



# Solarize Hot Water Western Mass | Frequently Asked Questions

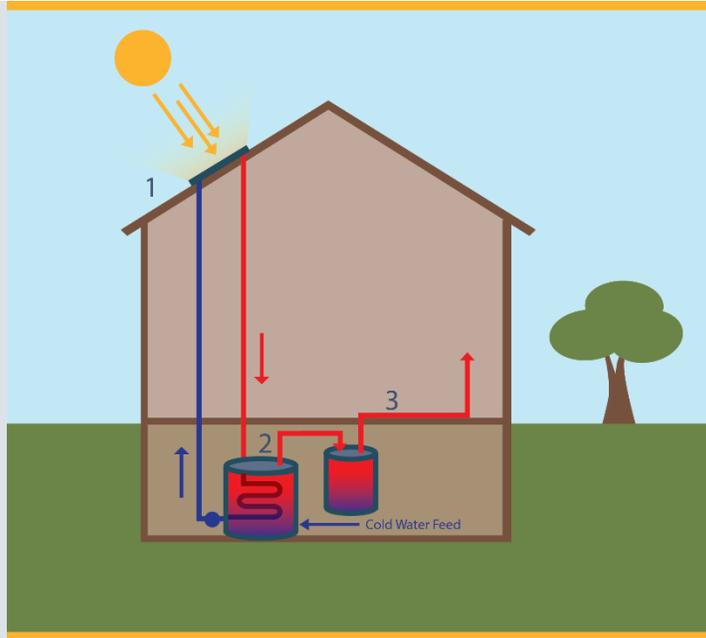
## About Solarize Hot Water Western Mass

Question	Answer
<p><b>What is Solarize Hot Water Western Mass?</b></p>	<p><b>Solarize Hot Water Western Mass</b> is a new regional initiative that aims to help homes and businesses in Western Massachusetts reduce their water heating bills and carbon footprints through installing solar hot water (SHW) systems. Supported by thousands of dollars in state and federal incentives, solar hot water systems are clean energy technologies that can eliminate up to 80% of the fossil fuels or electricity you use to heat your water, saving you hundreds of dollars a year in energy costs.</p> <p>Solarize Hot Water Western Mass will run from <b>March through end of June 2018</b>. Residents and businesses in western Mass will be able to work with a competitively selected local installer to receive a special limited-time discount on solar hot water systems.</p> <p>If you've heard of the "Solarize Mass" program—like Solarize Amherst, Solarize Northampton, and others around Western Mass—think about this as Solarize for solar hot water systems instead of solar photovoltaics.</p> <p>Led by the Hampshire Council of Governments (HCG) in partnership with the Towns of Amherst, Pelham, and Williamsburg, Solarize Hot Water Western Mass is the latest local program focused on making cost-saving renewable energy more affordable to western Mass residents and businesses.</p> <p>Solarize Hot Water Western Mass is supported by the Massachusetts Clean Energy Center's (MassCEC) Commonwealth Solar Hot Water Program.</p>
<p><b>How does Solarize Hot Water work?</b></p>	<p>Solarize Hot Water Western Mass is a simple way for home and business owners to purchase solar hot water systems at a discounted price from a qualified local installer.</p> <p>The Challenge process is simple and follows these easy steps:</p> <ul style="list-style-type: none"> <li>• Sign up to receive a no-cost, no commitment visit from <b>Spartan Solar</b></li> <li>• <b>Spartan Solar</b> will give you a call within two business days to ask you some additional questions and schedule a site visit at your convenience.</li> <li>• <b>Spartan Solar</b> will visit your home or business, determine whether a solar hot water system is right for your building, and discuss your options. Shortly after the completion of the visit, <b>Spartan Solar</b> will present you with a quote, and if you're ready to proceed Spartan Solar will secure your rebates and building permits and schedule your installation.</li> <li>• <b>Spartan Solar</b> will complete your installation and you'll be ready to heat with the sun!</li> </ul>

<p><b>How was the installer selected?</b></p>	<p>HCG issued a competitive request for proposals for solar hot water installers in December. With support from the Towns of Amherst, Pelham, and Williamsburg and other members of the selection committee, HCG evaluated these bids across several key areas, including experience working in Western Mass communities, customer service, technical ability, customer references, and price. The Challenge selection committee selected <b>Spartan Solar</b>, a local, Greenfield-based SHW installer, for their reputation for customer service and expert knowledge of the needs of homes across Western Mass.</p>
<p><b>Am I eligible to participate in this program?</b></p>	<p><b>All residents and businesses in Hampshire, Franklin, Hampden, and Berkshire counties are eligible to participate in Solarize Hot Water Western Mass.</b> Business owners from those counties are also eligible to participate, although depending on the size of system you need, you may need to go through a separate process to get a system installed and rebated.</p>
<p><b>How are other towns involved with this initiative?</b></p>	<p>While Solarize Hot Water Western Mass and its special offer is open to all residents and businesses west of Worcester County, a few towns have signed up to be more directly involved with supporting the program. The Towns of <b>Amherst, Pelham, and Williamsburg</b> have signed up to promote Solarize Hot Water Western Mass. We'll be hosting educational "meet the installer" workshops in these towns (and in Northampton) to give you the opportunity to learn more about Solar Hot Water, get your questions answered by Spartan Solar, and sign up for a free site visit.</p> <p>Reach out to <a href="mailto:sustainability@hcg-ma.org">sustainability@hcg-ma.org</a> if you would like to get your town more directly involved with Solarize Hot Water and host an event in your town!</p>
<p><b>Why should I participate now?</b></p>	<p>Solarize Hot Water Western Mass and our special pricing offer is only available for a limited time. Only customers who sign contracts with Spartan Solar by <b>June 30, 2018</b> will receive this special discount.</p> <p>Additionally, many of the incentives and special financing options available for SHW today are expected to expire over the next few years. With energy prices on the rise again, there's no better time than now to take advantage of them and start saving!</p>

## About Solar Hot Water

Question	Answer
<p><b>What is a solar hot water system and how does it work?</b></p>	<p>Solar hot water (SHW) systems use energy from the sun to directly heat your home or business' hot water. SHW systems in Massachusetts with good sun exposure can provide up to 70% or more of your annual hot water usage.</p> <p>SHW systems are simple and work as described in the infographic below:</p>



1. Solar collectors on your roof capture energy from the sun, which is used to heat a heat transfer fluid (usually glycol antifreeze) circulated through the collector.
2. The heat in the heat transfer fluid is transferred to the hot water tank through a heat exchanger.
3. Hot water is piped throughout your home. When sunlight is weak or demand is high, a backup heating element will make sure you're receiving hot water at the temperature that you need.

**What's the difference between solar hot water and solar PV? Why should I consider SHW over solar PV?**



If you've heard about solar panels or Solarize, you might be thinking of solar photovoltaics (PV), which convert sunlight into electricity. Solar hot water systems use sunlight to directly heat your hot water.

While solar PV is making a lot of the headlines these days, SHW has been a reliable clean energy option for decades—in fact, the original solar panels President Carter put on the White House were SHW panels!

*President Carter inspects a newly-installed solar hot water system on the roof of the White House in 1979 (© 2010 Jimmy Carter Library)*

Solar PV and SHW are both reliable clean energy technologies that can save you money and reduce your carbon footprint. While solar PV will offset a bigger portion of your home's energy consumption, there are a few reasons you might consider SHW in addition to or instead of solar PV:

- **Roof/sun exposure requirements.** Most home SHW systems only have 2 or 3 collectors, which will take up about 70-100 square feet of roof space. Solar PV systems typically need more roofspace (400+ sq. ft) to cover your electricity load—and smaller systems will cost more on a per-panel basis.
- **Installation costs.** Solar PV and SHW systems can provide you with energy savings that will pay back the cost of the system in a similar period of time. However, solar PV can be much more expensive upfront: the typical out-of-pocket cost for a solar PV system purchased by a Massachusetts homeowner is over \$30,000 (~\$21,000 after tax credit).<sup>1</sup> By comparison, the typical out-of-pocket cost for a SHW system is around \$6,500 (~\$2,500 after all incentives). While SHW will offset less of your total home energy bill, it will also cost less upfront and still pay back in a similar amount of time!
- **Financing options.** Excellent special long-term, low-cost financing options are available to Massachusetts homeowners for both solar PV and SHW. The Mass Solar Loan for solar PV offers terms starting at 3.99% over 10 years. However, your options for financing a SHW system can be even better: the Mass Save HEAT Loan offers financing at **0% interest over 7 years**. Depending on how much you currently spend on heating your water, your monthly payment may be lower than what you save!

What's more, you can use the HEAT Loan to finance other home energy improvements like improved insulation and weatherization and other heating system upgrades (like heat pumps or high-efficiency boilers) to a maximum of \$25,000. If you're interested in getting a HEAT Loan to finance your SHW system, consider also packaging other home energy improvements identified during your Mass Save Home Energy Assessment. Learn more about the HEAT Loan below.

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<sup>1</sup> Based on median \$/W cost of \$4.09 for western MA counties, median size of 7.8 kW.

**Why should I use solar hot water to heat my water when I can use solar PV and a heat pump water heater?**

**Cost.** With all of the incentives included, a heat pump water heater (HPWH) and solar PV system will cost significantly more than a solar hot water system:

- The HPWH will cost at least \$2000 installed and it will require 6 300-watt PV panels to offset (assuming a 3 person household). At \$3.75 per watt installed that comes to \$6,750 (\$4,725 after the fed. tax credit).
- A SHW system will only require 2 PV panels to offset a backup electrical element.

**Site suitability.** Heat pump water heaters are not suitable for every home! The heat pump unit uses heat from the space it's in to heat water, which will increase the amount of space heating needed during the winter. Heat pump water heaters are typically not recommended if your basement is finished/partially-finished, does not have sufficient air flow, or if your home is on slab. Larger households with high water usage may also not be suitable, as the heat pump element is not able to keep up with hot water demand. Heat pump water heaters are also relatively noisy and may not be suitable for homeowners with noise sensitivity.

**Roof space efficiency.** The SHW system will make better use of the roof space because you end up getting more energy from the sun for each square foot of panel area. SHW is ~85% efficient compared to ~20% for PV.

**Greenhouse gas emissions.** While both solar PV and SHW are renewable energy sources and excellent improvements over fossil fuels, solar hot water can be better for the environment under present grid conditions. A SHW system will "charge" your hot water tank during the day (much like a battery), but a heat pump water heater with a smaller tank may need to use less-renewable grid electricity in the evenings when hot water usage is highest (and your solar PV production has dropped off).

**What are the benefits of solar hot water?**

Solar hot water can be a great investment for your home or business.

- **Energy savings.** Domestic hot water accounts for 20-30% of the average Massachusetts home heating bill. A solar hot water system will allow you to heat up to 75% of your hot water with free sunlight, saving you hundreds of dollars a year in fuel or electricity costs. If you heat your water with electricity, propane, or oil, your system could pay for itself in 3-5 years!
- **Greenhouse gases and air pollutants.** SHW systems displace fossil fuels (or electricity generated by fossil fuels) which emit greenhouse gases that contribute to climate change and air pollutants that contribute to respiratory illnesses. A family of four that installs a solar hot water system to displace electric water heating will prevent nearly 3,500 pounds of carbon emissions every year—the same as driving a car nearly 4,000 miles every year!

**How long do solar hot water systems last?**

Well-designed and maintained solar hot water systems can last for over 30 years. Some systems installed in the 70s and 80s are still functioning today! In

	<p>particular, the collectors on your roof can last for over 30 years—and the collectors Spartan Solar installs have warranties of 10 years. The most frequent maintenance required is changing out the glycol, which may only need to be done once or twice a decade. Any exterior pipe insulation on the roof may need to be replaced once every 15 years. Depending on water quality, as is typical of all hot water tanks, the tank may need to be replaced once or twice over the course of 30 years.</p>
<p><b>Will my building work for solar hot water?</b></p>	<p>The biggest factor for determining whether solar hot water will work for your building is whether your roof gets enough sun exposure. Ideally, the installation site will have 5 hours of unshaded solar access per day.</p> <p>Additionally, your roof and shingles will need to be structurally sound to support the added weight of SHW collectors. If your roof will need replacement within the next 8 years, you may want to replace your roof before installing any solar system, as the collectors/panels would need to be temporarily removed during a roof replacement.</p> <p>The best way to find out if your building is suitable for a SHW system is sign up for a no-cost home assessment from Spartan Solar. When you sign up for your assessment, Spartan Solar will do a preliminary screen of whether your roof gets enough sunlight through an online tool. If your building looks like it will get enough sun exposure, Spartan Solar will come by for the site assessment to further evaluate sun exposure and the condition of your roof to determine if SHW will be a good fit for you.</p>
<p><b>How complicated is installing a solar hot water system and how much time can it take?</b></p>	<p>Pretty straightforward! Once you're ready to install (and your rebates and permit have been secured), a typical solar hot water system installation can be completed in 2-3 days.</p> <p>The most "complicated" part of the process will be ensuring you've completed all of the steps to receive rebates, tax credits, and 0% interest financing from Mass Save. Spartan Solar is very familiar with all of these programs and will assist you in the process. Additional resources on how to complete these processes are provided below.</p>
<p><b>How well does solar hot water work in Massachusetts?</b></p>	<p>Very well! Over 800 homes and businesses have installed solar hot water in Massachusetts since 2011. Your system's production will definitely drop off in mid-winter when sunlight is at its weakest (and at night when the sun isn't shining), but over the course of the year, a well-sited solar hot water system can still provide up to 75% of your home's domestic hot water. And while we're not known for our sunlight here—western MA gets about 30% less sunlight than San Diego, CA—SHW systems installed in Massachusetts will still generate plenty of heat on overcast days.</p>

<p><b>Should I be concerned about the winter? What happens if there's too much heat?</b></p>	<p>Not at all! Cold Massachusetts winters are the reason why non-toxic glycol antifreeze is circulated through the collectors on your roof. Additionally, most of the systems Spartan Solar will be installing through the Solarize Hot Water Western Mass will be “drainback systems,” which, when the system turns off, will drain all of the glycol into a small reservoir tank (called a “drainback tank”). At the same time, air, that was in the tank, rises into the panels.</p> <p>Not only does this provide redundant freeze protection, but more importantly it protects the glycol from over-heating. Overheat potential occurs after the tank has been fully heated up and there is still more sun hitting the panels. The panels themselves are capable of and rated for the hot temperatures that can occur during stagnation.</p> <p>Snow may actually melt even faster from a flat plate collector than from your roof! Your collectors will begin collecting sunlight passing through snow. As the collector heats up, it will begin melting snow and increase the rate at which it slides off!</p>
<p><b>Is using glycol safe in my home and water?</b></p>	<p>Absolutely! The glycol Spartan Solar uses is non-toxic, is essentially a sugar (and an FDA-approved food additive), and readily bio-degrades. It also will not interact at all with the water that is used in your home: the heat in the glycol will be transferred to the water in the solar tank through a heat exchanger.</p>
<p><b>What equipment is being installed through this program?</b></p>	<p>Spartan Solar offers the following equipment for typical solar hot water installations. Additional models may be available—speak with Spartan Solar to learn more about your options.</p> <ul style="list-style-type: none"> <li>• <b>Collectors.</b> Spartan Solar will install Sunearth TRB-32 and Heliodyne GOBI 406 collectors.</li> <li>• <b>Tank.</b> Spartan Solar will install 80-160 gallon tanks (Sunearth SUHE80-1 and 120-1, Stiebel Eltron SBB600 Plus) in most homes.</li> <li>• <b>Meter/Data Logger.</b> Spartan Solar installs Resol DL2 Solarwave data loggers.</li> <li>• <b>Freeze Protection.</b> Spartan Solar installs drainback systems in most homes.</li> </ul>
<p><b>When is solar hot water not recommended?</b></p>	<p>Even if you have an ideal site for solar hot water, there are certain cases where it may not be the best fit. In order to capitalize on the benefits of solar hot water, you need to use enough hot water (i.e. be using enough energy to have energy to save!). While this may sound obvious, the payback for single-person households may be prolonged because there simply isn't much hot water use.</p> <p>Also, natural gas continues to be extremely cheap. Even with the generous incentives, the payback for solar hot water when displacing natural gas water heating may be more than 10 years.</p>

	Finally, if you happen to not pay much in federal income taxes, you may not be able to take advantage of the lucrative 30% federal tax credit, which may make the system too expensive.
<b>How much do solar hot water systems cost through Solarize Hot Water Western Mass? How large are the incentives?</b>	Consult our pricing, incentive, and financing guide for additional information.
<b>Will my water be too hot if a solar hot water system is installed?</b>	Don't worry: all solar hot water systems come with an anti-scald mixing valve to ensure water doesn't exceed the setpoint temperature (typically around 120°F)