



Financing a Solar Photovoltaic System: Choose the method that is best for your house of worship.

By Jim Nail

Solar panels provide a renewable source of

electricity that emits no climate-change-causing emissions. This is reason enough for people of faith to consider installing solar but, of course, there are financial realities that houses of worship (HOW) face. The good news is the cost of solar photovoltaic systems (aka, solar panels that produce electricity) has dropped 60% in the past 10 years, making it quite common that the \$50,000 - \$75,000 cost of a system for a typical house of worship will pay for itself in 8 to 10 years. In addition, several financing options make it even easier. This EES Brief compares these options based on the example HOW and system described to the right.

Baseline: Buying electricity from the utility will cost \$125,000 over the next 20 years

If the example HOW continues buying electricity from its utility, it can expect to spend about \$125,000 over 20 years, assuming a 2.27% annual inflation rate (2.27% is the average inflation rate for electricity in Massachusetts since 1990). Since solar panels will last at least 20 years, an HOW considering installing solar panels should compare the economics of solar to this business-as-usual case.

There are three financial benefits to consider in evaluating the financial aspect of solar panels:

- 1. Reduced electricity costs.** Because the panels are producing electricity, the house of worship no longer needs to buy it from a utility such as Eversource, National Grid, WMECO, etc. Under Massachusetts' "net metering" policy, in months when your solar panels produce less than your building uses, you are billed only for the amount of electricity that exceeds what your panels produced. In months when you produce more electricity than your building uses, your account is credited with the value of the excess. (Note: the amount credited to your bill may be

SOLAR EXAMPLE

To illustrate the different financing options, this paper will use the following example system, based on Massachusetts Interfaith Power & Light's experience and approximate system costs as of spring 2022.

House of worship total annual electricity use:
20,000 kilowatt hours (kwh)

Electricity cost 2022:
\$.25/kwh

20-year cost of buying electricity from utility:
\$125,000 (including 2.27% annual inflation)

Solar panel system size:
17 kilowatts DC

Annual estimated solar electricity production:
19,500 kwh

System cost: \$51,000

less than the full cost per kwh, depending on the size of your system and the type of electric service at the building.)

2. **State incentives: SMART.** The Massachusetts incentive program called SMART gives owners of solar panels a quarterly payment based on how much electricity the system produces. The incentive amount is designed to decrease as more solar systems are built and varies by the area the state and the utility which serves the building. In the first half of 2022, electric rates spiked due to higher natural gas prices and as a result the SMART incentive was \$0 (or near zero) in National Grid, Unitil, and Eversource western Massachusetts areas; systems in Eversource East earn \$.054 per kilowatt hour and Nantucket systems earn \$.024 per kilowatt hour. These numbers continue to change and your installer will provide the then-current rates with your proposal. This incentive is not available if you live in a town with a municipal electric company.
3. **State incentives: Class 1 Renewable Energy Credits (RECs).** An alternative to the SMART program is participate in the Renewable Portfolio Standard (RPS) by qualifying for Class 1 Renewable Energy Credits (RECs). New systems can qualify for either SMART or Class 1 RECs but not both. Unlike SMART which pays a fixed amount per kilowatt hour, RECs are sold at auction and so the price varies. In recent years the price has varied between \$.04 and \$.05 per kilowatt hour. In the areas where the SMART incentive is zero, Class 1 RECs are being used.

A Word About “ROI”

In many of our discussions with HOWs about solar, we hear the objection that a breakeven period as long at 11 years is not a good ROI. MassIPL respectfully disagrees. Often in our private or business lives, we judge investments on shorter time horizons, looking for a 4 – 5 year breakeven, but we feel HOWs should take a different perspective for 3 reasons:

1. An 11-year payback is still a 6.5% annual rate of return. And HOWs whose breakeven is closer to 8 years see a 9% rate of return. While interest rates have been increasing lately, it is still hard to find a safe investment with this high a rate of return. For example, 10-year Treasury notes are paying about 3% and bank CDs are in the 2.0 – 2.5% range in 2022. Solar panels are a safe investment because as long as the sun shines, you are guaranteed to get your “dividends”!
2. HOWs have a longer time horizon than businesses. Many of our faith communities have been around 50, 100, 150 years or longer. In this context, a 10-year breakeven is quite reasonable.
3. Our mission is to live out our beliefs. While we must be good stewards of our congregations’ finances, we don’t judge our success by quarterly or annual profit and loss statements. We meet and worship in community to bring to the world the values expressed in our scriptures and traditions. Solar panels’ contribution to our community being better stewards of God’s Creation and lessening our contribution to climate change and the suffering it causes add a different type of “value” to the financial return of this investment.

There Are Many Options For Installing Solar Panels

For many HOWs, raising \$50,000 - \$100,000 for solar panels is somewhat daunting. Fortunately, purchasing the panels directly is only one of several options available today. Determining the right way to finance a solar panel system is often the hardest part of the project: No single financing approach works for every HOW and considering which approach is best for your HOW’s situation is important.

We review the most common options below and are happy to consult with our members as they evaluate them.

Purchase: The Greatest Savings, Easiest Process

The easiest, and in the long run, most financially beneficial approach, is to purchase the system. The financials of each installation will vary, so let's take a look at three examples;

- “Worst case” scenario: No incentives, partial net metering credit. In this example, the HOW is in an area where SMART is not available, opts not to receive RECs, receives full net metering credit for half the electricity, and 60% of the value for the half of the electricity that is excess. The solar panels would pay for themselves in about 11 years.
- Common scenario: \$.04/kwh incentive, partial net metering credit. In this example, the HOW receives a state incentive (either SMART or Class 1 RECs) but only gets full net metering credit on half of the electricity produced and credit for 60% of the value of the other half of the electricity. Here, the payback is slightly shorter at about 10 years.
- Best scenario: \$.04/kwh incentive, full net metering credit. This lucky HOW will see the panels pay themselves back in slightly over 8 years.

Even if an HOW is in an area that resembles the “worst case” scenario, solar is still good financial decision for the congregation to make for the long term. Solar panels are typically warranted for 20 or 25 years so even if the breakeven points is 11 years, the panels will continue to deliver free electricity for another 14 or longer.

Houses of worship with an endowment should first evaluate borrowing from these funds to install the system and use the savings and SMART payments to repay the endowment. As noted above, conservative investments like government bonds or certificates of deposit likely pay 3% or less while an investment in a solar system will likely generate the equivalent of 6% or more.

Advantages: Highest savings, simplest to understand and execute.

Factors to consider: Requires money upfront, either by congregational donations, borrowing from the endowment or a taking out a loan (see below). As owner of the system, the congregation is responsible for maintenance of the system, but this should not be a major obstacle. Solar panels require very little maintenance; the major maintenance item that can be expected is replacing a component called an inverter after about 15 years, which may cost \$3000 - \$5000 depending on the size of the system and the future changes in pricing for this piece of equipment. You may want to pay for an annual inspection, as you do for a heating system or other major piece of equipment, and your solar installer will likely offer you an annual service contract at a modest cost.

Loan: Low Interest Rates May Be Available

The purchase of a system may be financed by a loan. The combination of electricity savings and the SMART incentive is likely to provide enough income to cover the monthly payments on a 10-year loan carrying up to a 7% interest rate, meaning this loan would not affect the annual budget. Some denominations offer reduced-rate loans, often 4% or lower; at this rate, your house of worship could save around \$1000 per year – see the Resources section for a list of denominational loans sources.

Advantages: Simpler to understand and execute than methods involving additional parties (such as a power purchase agreement explained below) and long term likely provides greater savings. After the loan payoff, 100% of the savings belong to the house of worship for remainder of the 25+ year life of the system.

Factors to consider: The interest rate limits savings in the initial years and the interest rate will determine how long it will take to pay off the loan.

Power Purchase Agreement (PPA): No Cost Upfront, but Lower Savings and 15 – 20 Year Contract is Required

Many HOWs ask how they can also get the benefit of the 26% federal tax credit. Because this is only available to tax-paying individuals and organizations, it is not available to houses of worship since they don't pay taxes. However, this has spawned what are known as "third party ownership" or "power purchase agreement" models where a tax paying company or individual who can use the tax credit funds and owns the system for the period of time required by IRS rules to claim the credit.

This has been the most popular approach for several years. An outside company owns and installs the system, takes advantage of state and federal incentives, and the house of worship only pays for the electricity the system produces. Typically, the cost of the electricity is guaranteed to be 10% (sometimes as much as 15%) below the going utility rate for the 15 – 20 year life of the agreement. The important terms to evaluate are the starting cost per kwh, what if any inflation adjustment is included (and whether this adjustment is a set annual rate (usually 1% - 3%) or is tied to increases in the electricity rate of your utility), and terms for buying the system prior to the end of the contract. Both of MassIPL's solar partners offer PPAs, if a system meets their size requirements.

Advantages: Immediate savings, no money required upfront, the PPA company has responsibility for maintenance of the system. The PPA company has one or more installers that they work with regularly, so the congregation does not need to seek their own installer. Ability to own the system, either at the end of the contract or earlier.

Factors to consider: Requires a 15 – 20-year contract with the PPA company and results in lower savings than owning the system; these contracts are long and require careful review. Requires a relatively large system, at least 30 kw, and often 40 kw or more. These contracts often allow you to buy the system at a depreciated price, often as early as year 6 following installation, providing the HOW a path to ownership of the system.

Pre-Paid PPA: A Hybrid Model Offering Good Savings And Early Ownership

Collective Sun, a partner of the national Interfaith Power & Light organization, offers a "pre-paid PPA" that is a hybrid of the purchase and PPA model for relatively large systems, ie, over 50 kw. When the house of worship selects a solar installer, they engage Collective Sun who will bring in an investor who initially funds the installation and takes advantage of the federal tax credits. The house of worship then pre-pays the full cost of the PPA payments which is calculated at 12% below the cost of purchasing the system outright: i.e. If the system costs \$150,000, the pre-paid PPA payment is \$132,000. The house of worship receives no further bills from Collective Sun or its investor and gets the full savings of the lower electric bills plus the state incentives. Collective Sun's

SunForAll program provides a 10-year low-interest loan for the full amount of this payment. Or the house of worship is free to finance this pre-payment from their endowment, donations/loans from parishioners, or other loan. You can learn more at their web site <https://www.collectivesun.com/>

Advantages: Collective Sun's investors share more of the federal tax incentives with the house of worship than other PPA investors. The HOW gets immediate, significant savings on their electricity bills and revenue from any state incentives.

Factors to consider: Because this option is available only for larger systems, it may not be available to your HOW. As with the purchase option, the HOW must determine how to fund the upfront payment.

RESOURCES

Below are links and contacts to MassIPL solar partners and the organizations mentioned above:

Solar installers

621 Energy: <http://www.621energy.com/> Contact Bob Clarke, clarker@621energy.com

Resonant Energy: <http://www.resonant.energy/> contact Madeleine Barr, madeleine@resonant.energy

Energy Sage: www.energysage.com/mipl

This is an online site where you set up a free account, list your property, put in some information about your electric utility and monthly/annual kilowatt hours and subscribing installers contact you if they are interested in the project. An easy way to find multiple installers and get multiple quotes.

Sources of loans

United Church of Christ Cornerstone Fund

<https://www.cornerstonefund.org/churches/borrowing/mortgage-loans/energy-improvements/>

Episcopal Diocese of Massachusetts Green Loan

<https://www.diomass.org/resources/grants-loans/creation-care-initiative>

Unitarian Universalist Association Building Loan Program

<https://www.uua.org/finance/grants/buildings/loans>

Episcopal Church Building Fund (will make loans to churches of other denominations)

<https://www.ecbf.org/loans-parishes-ministries/>

Wesleyan Investive (Available to United Methodist churches, boards, and organizations)

<https://www.wesleyaninvestive.org/loans>

Financing partners

Collective Sun

<https://www.collectivesun.com/>

MassIPL is also aware of two other unique programs and will assist members in evaluating if they are appropriate for their situation.

Self-financed PPA: Complicated Legal and Tax Issues, but Higher Savings Potential

Under special circumstances, it may be possible for your congregation to create its own PPA financing organization, though the complexities make this a very rare occurrence. There are significant legal, tax, and accounting issues that must be carefully worked through. The group of parishioners who invest in the system must form a limited liability corporation (LLC) and must have passive income (most commonly rental real estate income) to take advantage of the federal tax credit. Annual corporate tax returns must be filed for the LLC, the LLC must make periodic payments to the investors, and annually issue a K-1 statement to each investor for their tax reporting. But these members will likely be willing to pass more of these savings on to their house of worship than a for-profit PPA financing organization. MassIPL partner Resonant Energy can advise on this approach and provide template documents.

Advantages: Potentially higher savings and/or shorter contract term for the house of worship than a PPA provided by a for-profit PPA financing company.

Factors to consider: Complex and requires expensive legal and tax advice. Congregation members who are potential investors must be identified, solicited, and involved in the program. Ongoing administrative tasks must be executed for the life of the contract.

Batteries: An Up-and-Coming Option

As batteries, come down in price, more HOWs are considering installing them with their solar panels. We won't cover them in detail here but they are worth discussing with solar installers who provide proposals to you. While they will add significant cost to the project, there are additional incentives that will offset part of this cost:

- Additional SMART incentive: The SMART program provides an additional “Energy Storage adder” incentive that must be calculated by the installer.
- Higher net metering value: If your system does not earn full net metering credits in months when you produce more energy than you use, batteries allow you to store and use electricity rather than pull it from the grid.
- Earn payments for supplying “peak power”. The MassSave ConnectedSolutions program allows your utility to draw power in your battery during “peak electricity events” (eg, a very hot summer day) and pays you. The program estimates a typical battery installation enrolled in the program could earn \$1375 per year.

Let MassIPL Help Your House of Worship Go Solar!

Given the urgency of climate change today, it is imperative that faith communities do all they can to address climate change and installing solar panels makes a significant contribution. With this range of financing options available, houses of worship have choices that will enable them to find one that fits their circumstances. Massachusetts Interfaith Power & Light has advised over 50 members on their solar projects and will help you!