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FAQ SOLARIZE ANDOVER

If the information presented here does not answer all your current questions, please visit the Solarize Andover (<http://www.solarizeandover.com/>) website, the MassCEC website, or send the question via email to SolarizeAndover@gmail.com. It is our goal to respond to emails within 24 hours.

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SOLARIZE ANDOVER FAQ

THE SOLARIZE MASSACHUSETTS PROGRAM

What is Solarize Mass?

Solarize Mass is a program which seeks to increase the adoption of small-scale solar electricity in participating communities through a competitive tiered pricing structure that increases the savings for everyone as more home and business owners sign contracts. Now in its third year, Solarize Mass, a partnership between the Massachusetts Clean Energy Center (MassCEC), the Green Community Division of the Massachusetts Department of Energy Resources (DOER) and cities and towns across the commonwealth, has led to more than 1500 residents and business owners signing contracts for small-scale solar electricity systems, and has spoken with thousands more about the economic and environmental benefits of solar electricity, energy efficiency and other clean energy technologies.

What is Solarize Andover?

Solarize Andover is the volunteer marketing and information outreach program which will introduce the Solarize Mass program to the residents of Andover.

Why should I participate in Solarize Andover now?

The Solarize Andover program will offer significant savings over current market prices for solar PV installations done through the designated installer. The installer has been vetted by a team of community volunteers who have examined the prices charged, equipment used, contracts offered, and reputation earned. The installer will be able to benefit from a large number of contracts in the same geographical area, marketing help from community volunteers, and the ability to bulk purchase the installation components. The installer passes along savings to Andover residents through the competitive tier pricing structure offered as a condition for selection. The Solarize Andover



program is designed by MassCEC to be time-limited. Contracts to install must be signed by June 30, 2014 to be eligible for the pricing structure offered.

SOLAR PV ENERGY

What is solar PV energy?

Solar electric systems are commonly referred to as photovoltaic systems, PV for short. PV cells are able to convert the light energy from the sun into electricity. This electricity can be used to power appliances in your home reducing your need for electricity from the utility or it can be sent back into the electric grid earning you a credit for your production that lowers your future electric bill. PV cells are made of slices of silicon crystal placed under a thin sheet of glass. Small wires on the silicon route free electrons from the illuminated silicon into a completed direct current (DC) circuit. An inverter in the circuit converts the direct current into usable alternating current (AC). If the total power generated from the PV system is not used directly and immediately by the household, it flows backward into the electrical supplier's grid, through a special electric meter able to run backwards. This process is called net metering. At night when the PV panels are dark, power from your electric utility flows into the household in the normal way, spinning the meter forward. Solar PV electricity is generated on a cloudy day, but at a lower rate.

Is my house a good candidate for a solar PV installation?

There are many factors to consider when asking this question. A south facing roof is best, but east and west facing roofs can provide good results. Dense shade can dramatically reduce the performance of your PV array. Of course, larger PV arrays can produce greater output, so the square footage of your rooftop may be a limiting factor as well. One consideration that may factor into your decision to install panels on



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your roof is the current age of the roof. Your installer will be able to discuss this issue with you at the time of his assessment. If you are not sure if your roof will work, contact the Solarize Andover designated installer for a free, no-obligation assessment.

If my house is not a good candidate for a roof mounted PV, are there other options?

A PV system mounted on poles in the yard is a good alternative to a roof mounted system. The pole mounted array will cost more than a roof mounted one, but it may produce more power, because its orientation can be changed throughout the year to optimize its orientation to the sun.

Why is the decision to install solar PV time critical?

Installing solar PV systems for your home or business has never been more cost effective than it is today. There are currently valuable incentives to install these systems. There is a 30% Federal tax credit on the installed cost. The Commonwealth of Massachusetts adds a 15% state tax credit up to a maximum of \$1000 and a cash rebate that is determined by the system size and site quality but is usually worth around \$2,000. In addition, every 1000 kilowatt hours of solar electricity generated becomes an SREC, which can be sold in a special market formed to trade in these credits. How long these incentives will be available is uncertain. For instance, the Federal tax credit is set to expire in 2016, pending further action by Congress. Further benefits include exemption from state sales tax for the cost of the equipment installed, and a 20 year exemption from increased property taxes on the system. All of these benefits are legislative creations, and may be altered by the legislature in the future. The Solarize Andover program will create tiered discounts for all systems registered and installed under the program, reaching as much as 20% off the standard price. The Solarize Andover program will end on 30 June 2014.



Are my chances for a cheaper tier price increased if I wait to the end of the program?

As each successive tier is reached, all the previously contracted owners benefit. There is no advantage to delay contracting with the installer.

What is an SREC?

A Solar Renewable Energy Credit (SREC) is 1000 kilowatt hours of power recorded by a utility-grade electric meter wired into the circuit before the electricity is either consumed by the household, or sent into the grid of the electric utility. Every kilowatt hour generated by your system is recorded and reported to the Massachusetts Clean Energy Center. You get credit for every kilowatt hour, even though you may consume some, or all, of it.

How do I sell my SRECs?

Since it is very costly for electric suppliers to buy directly from individuals, solar owners will generally work with third party aggregators who establish a public marketplace connecting sellers directly to suppliers in an inexpensive, easy, transparent and equitable way. The aggregators are able to accommodate volume transactions with buyers and provide auction services for individual sellers in the market. In addition to this, Massachusetts has implemented the MA Solar Credit Clearinghouse as a last resort, fixed-price auction in the last quarter of each year with a fixed price of \$300 per SREC less a 5% fee assessed by the auction administrator. This fixed price auction acts as a price floor mechanism with the goal of creating a sustainable SREC market. However, this is not a concrete price floor as buyers are not required to buy all of the SRECs that are put into the auction. Astrum Solar, the designated installer for Solarize Andover, is one of the East Coast's largest SREC aggregators and has numerous in-house options to monetize your SRECs including no-fee or commission brokerage contracts.



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How do I get the benefit of electricity my solar array generates?

First, all the electricity generated by your system and consumed by your household is free of utility cost. The SRECs you produce can be sold through a specialized broker who deals in the SREC commodity. Solarize Andover’s designated installer will sell your SRECs and give you the full value. The SREC auctions happen quarterly, and the actual price paid can vary. SRECS are important because they represent a significant cost reduction to the investment in a solar PV system over time. Coupled with tax incentives and any cost savings on electricity from your system, most solar PV systems will pay for themselves in 5 to 8 years, depending upon site quality. If the amount of power you generate exceeds your household use in any month, through a process of “net metering”, the excess is carried as a credit by the power company until used by you in a future month.

Why should I be interested in a solar PV installation?

Solar power represents an investment in your home and future. Purchasing a solar system can have rates of return higher than 8%. Solar also protects families from electric rate increases by locking in at least a portion of their electric costs. After an initial investment, the production of household power is predictable, and its low long term price dependable.

Solar power is quiet and reliable. Those who choose an investment in solar power are making a personal commitment to reducing their impact on the earth’s ecosphere. Every bit helps.

In addition, financial incentives are in place to lower the cost burden of the initial investment. The current incentives are Federal and state tax rebates, and the sale of SRECs. While the extent of profit will depend upon the cost of electricity in the future, solar components have warranted lives of up to 25 years. Current projections show significant increases in electricity cost decade



over decade, meaning most solar arrays will have many years of profit making production.

How long will a typical PV installation take?

The length of a solar installation depends upon the size of your PV system and its complexity. The on-site installation time for most residential jobs is usually only two days. The start time of the install will depend on the amount of time it takes to pull permits and get approval to install from the utility. Once installed, the project must be inspected by Andover and approved by the utility again. This process can also take weeks. From time of contract to powering up the system can be months.

Where can I get a consumer viewpoint on existing Andover installations?

Several residents of Andover of the 50 or more households who have already installed solar PV arrays have volunteered to answer questions about their experience. Contact us (SolarizeAndover@gmail.com) for more details.

COSTS TO INSTALL SOLAR PV

Which company will be the preferred installer for Andover Projects?

Part of the process in Solarize Andover is the task of the town, through its volunteers, to select a single preferred installer. The installer agrees to provide tiered discounts depending upon the total number of contracts for solar PV installations executed between residents and the installer. Being the preferred installer allows economies of scale in supply purchasing agreements, savings in customer acquisition, and the value of volunteer marketing and outreach to be passed on to residents who participate. No Andover resident is obligated to use the preferred installer. Any resident can negotiate his own distinct contract with any solar PV installer, including the preferred one. However, a contract with a preferred installer is likely to be a more favorable one for Andover



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residents. Astrum Solar has been chosen as Andover's designated installer.

How much will a small solar PV array cost?

An average size 5kW system will cost \$13k to \$20k. This size system will generate half of the electricity used in most homes.

Is a solar PV installation difficult to permit and build in Andover?

Andover has considerable experience with over 50 solar installations to date. The designated installer is also providing a turn-key service which includes managing the permit process. The Solarize Andover Program will attempt to further streamline the permitting and inspection process, to provide a shortened timeframe with greater certainty in requirements and costs to the designated installer. Those savings, like the others, can be reflected in greater discounts to Andover residents.

How much do I need initially to pay for the installation of a solar PV system?

Like any other construction project, the installer will expect payment upon completion. It is also possible to go solar without putting any money down through solar leasing. Despite the financing method, immediate paybacks will start with electricity bill savings. Approximately five months after the PV system comes online, the SREC revenue stream will start. April 15 of the year following completion will capture the 30% Federal tax credit, and the 15% Massachusetts tax credit (max \$1000). The SREC stream of payments will last for ten years after installation. Funding of the investment in a solar PV system is best done with savings, or home equity loans. Some banks may offer their best customers an unsecured loan. Astrum Solar will have more detailed information on financing of an ownership or leasing value proposition.



Are there other options besides ownership of the solar PV equipment?

It is possible to install a solar system and save money on your electric bill through solar leasing. With leasing, a third-party finance company owns the system, and you pay them based on a preset payment schedule, usually lasting 20 years. The amount of the lease payment reflects the ability of the leasing company to take advantage of the numerous financial incentives for installing solar, plus at least one not available to the residential owner. Leasing has the added advantage of having no up-front costs. During the term of the lease, the finance company is responsible for maintaining the system, and at the end of the lease, you are generally offered a continuation of the lease, the discounted purchase of the system, or a no-cost removal of the equipment.

Should I lease or own a solar PV array?

Different families will have different financial goals when adopting solar PV systems. Those goals will determine which model of acquisition best suits their immediate and long term needs. The two critical pivot points are cash flow, and likely tenure in the property on which the solar PV system will sit.

The terms of a lease are structured favorably for no out of pocket acquisition costs. Also, the risk of ownership of the PV equipment stays with the lessor. However, a price is paid to the lessor for his capital equipment and service. That price is a higher monthly cost over the life of a PV system, and a different model of financial return for solar investment.

If the time lived in the house is likely to be shorter than the usual 20 year lease, the lessee of the PV system is required to remove the equipment and pay the remaining lease payments, or agree to the transfer of the PV array and the remaining lease payments to the new owner. Of course, the new owner must be willing to take on the remaining lease payments, and must be financially qualified to do so. A more thorough explanation of this question can be found at <http://ow.ly/uX263>.



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Are there different solar economics for a business?

In addition to all the benefits available to a residential owner, a business may claim a five-year Modified Accelerated Cost Recovery System (MACRS). Although the system life is typically greater than 25 years, accelerated depreciation for a long system life dramatically increases the after-tax financial return of the solar project.

What is the expected lifetime and what warranties are offered on a solar PV array?

Solar panels have a 25 year warranty with an expected life of 25 to 30 years. The inverters used in Solarize Andover have a warranted life of 12 years with an option to increase it to 25 years. Over time, the efficiency of solar panels decreases by .25% to .50% per year. Astrum Solar’s workmanship warranty for purchased systems is 10 years.

POST INSTALLATION ISSUES AND PAYBACK

What payback is typical?

Payback on the solar investment can range from 4 to 8 years. This roughly translates to return on the installation cost of 10% to 21%. Following the payback period, the owner will continue to accrue the value of free electricity, and the remaining term of the SREC stream.

What other collateral benefits can I expect from a solar PV installation?

State law has declared a property tax holiday on the value of the installation for 20 years. Studies have shown that a solar PV array adds \$20,000 of value to your home for every \$1000 the system cuts from the annual electric bill. There is no Massachusetts sales tax levied on solar equipment or its installation. Despite the recent surplus of natural gas, electric rates are expected to increase over the next decade.

What happens during a power outage?

All solar PV systems are equipped with an interlock that shuts down the system during a power outage. Because most installations are tied to the electric grid, the interlock protects power company workers from electric shock when working on power lines during an outage. The only PV system which can be run during a power outage is one installed with battery backup and a transfer switch. Such systems are considerably more expensive than the grid tied system commonly installed.

What maintenance issues can I expect?

Maintenance issues with PV systems are almost non-existent. Rain cleans the surface of the panels, but an annual rinse with a hose is suggested when the panels are cool. During the winter, snow will accumulate on the panels. In cases of moderate snow, the panels will warm from light passing through the snow, and the panels will clear much sooner than other parts of the roof. There are no moving parts in a solar PV installation. The most likely component to require replacement is the inverter, and that should be only after more than a decade of use.



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