless of how much electricity the system generates. With a PPA, the homeowner's payments depend on how much electricity the system generates.

Loans: A loan is another popular way for homeowners to pay for solar. Similar to leases and PPAs, loans allow customers to spread the system's cost over time, but the customer still owns the system. Solar loans have the same basic structure as other kinds of loans and are offered by an increasing number of lending institutions—from banks and credit unions to solar manufacturers, state green banks, and financing programs. Depending on loan rate, loan term, and the system's annual energy production, it is often possible to cover loan payments with the energy savings on your utility bill.

Unlike with third-party solar ownership, the customer receives District and federal incentives and is usually responsible for things like system maintenance.

Community Solar

Different community solar projects may offer different options for paying for a subscription. In some cases, financing options for community solar closely mirror the options for rooftop solar: community solar subscriptions may be paid for through a loan and an upfront payment, through a lease, or through a per-kilowatt-hour charge. A kilowatt-hour (kWh) is a unit of measurement that equals the amount of energy you would use if you kept a 1,000-watt appliance running for an hour. In other cases, community solar developers have created variations on these options, and the payment method for the subscription may not exactly fit the definition of a loan, a lease, or a PPA.



The District is offering incentives to offset the cost of solar systems, or no-cost subscriptions to community solar projects, to some income-qualified customers.

The best things you can do are to read your contract carefully, make sure you understand it before you sign it. Ask the developer for an estimate of how much money you are likely to save over the course of your contract, how long are you subscribed for, and how will the rate change over time. You also may want to ask to see the calculations behind the estimate. It is a good idea to get at least three quotes and compare terms and conditions of the service providers before you make a decision.

Solar for All: No-Cost Solar for Income-Qualified Customers

The District has a program called Solar for All, which is designed to use solar to reduce the electric bills of 100,000 low-to-moderate income households by 50 percent by 2032. In order to achieve this, the District is offering incentives to offset the cost of solar systems, or no-cost subscriptions to community solar projects, to some income-qualified customers. Under the Solar for All program, some residents will own the systems; others will receive the benefits of solar at no cost through third-party ownership models. See doee.dc.gov/solarforall for more information, including income guidelines.





What you need to know

about Leases, PPAs, and Loans

Solar Leases

A solar lease involves a scheduled payment, usually monthly. With a solar lease, a developer installs and owns the solar system on the home. In return, the homeowner pays a series of scheduled payments to the developer. A typical lease term is 20 years. In some cases, some or the entire lease can be pre-paid to reduce the overall cost and improve the economic return for the customer.

Because a lease agreement can deal with system maintenance in a variety of ways, it is important to clearly understand who is responsible for which maintenance costs. A solar PV system may require maintenance or replacement of parts during the lease contract term. It's important to read the fine print and ask questions.

“Solar leases can be attractive to homeowners because of their relative simplicity compared to PPAs.”

A solar lease can eliminate most or all of the upfront cost of a system and leave operations and maintenance responsibilities to a third-party owner. Although homeowners who enter into a lease pay a set price, they do not know for certain how much electricity the solar panels will produce. Therefore, the homeowner cannot know exactly how much money they will save on their electric bills. (This is also true of homeowners who own a solar system.) If monthly electric bill savings are greater than the lease payments, then the customer usually comes out ahead financially, though fees and any possible penalties also need to be considered.

Many solar leases come with an escalating (increasing) payment schedule, described in more detail on page 11. Homeowners should thoroughly examine escalating payment schedules when

Ideally, a homeowner's PPA per-kilowatt-hour payments will be less than the retail electricity rate, making the transaction cash-flow positive from day one.

considering a particular lease. If you sign a solar lease, any applicable federal tax credits go to the system owner. Solar Renewable Energy Credits (SRECs) also go to the system owner. See page 14 for more information on SRECs.

The Solar Access to Public Capital (SAPC) working group, convened by the National Renewable Energy Laboratory, has developed a [model solar lease](#) that has been endorsed by the national solar trade organization Solar Energy Industries Association (SEIA). This model lease can be a useful reference, and you may want to ask your vendor to include parts of it in your contract.

Solar Power Purchase Agreements (PPAs)

Under a residential solar PPA, a solar finance company buys, installs, and maintains a solar system on a homeowner's property. The homeowner purchases the energy generated by the system on a per-kWh basis through a long-term contract. This allows the homeowner to use solar energy at a set per-kWh rate while avoiding the upfront cost of the solar system and steering clear of system operations and maintenance responsibilities.

A homeowner's PPA per-kWh rate is generally less than the retail electricity rate, making the transaction cash-flow positive from day one. You should look carefully at your electricity bill to see how your current rate compares with the rate proposed by the company offering the PPA. You can ask your contractor to calculate the projected per-kWh rate and annual savings. Again, make sure you consider any escalator clause (page 11), as well as fees and possible penalties.

As with a solar PPA, because you would not own the system, any applicable federal tax credits go to the system owner. SRECs would also go to the system owner, described in more detail on page 14.

A [SAPC working group model PPA](#) contract has been endorsed by SEIA. As with the model lease, the model PPA contract can be a useful reference, and you may want to ask your vendor to include parts of it in your contract.



With some solar loans,
the solar PV system
can start saving the
homeowner money
right away.



Solar Loans

Loans allow customers to borrow money for the purchase of a solar PV system. With this approach, the homeowner owns the installed system. A wide variety of loans is available with different monthly payment amounts, interest rates, lengths, credit requirements, and security mechanisms. A loan that you use to pay for a solar system can either be a general purpose loan, like a home equity loan, or a loan specifically designed and offered to pay for a solar system. Some solar loan products allow bundling of energy efficiency improvements with the solar PV installation or allow you to include roof replacement.

Some loans require an asset to serve as collateral to secure the loan. When the lender takes a security interest in the solar customer's home, it is called a home equity loan. This means that if you default on the loan, the bank may seize your house. Think carefully before you sign a home equity loan, especially if you might have trouble making your loan payments. Other loans do not require an asset to secure the loan other than perhaps the solar system itself. These are called unsecured loans and generally have higher interest rates than secured loans.

With some solar loans, the solar PV system can start saving the homeowner money right away because the monthly loan payments are less than the savings on your electricity bill. On the other hand, if a homeowner wishes to have only a short-term loan, they may not save money right away, but it will shorten the time needed to enter the post-loan period when monthly savings will be much greater.

Lenders for solar loans can be banks, credit unions, solar developers, or other private solar financing companies. The District has established a "green bank," which may be able to help finance solar projects. See below for more information.

DC Green Bank

In 2018, the District passed a measure to establish a DC Green Bank, a quasi-governmental financing institution that will provide low-interest loans for clean energy and energy efficiency up-grades. These loans can help pay for "green" projects such as solar energy. The DC Green Bank designed its programs specifically to benefit District residents and has begun issuing loans. Its goals are to expand renewable energy, lower energy costs, reduce greenhouse gas emissions, create green jobs, and enhance resilience. See dcgreenbank.org for more information.

AGREEMENT TERMS CONDITIONS

SPECIAL
KNOWN
MISUSE
ONLINE
MUST
CLAIMS
OFFERED
COOKIES
POTENTIAL
E-COMMERCE
FEEDBACK
ONE
PRIOR

common issues and terms

in Solar Financing

It is important to understand the different issues and common terms in solar financing.

- **Bulk Purchase:** When you band together with other customers and buy products in bulk, you can often get a better deal. A solar bulk purchase involves a group of people, often from the same neighborhood, joining together and choosing a single solar contractor to install solar on all their homes. A contractor that doesn't have to spend time and resources marketing to each individual customer can afford to charge less money for an installation. Once the contractor has been chosen, each homeowner signs a separate contract with that contractor.
- **Buyout Options:** Many third-party financing contracts allow the homeowner to buy out or pay off the remaining payments in one lump sum after a certain period of time. Look to see if the contract has a buyout option. If so, under what circumstances can a customer buy out of a contract, and how is the buyout price calculated? If a clear buyout option is not included in the offer, the customer can try to request one. Be sure to find out from the provider whether the SRECs will be under your control when you buy out the system.
- **Contract Term:** Contract term (or contract duration) refers to the amount of time a solar financing agreement lasts. Most residential financing contracts last between 5 and 25 years. By way of comparison, solar panels typically come with a 20- to 25-year warranty and their productive lifespan can be longer. Inverters, which convert the direct current (DC) output of a PV panel into alternating current (AC) that can be used by the electrical grid, have separate warranties, typically between 5 to 10 years, though some are longer.

Many third-party financing contracts contain a clause that increases a customer's monthly payment on an annual basis.



At the end of a solar lease or PPA term, the homeowner will often have several options: (1) renew the contract and continue the monthly payments; (2) purchase the system at a designated price or the fair market value of the system, which may or may not be negligible after the term of a contract; or (3) have the third-party lender arrange for system removal. In the case of a solar loan, the homeowner will continue to own the system after the loan is fully paid off.

- **Credit Requirement:** Lenders require a credit (or “FICO”) score to enter into most financing contracts. Many loans, leases, and PPAs are only available to customers who have a credit score of 680 or higher. Some financing arrangements may be available to customers with sub-680 credit scores, but they may come with higher interest rates. A credit score below 650 will disqualify most homeowners from most third-party financing options.
- **Down Payment:** Some financiers offer options for how much money a customer has to put down initially. Most initial down payments range from zero dollars to \$3,000. By putting some upfront money down toward the cost of a solar system, the homeowner will likely receive a lower monthly payment and a shorter contract term (in the case of a solar lease or loan), or a lower per-kWh rate (in the case of a PPA). With a down payment, some third-party lenders will waive or reduce escalators.
- **Escalators:** Many third-party financing contracts contain a clause that increases a customer's monthly payment on an annual basis. In theory, this accounts for inflation and projected annual increases in electricity rates. The increase is often referred to as an annual “escalation clause,” “escalator clause,” or simply an “escalator.” In many leases and PPA contracts, payments escalate at an annual rate between 1 percent and 3 percent. Escalation clauses should be closely examined for reasonableness. While the average residential electricity rate in the District has not increased over the past decade,⁴ future electricity prices are impossible to predict with certainty. The average annual rate of inflation over the last 10 years was 1.6 percent.⁵

The escalator is a compounding rate, meaning that it applies not just to the initial payment rate but to the increases added each year due to the escalation charges. For example, if the payment rate for a PPA is 12 cents per-kWh in the first year, with an annual escalator of 3 percent, the customer will be paying 18.2 cents per-kWh in year 15. But if the escalator is only 1 percent, the customer will only be paying 13.8 cents in year 15. It is good to calculate or ask for a table of each year's payment rate.

Solar panels can add significant value to a home, especially if you own them.



- **Homeownership Transfer Provisions:** It is important to look for contract terms that explain what happens in the case of a transfer of home ownership. Under a third-party ownership model, the homeowner can usually transfer the solar lease or PPA to the next homeowner for the remainder of the contract term, provided the new owner is approved. (Usually a credit score qualifying a person for a mortgage also qualifies them to take over the third-party lending agreement.)

Solar panels can add significant value to a home, especially if you own them; however, third-party solar ownership can be a complicating factor during the sale of a home. Some buyers may be wary of buying a house with a solar system. If a solar system is third-party owned, a seller may have to buy the system outright before transferring the home, so the system can be removed upon transfer. With a relatively limited history of solar home sales data, it can be difficult to calculate the value of a residential solar system during the home sales process, especially when a system is third-party-owned and the buyer will assume the remaining lease or PPA payments. Examine the parts of a contract that relate to ownership transfer to determine available options if the home is sold before the end of the contract term.

If you have a solar loan, be sure to check whether the loan can be paid off before the end of the term. You may want to consider paying off the loan as part of your home sale. If you have a community solar subscription, you should be able to take it with you when you move to a new home, as long as your new home is in the District. Read your contract to find out what happens if you move out of the District.

- **Minimum Production Guarantees:** Some leases and PPAs offer solar production guarantees, usually in terms of a certain number of kilowatt-hours of electricity produced per year. With such a guarantee, the third-party owner will compensate the homeowner on a per-kWh basis for any shortfall. Prospective solar lease or PPA customers should check to see if a minimum production guarantee is included in their contract and what compensation is provided in case of a production shortfall, including whether compensation is based on a wholesale or retail per-kWh price. When a customer directly owns a solar system, no production guarantees are provided unless offered by a panel manufacturer or installer.
- **Net Metering:** Net metering enables solar system owners to use their solar electricity generation to offset their electricity consumption. The electricity that a home solar system produces is either

Net metering enables solar system owners to use their solar electricity generation to offset their electricity consumption.



consumed immediately by the homeowner or sent to the grid. With net metering, if the electricity is sent to the grid, the homeowner receives credits that can be used to pay for electricity at another time. For community solar subscribers, all the electricity produced by their portion of an array is sent to the grid, and the subscriber receives credits that can be used to pay for electricity the subscriber uses at home.

- **Operations and Maintenance:** With a lease or PPA, the third-party owner will likely cover operations and maintenance over the course of the contract. It is important to check your contract because some lease contracts may divvy up responsibilities differently. In most cases, the third-party owner also incurs accidental risks associated with panel ownership, including unforeseen destructive events or panel malfunction. In some cases, solar leases or PPAs may require homeowners to increase their homeowner's insurance to cover risks associated with the system.

With a solar loan, the customer owns the system directly and therefore has the responsibilities associated with ownership. A homeowner who owns a solar system outright or finances it through a loan may be responsible for insuring the solar PV system, which could be added to homeowner's insurance or an existing property policy.

- **Pre-Payment:** A pre-payment option for a lease or PPA allows homeowners to pay some or all of the payments for a PV system before the payments become due. Full, upfront pre-payment can allow a homeowner to reap some of the benefits of third-party ownership, such as maintenance coverage, while avoiding ongoing interest payments.
- **Production Estimates:** Residential solar systems should come with electricity production or output estimates. (An estimate, of course, is not the same as a guarantee.) System under-performance can be costly for a solar homeowner. This may be less of a problem under a PPA because the homeowner only pays for the amount of electricity actually produced by the system. Be sure your installation company explains to you what it considered, including the expected level of shading, when producing your solar production estimate.
- **Solar Incentives:** The federal government and the District both offer incentives for owners of solar systems:

The federal government provides a 26 percent federal investment tax credit (ITC) for the purchase of residential solar systems.



- **The Federal Investment Tax Credit (ITC):** The U.S. tax code currently provides a tax credit for owners of solar systems who can take a one-time income tax credit, based on their installed system cost. If you own your solar system directly, you are eligible to claim this tax credit after your system installation has been completed and is ready to be “placed in service.” For 2020, this tax credit, sometimes referred to as the federal investment tax credit or “ITC,” allows homeowners to claim a credit equivalent to 26 percent of qualified installed system costs. The ITC will decline to 22 percent in 2021. The ITC is scheduled to end in 2022 for residential system owners. A similar solar tax credit for businesses will step down on the same schedule, except that in 2022 it will permanently revert to 10 percent rather than sunset entirely. Companies providing leases and PPAs to residential solar customers may be eligible for the commercial tax credit and may be able to pass along the financial savings to their residential customers. If you directly own your solar system and don’t pay any federal income tax, you won’t benefit from the residential ITC because it’s a tax credit applied to taxes owed. If you have some tax liability but it’s not sufficient to make use of your whole credit in one year, you can apply small portions of the credit amount over several years. Many contractors and online solar calculators will assume that you are eligible for the ITC and will include it in their calculations when they are estimating your savings, so make sure that you understand whether you will be able to take advantage of it.
- **District of Columbia SRECs:** Solar Renewable Energy Certificates (SRECs) are created when solar panels generate electricity. They represent the environmental value of solar power, and SRECs can be bought and sold. Whoever owns the SRECs has the legal right to say that they used that renewable power. This right is valuable to the utility company, which is required to supply a certain amount of its power from solar. It is also valuable to businesses that want to say they use solar electricity. If you own your solar PV system, you have the option of keeping your SRECs or selling them. SRECs in the District are especially valuable and selling them can help DC residents save money with solar. If you want to sell your SRECs, your installer can help you with the necessary paperwork.⁷ Consumers should be aware that some options for purchasing solar in the District involve the homeowner signing over rights to all SRECs produced by the system over its lifespan to lower the upfront installation costs.

Remember that the ITC and SRECs are only available to the owners of a solar system. Homeowners who have a lease or a PPA with a third-party system owner cannot take advantage of these incentives. Instead, the third-party owner will receive the incentive benefits. Under a loan arrangement where a solar customer owns the solar system, the solar customer may be able to take direct advantage of the ITC and SRECs. Talk with a tax advisor before assuming you will be eligible for any tax deductions or tax credits.



Finding a financing option that works for you

What Makes a Solar Financing Program More Likely to Work Well for Low- and Moderate-Income Customers?

Remember the District's Solar for All program provides no-cost solar for some income-qualified customers. Most of the issues listed below will not apply to customers participating in Solar for All.

“Some financing programs are likely to work better for low- and moderate-income customers than others.”

Some financing programs are likely to work better for low- and moderate-income customers than others. If your income is too high to qualify for Solar for All, consider the following financing questions when deciding to go solar. Things to consider are:

■ Is the financing arrangement cash-flow-positive from the start?

- With some kinds of financing, you come out ahead financially right from the start. With others, you have to pay more early in the contract period and don't come out ahead financially until years have passed.

■ Will you be able to take advantage of the federal ITC?

- If you can't take advantage of the ITC, you may be better off signing a lease or PPA than owning the system outright.

With a third-party ownership arrangement, a homeowner will not be able to take advantage of federal and state incentives.



■ **Are customer savings guaranteed?**

- In most cases, there's some financial risk involved in going solar. If something unexpected happens, such as a change in net metering rules or retail electricity prices not rising as quickly as expected, then going solar can actually cost you money.

■ **Will you be penalized if you don't have an internet connection?**

- Some contracts require customers to maintain a standard internet connection and charge you an extra fee if there is no internet connection, which might happen if you were late paying your internet bill.

■ **Is a person with a low credit score eligible for financing?**

- If you have a low credit score, you may or may not be able to find a financing program that you are eligible for. If you do find one, it may have higher interest rates or higher escalation rates than other financing programs. Community solar may be a better option to save money with solar energy.

■ **Is the contract available in small enough increments for a household with low electric use?**

- It is harder for solar companies to make money if their customers don't use much electricity.

■ **Will you be able to make the scheduled payments?**

- Missed payments can affect your credit score and cause complications in your life. Don't sign a contract unless you're sure you will be able to make the payments.

■ **Will you save money every month of the year?**

- Your panels will generate more electricity in the spring and summer, when the sun is high in the sky, than in the fall and winter. This means that the amount of net metering credits you receive will also be different at different times of year. If you have a contract, such as a lease, with fixed monthly payments, you may lose money in some months even if you gain money overall over the course of a year.

The DC Green Bank may offer more favorable rates, or other assistance, for income-qualified customers.

Some financing arrangements are cash-flow positive from the start, and others are not.

Weighing the Benefits of Direct Ownership versus Third-Party Financing

- **Cash flow:** A direct, upfront, cash purchase of a solar system is typically the least expensive option in terms of total dollars spent, because there are no interest costs or finance fees. In many cases, however, a homeowner will not have the cash available to pay for a system outright. And even when a homeowner does have enough cash, it still may be beneficial to finance the solar system and invest the cash elsewhere.

Remember that some financing arrangements are cash-flow positive from the start, and others are not. Depending on your personal circumstances, it may be particularly important to you to make sure your solar PV system will save you money from the start.

It is important to note that with a lease, PPA, or loan, you will have an additional monthly bill to pay beyond your regular monthly electric utility bill; however, that bill should be greatly reduced.

- **Incentives:** As noted above, with a third-party ownership arrangement (i.e., a lease or PPA), a customer cannot take advantage of federal incentives such as the ITC and District incentives such as SRECs. However, the fact that the third-party company will receive these valuable incentive credits should allow them to offer more favorable financing arrangements to the customer. On the other hand, customers who own the system may be able to receive these incentives directly.
- **Maintenance and risk:** Community solar subscribers usually have no maintenance responsibilities, regardless of how their subscription is financed. A homeowner financing rooftop solar through a lease or PPA generally will have fewer concerns about system maintenance and operation than a homeowner who purchases a rooftop system. Maintenance, monitoring, insurance, and warranties are usually provided under a lease or PPA. For example, replacement of most system parts that maintain a solar system's performance will be covered by the third-party developer under a lease or PPA. Some homeowners may feel more comfortable knowing that they do not bear these maintenance and operation responsibilities. Others may prefer to control and manage a system sited on their property.



Solar systems
generally require little
maintenance.

Solar systems generally require little maintenance. They should be inspected periodically and may need to be cleaned for best performance. If there is a snowstorm, panels generally shed snow on their own (and often faster than the rest of the roof) so clearing snow from them is usually not required. Other maintenance issues that can occur over the lifetime of a system may include loose wiring connections, wire damage from critters like squirrels, the need to replace an inverter, or breaking or cracking of the panels.

When a homeowner directly owns a rooftop solar PV system, either through an upfront cash purchase or a loan, and the system is not covered under any other insurance policy or covered under a warranty, the homeowner will bear the risk of system malfunctions, accidents, or anything else that makes the panels produce less electricity or stop producing electricity altogether. Under a solar lease or PPA, these risks are borne by the third-party owner rather than the homeowner.

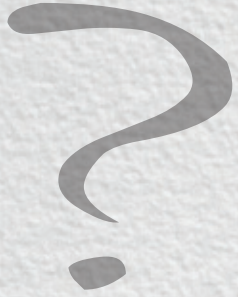
- **Limitations on what you can do with your property:** When a homeowner has a solar lease or PPA for a rooftop solar system, the contract may limit the homeowner's ability to alter the property if doing so would negatively impact solar access or solar system performance. For example, construction of a chimney could pose a problem if it would cast a shadow on the solar system. When homeowners directly own a solar system, they are not bound by a third-party owner's restrictions (though you would probably not want to put up a chimney where it would cast a shadow on your panels).

Table 1 (page 19) summarizes the similarities and differences between the different arrangements.



Table 1. Comparing Solar Leases, Solar PPAs, and Solar Loans/Direct Purchases

	Solar Leases	Solar PPAs	Solar Loans/Direct Purchase
Who buys the system?	Third-party owner	Third-party owner	Homeowner
Who owns the system?	Third-party owner	Third-party owner	Homeowner
Who receives the value of SRECs and the federal ITC?	Third-party owner	Third-party owner	Homeowner (unless SRECs signed over as part of financing)
Who is responsible for operations and maintenance of the system?	Usually the third-party owner	Usually the third-party owner	Usually the homeowner, though some loan products may include extended service plans
Who incurs the risk of damage or destruction?	Third-party owner	Third-party owner	Homeowner
What happens if the homeowner sells the home where the system is located?	Depends on the contract	Depends on the contract	If the homeowner finances the system through a loan, the homeowner remains responsible for loan payments after the transfer unless negotiated with the buyer
Are financing payments fixed?	Yes, the payments are pre-set but may include an annual escalator, increasing payments each year	No, the payments to the third-party developer/owner are on a per-kWh basis and depend on how much electricity is generated by the solar array Per-kWh prices may include an annual escalator	With a loan, the payments may be fixed or may vary over time
What contract duration terms are available?	Terms can vary but are often in the range of 20 to 25 years	Terms can vary but often in the range of 20 to 25 years	If the homeowner finances the system through a loan, the loan terms can vary
Do contracts provide minimum production guarantees?	Sometimes; check your contract	Sometimes; check your contract	A loan contract does not usually include production guarantees; however, a solar panel manufacturer or developer/installer may provide a production guarantee
Are there escalator clauses in the contracts?	Sometimes; therefore, check the contract for specific terms	Sometimes; therefore, check the contract for specific terms	If the homeowner finances the system through a loan, interest rates may increase over time depending upon the specific terms of the loan
Is insurance coverage provided?	Yes, usually	Yes, usually	No, homeowners who directly own their solar system and want to be covered will need to find coverage either through a homeowner's existing insurance policy or through the purchase of a new or expanded policy



notes

questions to ask

As you decide whether to purchase or finance solar panels, below are some questions to ask yourself and the companies you are interviewing. Good luck in your decision-making. Going solar is an exciting option that can give you many years of satisfaction.

Questions Related to Making the Decision to Get Rooftop Solar

- Have you received quotes from at least three different solar companies?
- Will the solar developer install the system directly, or will that be done by a sub-contracted installer?
- How long has the solar developer/installer been in business? What is the solar installer/developer's reputation and financial standing? Do you know anyone who has used the solar developer/installer before? Have you received references?
- Does the solar company have the proper District licenses, including a home improvement salesperson license and a home improvement contractor license? How much work have they done in the District? How much work have they done on your particular roof type (especially flat roofs, which can be more challenging to design)?
- Will you be able to monitor the electrical production of your system after it's installed?
- How much of your electrical needs at home will be covered by the electricity produced by your system?

Questions Related to Making the Decision to Subscribe to Community Solar

- Has the system you will be subscribing to already been built, or is it in the planning stages? When will it be built? What happens if it never gets built?
- What is the solar company's reputation and financial standing? Have you received references?
- Will you be allowed to cancel your subscription if you want to? Will there be penalties if you do?
- Do you think you might move out of the District before the end of your subscription? What does your contract say will happen if you do?

Questions Related to Financing

- Has the solar developer calculated the estimated financial benefits you will receive over the life of the contract? Do these calculations assume you will be eligible for the federal ITC?
- Has the solar developer walked you through the contract?
- Given your personal tax situation, does it make sense to own the system (through a loan or direct purchase) in order to take advantage of the federal ITC?
- If you are signing a loan, what is the interest rate?
- If you are signing a lease or PPA, is there an escalation clause? If so, what is the annual escalation rate?
- What is the duration of the financing agreement?
- Have you shopped around to compare other financing packages?
- Do you have to make a down payment?
- Do you have the option to make a down payment to reduce monthly fixed payments (lease or loan) or kWh rate (PPA)?
- Is there a pre-payment option where you can make some or all of your payments early?
- Will your monthly payments be equal to or less than the savings on your electric bill? (You'll want to factor in how much of your electricity needs will be met by your solar PV system as that will affect the reduction of your electric bill.)
- If you are signing a PPA, is the electricity rate you are being offered lower than what you are currently paying?
- If you are financing your system through a lease or PPA, what happens at the end of the contract term? Does the contract require you to buy the system at the end of the contract term? If so, how is the buyout amount determined?
- Can you buy out your financing contract? When and under what circumstances?
- What happens if you sell your home before the end of the solar contract term? For instance, what happens if the buyer does not qualify to assume your solar lease or PPA? What if the buyer does not want the solar system included in the property sale?
- If you are financing your system through a lease or PPA, what happens if you need to replace the roof during the contract term?
- Could the system be removed or repossessed if the company goes out of business or gets into financial trouble?
- Could the company sell the contract to a new entity? Will you be notified if that happens?

Questions Related to the Operation of the Solar PV System

- Who will perform operations and maintenance on the system? If it's the third-party owner, who specifically do you contact if there is a problem? Are you required to notify someone about problems within a certain timeframe? How quickly will that person respond to your request for help? Will there be charges for parts and labor? What operations and maintenance services does your contract cover?
- Does the contract contain minimum production guarantees? If so, what compensation is provided in case of a production shortfall? Will shortfall compensation be based on a wholesale or retail per-kWh price?
- What are the insurance requirements? Who insures the system? Is there a minimum insurance coverage requirement for the house in order to install a solar system? What will your current home insurance policy cover with respect to your solar system?
- Do you have to pay for any damage? Are there damage reporting requirements?
- Who is responsible for warranting the system? If there is a warranty, is it with you or the solar company? Will you receive a copy of the warranty agreement?



Solar resources

Solar Financing Resources

- [Rooftop Solar Financing 101](#) (video) and [Will Solar Panels Save You Money?](#) (video)
These two short videos were produced by the George Washington University Solar Institute for the Clean Energy States Alliance (CESA). The first video, “Rooftop Solar Financing,” introduces solar loans, leases, and PPAs and briefly explains some of their advantages and disadvantages. The second video, “Will Solar Panels Save You Money?,” discusses key questions homeowners should explore when deciding whether going solar makes financial sense, including how the cost of solar compares to savings from solar, how the federal ITC works, and the extent to which a homeowner’s electricity bill can be offset by solar.
- [Financing Your Solar System, Energy Sage](#)
EnergySage, an online marketplace that provides price quotes from multiple PV installers, has a webpage dedicated to solar financing that provides information to help homeowners navigate their financing options.
- [The Homeowner’s Guide to Solar Financing, Let’s Go Solar](#)
The Let’s Go Solar website has helpful information and infographics about solar financing options for consumers. The website is managed by an offshoot of a for-profit media group.
- [Selling Your Solar Home Guide](#)



DC Solar Resources

- [A DC Consumer's Guide to Going Solar](#)
- [DOEE solar information page](#)
- [DOEE Solar for All Program](#) provides the benefits of solar to low- and moderate-income households
- The [DC Solar Tool](#) shows District of Columbia residents, businesses, and property owners how much electricity can be produced on their rooftops from solar photovoltaic (PV) systems, how the financial investment will pay off, and how much pollution will be reduced. Users can also find hundreds of systems already installed throughout the city.
- DC Office of People's Counsel (OPC) [consumer assistance for problems with utilities](#)
- DC Office of Attorney General (OAG) [consumer assistance for complaints about businesses](#), including solar installers
- DC Department of Consumer and Regulatory Affairs (DCRA) for [information about permitting](#).



endnotes

- 1 See [average monthly residential electricity use in DC](#).
- 2 Among other things, the full cost of an installation may vary depending on system size, PV module and inverter type and brand, equipment options (for example, solar tracker panels, microinverters), the age and quality of the existing roof or the need to install a ground or pole-mounted system, available incentives, labor costs, permitting fees, participation in a bulk purchasing program, etc.
- 3 See more information about [solar PV pricing trends over time](#).
- 4 [EIA Electricity Data Browser](#).
- 5 Learn more about [U.S. inflation](#).
- 6 A similar solar tax credit for businesses will step down on the same schedule, except that in 2022 it will permanently revert to 10 percent rather than sunset entirely. Companies providing leases and PPAs to residential solar customers may be eligible for the business tax credit and may be able to pass along the financial savings to their customers.
- 7 There are a number of options for selling your credits. Selling upfront all the credits that your system will generate over a given time period (usually 5 to 15 years) can provide cash to help pay for the system. Selling them periodically under a shorter contract period at an agreed upon fixed price (sometimes called an annuity plan) can lock in more value. Choosing to keep the credits and sell them one at a time (brokerage or “spot sales”) can produce the most value but comes with the most risk as SREC prices fluctuate with market supply and demand.



DISTRICT SOLAR CONSUMER FINANCING GUIDE

Department of Energy & Environment (DOEE)

DOEE is the District of Columbia's resource for energy efficiency and renewable energy programs, products and services. DOEE develops energy-related policies and plans, and coordinates and facilitates the overall effort of the District Government to achieve reliable, clean and affordable energy. Learn more at doee.dc.gov/energy.

Clean Energy DC

Clean Energy DC is the District of Columbia's energy and climate action plan. It explains how the District will use forward-looking energy policies, while also encouraging innovation, efficiency, and resiliency. Clean Energy DC re-imagines what a 21st century energy system could be but is also pragmatic and focused on achieving tangible goals. Learn more at doee.dc.gov/cleanenergydc.

