

## 2.4

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### Third-Party Residential Financing Models

Several models for financing solar energy systems and reducing their up-front costs have evolved in the marketplace. Municipalities can pave the way for private sector solar companies to thrive in their communities or partner directly with the private sector to offer residents financing options. Two popular new models for consumers interested in purchasing solar for their homes are residential solar leasing and residential **power purchase agreements** (PPAs). These new models complement the more conventional use of cash or home equity loan financing for solar installations.

Under third-party financing mechanisms, the homeowner does not purchase the **photovoltaic** (PV) system but enters into an arrangement with a company to make periodic lease payments or electricity payments for the system. These third-party financing mechanisms can be attractive for homeowners because they can reduce the risk and complexity involved in owning and operating a PV system. And PV systems owned and operated by third-party providers often perform better because the providers frequently monitor their electricity output and experts perform any necessary maintenance or repair.

The concept of residential solar leasing is fairly straightforward. Instead of purchasing a PV system, homeowners enter into a contract with the owner of a PV system who will install the system on the homeowner's roof. The homeowner puts little or no money down and agrees to make monthly lease payments during a set period of time (typically 10 to 20 years) while consuming electricity from the PV system. Typically the combined lease payment and monthly utility bill (which pays for power needed when the sun isn't shining) is competitive with and sometimes lower than previous electric bills. Meanwhile, the party owning the system (i.e., a solar company) benefits from the tax credits and accelerated depreciation of the solar equipment as well as any available rebates.

At the end of a lease period, the homeowner may have the opportunity to purchase the system. If the homeowner isn't interested in purchasing the system, it can be removed or the lease can be extended. If the home is sold, it may be possible for the existing homeowner to transfer the lease to the new homeowner. Residential solar leases can be an attractive feature for homeowners who want to benefit from solar power but don't want to incur the up-front costs of purchasing a system or the ongoing maintenance costs of owning their own systems.

Under a residential PPA, a third party (usually a solar company or its investors) owns and operates a PV system located on the homeowner's roof. The homeowner enters into a contract with this third party to buy all of the electricity that the PV system generates over an extended period of time, typically up to 20 years. The third party, as the owner of the system, is

responsible for all operations and maintenance of the PV system. The third party will take the available tax incentives and local rebates and use them to lower the cost of electricity to benefit the homeowner. The homeowner will continue to purchase some electricity from the utility to complement the electricity produced by the PV system.

The primary difference between a solar lease and a residential PPA comes down to making a monthly lease payment to a third party in a solar lease versus purchasing electricity under a PPA. In most markets, the consumer will have the option of either a solar lease or a residential PPA, but not both. This is due to a number of factors including whether or not the PPA is permissible by law and how electricity sales are taxed vis-à-vis leases. For consumers in a market where both the PPA and the lease are available, there are a number of factors to compare, including the following:

- The up-front cost of each option
- The rate at which either the lease payment or the PPA price increases each year (rate of escalation)
- Whether maintenance is included in the lease or PPA price
- Whether online system monitoring is included
- The costs associated with terminating the lease or the PPA at the end of the term.

As of September 2010, residential third-party financing, either through a solar lease or a solar PPA, is available in the following states: Arizona, California, Colorado, Connecticut, Hawaii, Massachusetts, Minnesota, New Jersey, Oregon, Pennsylvania, and Texas.

## BENEFITS

Paving the way for private sector financing or directly partnering with the private sector to offer financing options will benefit the community by reducing the primary barrier to PV deployment: high up-front cost. The advantages of residential PPAs and leases include low-upfront costs; predictable and competitively priced electricity costs in the future; no ongoing maintenance obligations; and a variety of options at the end of the PPA or lease, such as purchasing the system, having it removed, or extending the term of the contract.

## Implementation Tips and Options

- Local governments can create a solar-friendly environment that allows for private sector solar financing models to thrive. Streamlined permitting processes and reasonable permitting fees, property and/or sales tax waivers or discounts, and solar access laws help facilitate private sector financing models.
- Partner with companies offering solar financing to help market the option to residents. Many residents are unaware that solar financing options exist, and given that many homeowners perceive solar as a new technology, they will be more likely to participate in a solar financing program if the local government has endorsed it.
- For homeowners interested in owning a solar system as opposed to having a third party operate a system on their roof, consider creating a PACE program (see [2.5, Property Assessed Clean Energy Financing Program](#)).

- Work with the state or public utility commission to ensure that residential leases and PPAs are allowed in the state.
- Develop a community solar financing program for residents whose roofs aren't suitable for solar energy systems (see 2.8, [Community Solar](#)).

## Examples

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### **Phoenix, Arizona:** Forming a Partnership between the City of Phoenix and SolarCity

Solar Phoenix is a collaborative effort among the city of Phoenix, the solar leasing company SolarCity, Arizona Public Service, and the National Bank of Arizona. The city is supporting the program by providing certain protections against homeowner defaults via its Industrial Development Authority. Program participants can install a solar system with no up-front cost and a low monthly lease payment. The new lease payment plus the new lower electricity bill is typically lower than the utility bill homeowners paid before they installed a PV system, saving the average Phoenix homeowner 15% on monthly electricity costs. Participants must be in good financial standing and have a minimum FICO score of 700 to be eligible for Solar Phoenix's financing. Visit [www.solarphoenix.org](http://www.solarphoenix.org) for more information.

Visit [www.solaramericacommunities.energy.gov](http://www.solaramericacommunities.energy.gov) for more inspiring examples from communities across the United States.



## Additional References and Resources

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### PUBLICATIONS

#### ***Homeowners Guide to Financing a Grid-Connected Solar Electric System***

National Renewable Energy Laboratory, October 2010

This guide explains multiple financing options available to homeowners considering the installation of a PV system. The report includes short descriptions and a table comparison of financing a PV system through a cash purchase, home equity loan, solar lease, residential PPA, and a PACE financing program.

Publication: [www.eere.energy.gov/solar/pdfs/48969.pdf](http://www.eere.energy.gov/solar/pdfs/48969.pdf)

#### ***Solar Leasing for Residential Photovoltaic Systems***

National Renewable Energy Laboratory, Revised April 2009

This fact sheet provides an overview of the residential solar lease and compares it to a cash purchase and system financed through a home equity loan.

Fact sheet: [www.nrel.gov/docs/fy09osti/43572.pdf](http://www.nrel.gov/docs/fy09osti/43572.pdf)

### ***Solar Photovoltaic Financing: Residential Sector Deployment***

National Renewable Energy Laboratory, March 2009

This report presents the information that homeowners and policy makers need to facilitate PV financing at the residential level. It covers the full range of cash payments, bill savings, tax incentives, and potentially available solar attribute payments. Traditional financing is compared with innovative solutions, many of which are borrowed from the commercial sector. By calling attention to these innovative initiatives, this report aims to help policy makers consider greater adoption of these models to benefit homeowners interested in installing a residential PV system.

Report: [www.nrel.gov/docs/fy09osti/44853.pdf](http://www.nrel.gov/docs/fy09osti/44853.pdf)

### ***Solar Leasing for Residential Photovoltaic Systems***

National Renewable Energy Laboratory, February 2009

This publication examines the solar lease option for residential PV systems and describes two existing solar lease programs, and helps homeowners revisit the comparison between the solar lease and home-equity financing.

Publication: [www.nrel.gov/docs/fy09osti/43572.pdf](http://www.nrel.gov/docs/fy09osti/43572.pdf)



The Denver International Airport (DIA) features a 2 MW PV system. DIA is now host to a second 1.6 MW array system. (Denver International Airport/PIX18043)