

# Deerfield Homeowner's Guide to Solar Electricity

Deerfield Energy Resources Committee  
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## Why change to solar electricity?

### Financial

Purchasing solar panels for your home pays for itself in 5 – 8 years. After that you get virtually free electricity for the life of the system (at least 25 years total).

### Environmental

Converting to solar electricity produces by far the biggest reduction in “carbon footprint” available to a household. For example, it was estimated that a recent home solar proposal presented to one of our committee members would avoid 5.8 tons per year of carbon emissions. (The average US citizen is responsible for about [22 tons](#) of carbon emissions per year, compared to a world average of 4 tons per person.)

## How does it work?

The [Massachusetts Clean Energy Center](#) site includes a good basic explanation solar electric systems.

## How much does it cost?

Although the total cost of a system is high (\$20 – 50,000, average \$30,000), this is offset by elimination of electric bills and by the financial incentives described below. With these benefits, the final system cost can be reduced by more than 50%. If it is financed with available low-interest loans, the system can be “cash-flow neutral” starting in the first or second year. (In other words, the savings on your electric bill equal the payments on your loan.)

## **What is the long-term financial picture?**

After a 5 – 8 year break-even period, when the amount you have paid for the system equals what you have saved on your electric bill, you begin to make money. The amount varies depending on how the system is financed. For example, in the proposal recently accepted by our committee member, there would be an estimated net gain of about \$40,000 after 20 years. (This was a proposal that did not involve a loan).

## **Will solar panels affect my property value or taxes?**

### **Property value**

In 2015, Lawrence Berkeley National Lab and the U.S. Department of Energy released a detailed analysis of 20,000 home sales in multiple states. The conclusion: an average sized solar electric system that is owned by the seller adds \$15,000 – \$20,000 to the resale value. See the full report [here](#), or this brief [summary](#). If a home is sold, contracts and warranties for systems that are directly owned by the homeowner are generally fully transferrable.

### **Will my property taxes increase?**

Solar energy systems are [exempt from local property tax](#) for 20 years by Massachusetts law.

## **What financing and incentives are available?**

Both the State and Federal governments have supported the development of “green energy” through a variety of programs.

The Mass Department of Energy Resources (DOER) produced an excellent [homeowners guide to solar financing](#) in 2015. The incentive programs are complicated and change frequently; you can get the most current information from the company that sells and installs your system.

**Tax Credits** (the amount of a tax credit is deducted from your tax bill]

[Federal income tax credit](#): 30% of the cost of the system. This applies to the first year of the system, but can be rolled over into subsequent years if your tax bill is less than the credit.

[Mass tax credit](#): \$1000

## **Mass Solar Loan Program**

As a state incentive for green energy, the loans are partially subsidized, resulting in fixed rate loans at lower interest rates than commercially available. For income-qualified residents, there is further loan support. The program's [website](#) gives more detail.

## **SRECs**

As another way of supporting solar energy development, Massachusetts has created the "Solar Energy Renewable Certificate" (SREC) program. SRECs are produced by home solar systems based on the amount of energy generated. SRECs are bundled by "aggregators" and sold to electric companies. SRECs provide payments to the owner of a home solar electric system each year for 10 years. The solar installer will refer you to an aggregator who will then set up the details for your SREC program. In the system proposed to our member recently, for example, the estimated SREC revenue was \$19,000 total over 10 years. The Hampshire Council of Governments is a regional non-profit aggregator recommended by many local solar companies. Their [site](#) gives further detail.

**The current SREC II program will expire on March 31, 2018. (To qualify, your system must be functioning by then.) A new program, "SMART", will replace it. The legislature is now finalizing the details of SMART, but it is expected to provide only about 50% - 70% of current SREC II benefits.**

## Is there a rush to decide? YES

**To obtain the current SREC II payback, systems must be in operation by March 31, 2018.**

**It now takes about 3 months from signing a contract to hook-up and operation of a new system. As more people learn of the SREC II expiration deadline, this lag time will very likely increase. So if you are interested in direct ownership, you should start interviewing installers now and sign a contract within the next few months.**

## What are the alternatives to direct ownership?

### Solar Leases and PPAs

Arrangements can be made with some solar companies for 3<sup>rd</sup> party ownership of a system. The [DOER guide](#) (p. 5) gives a summary of the two options, leasing or PPAs (Power Purchasing Agreements). With both options, the company owns the system, and you get a contracted monthly payment that should be slightly lower than the electric utility bill you're avoiding

### Pros and Cons of Leases and PPAs:

#### Pro

1. The homeowner has little or no upfront cost.
2. Because the 3<sup>rd</sup> party owns the system, they are responsible for maintenance. (Maintenance costs are low, however, and most components have a 25-year warranty.)
3. All financial arrangements have the same environmental benefit

## Con

1. The 3rd party gets the tax credits and SREC income. (This is why many companies heavily promote lease and PPA arrangements.) The overall financial advantage of direct ownership over leasing or PPAs is very significant. The DOER published a detailed [report](#) on this issue in 2013. (The numbers are out of date, but the conclusions are valid.)
2. Transferring systems when a house is sold may be difficult with 3rd party ownership, not with direct ownership. If you are considering a lease or PPA, it is very important to read the contract carefully and understand these issues.

## Can any home have solar panels?

A rooftop has to have enough sun exposure (adequate orientation and lack of shading). However, modern panels are very efficient, so your rooftop does not have to be perfectly south facing. The more optimal your site, the lower the cost. Your installer will do a detailed analysis of your site to determine if rooftop solar panels will work, and will design and discuss possible systems with you. Depending on your site, ground-mounted panels may be another option.

Again using the example of our committee member's recent experience, his system will be placed on a large, unshaded roof that faces east. Despite this orientation, it is projected to supply 100% of his current electricity usage, but requires more panels and thus is at the higher end of the cost range. In practical terms, though, the payback period of this system will be about 8 years, as opposed to 5 for a typical south-facing roof.

## How do I do it?

There are many regional, statewide and national companies that will sell you systems. Some are mainly interested in leasing and PPA arrangements, some work with direct ownership only, some both. We prefer working with local companies both because of their accountability and as a way of keeping money in the local economy as much as possible. And, as discussed above, we recommend direct ownership because of its financial advantages for you.

There are a number of excellent local companies that provide direct ownership systems. Some examples include, in alphabetical order, [Northeast Solar](#), [PV Squared](#), the [Solar Store of Greenfield](#) and [Valley Solar](#). We recommend obtaining proposals from several different companies for comparison. In this process you will get up-to-date information about all the issues discussed above and about the current equipment available, which evolves continually. You will then be ready to make an informed choice of the system that is best for your needs.