

Investor Model for Solar Installations for Houses of Worship / Non-Profits

Murray Rosenthal and David Lewis - Genesis of Ann Arbor and Solar Faithful

Foreword by Bob Chapman

This concise manual was written with a specific goal and for a specific target audience. The goal is to remove one of the biggest barriers for houses of worship (HoW) and other nonprofit organizations to begin using renewable energy. That barrier has been the initial cost required to get a system up and running. The interest is plainly there. For decades in the governing bodies of temples, churches, synagogues, and mosques have raised the question “If our faith calls us to be stewards of the environment, why aren’t we using renewable energy for our operations?” Often the answer has been “We can’t afford it” or “It is too costly” or some other variation citing a financial barrier. Underlying every objection was the same question that every faith community must answer before undertaking any faith-based enterprise: “Can we afford to do this?” When it comes to using solar power, this manual provides one answer to that question.

It is not the only answer. Congregations have used self-funded projects through capital campaigns or existing reserves. Some have purchased green power from other sources without putting up their own solar arrays. And some HoWs decide to live out their environmental stewardship values in other ways, such as investing in energy efficiency, recycling, reducing the use of pesticides and, increasingly, paying more attention to their water use and stormwater runoff. Of course, before exploring solar options, many of these other strategies, and especially energy efficiency should be adopted.

I said this is not the only answer but for the right situation it is a powerful solution. Investor owned power purchase agreements (PPAs) are nothing new. Indeed, when you pay your electric utility bill in most cases (DTE, Consumers Energy) you are buying power from an investor owned power producer. The difference and the beauty of this model is that it creates an opportunity for creating a *local small-scale* power production installation. This is energy democracy. This is socially responsible investing. This is faith in action.

I congratulate the authors of this manual. They have distilled the lessons from many, many projects so that you do not need to recreate (or invent) a lot of wheels. They have summarized several best practices and organized them to create a very readable roadmap. I speak from experience. Besides having a solar array on my own house for the past 5 years (giving me an electric bill most months of about \$9.00), my wife and I were investors in what I believe was only the second PPA in Michigan at our house of worship near downtown Detroit. Done right, as this manual lays out, a PPA can be right for the investor, right for the congregation and right for the environment. In these times where we already are seeing the effects of climate change falling disproportionately on the poor, increasing the use of renewable energy in this manner is an act of environmental justice. I congratulate you on taking a hard look at this model to see if it is right for your congregation or organization.

Peace,

Bob Chapman

Former Executive Director of Michigan Interfaith Power & Light and of EcoWorks Detroit

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This document is a HoW-To. HoW do we get solar installed on our buildings using the “Investor Model”? Because Houses of Worship (HoW) and nonprofits, including condo associations, do not pay taxes, they cannot directly take advantage of the Federal Solar Tax Credit (See Figure 1). From this figure, you can see that immediate action is required, as the tax credit is diminishing! It is also recommended that everyone pressure their senators and congress people to extend and broaden this credit.

The investor model has been a huge success at many HoWs / nonprofits in Southeast Michigan. More on this in Appendix A.

Why do this? The primary reason is to reduce the carbon footprint of our building. Dividends from energy savings improvement also include:

1. Long-term energy cost savings
2. Many congregants may investigate reducing their own energy footprint
3. Increased property value

Reducing our carbon footprint, obviously is of benefit to our environment. Protecting our environment is deeply rooted in our beliefs and values¹. And reducing our carbon footprint gives us hope that we and future generations will not need to suffer the consequences of global warming, such as shifting climate patterns, weather disasters and our flora, fauna and oceans being damaged.

Genesis of Ann Arbor is unique. Energy-savings are inherent in our shared building, as Genesis is the partnership of St. Clare’s Episcopal Church (uses on Sundays) and Temple Beth Emeth (uses Friday evening and Saturday). And a third congregation, Blue Ocean Faith, meets in our social hall on Sundays. There is also a daily preschool; thus, use of the building is high. Sharing the same building saves both energy and money (construction and maintenance costs are shared). Not only is the building shared; but our congregations share common values and beliefs. One of our important shared values is environmental stewardship; we believe saving energy is critical to making an ethical, moral and spiritual commitment to protect the environment and God’s creation.

Another shared value at Genesis, is our mission to helping people in need. The Genesis-sponsored Back Door Food Pantry supplies food to those who come to our door in a welcoming, friendly and non-judgmental environment. Currently, 250 people each week depend on our pantry for basic food support. When considering solar panels, your decision makers will be studying return on investment. They will likely demand at least a break-even projection in terms of dollars. The authors of this HoW-To believe solar is worth doing with no monetary return on (which is not the case; following this HoW-To will create a small profit for the investors and save thousands of dollars for the HoW). There is no monetary return on investment for feeding those who would go hungry without our help. We believe that values (e.g., helping the poor and saving the environment) are more important than monetary return on investment – there is a big return on investment our efforts - knowing our missions help others and protect God’s creation.

¹ For a detailed discussion on HoW the tenets of your religion support protecting the environment, see <https://www.unenvironment.org/about-un-environment/faith-earth-initiative/religions-and-environmental-protection>

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Here is the HoW to:

Step 1. Get initial buy-in

This is not a hard step. Typically, people in charge are all about saving the environment and saving money (yes, solar panels will save money spent on electricity bills in the long-term). Talk to the clergy/ lay leaders / board members about your idea in general terms. Tell them we can get solar installed at no cost (no donations, no loans, no payments) using the investor model. Make them an offer they can't refuse! Tell them about similar success stories at other buildings. If you need to, invite in an expert, a volunteer who has done this on his / her building. Tell your leaders that this is just an idea to explore for now. They are not agreeing to do this right now.

Step 2. Form a committee.

It can be a committee of just one (you) but having a wingman or wingwoman or two will increase momentum and get the ball rolling downhill. You can call it the "Green Team" or any other creative moniker. Hold a meeting and assign action items for the next few steps. Also, the Green Team should be focused on other energy-savings improvements. Get your lights converted to LEDs! However, because of the quickly disappearing tax credit, we recommend you focus on solar as the primary goal until the panels appear on your roof.

Step 3. Run the numbers / roofs count

Tabulate your energy usage. Get the log-on info for your electric utility and tabulate (i.e., use a spreadsheet) your monthly electric use and dollars paid over the last three years. It is also recommended (but not required) that this data be entered into the web app Energy Star Portfolio Manager (enter your natural gas and water numbers also). Energy Star Portfolio Manager (<https://portfoliomanager.energystar.gov/pm/login.html>) data² is used to track your carbon footprint and benchmark versus similar buildings with the same use. And you can use this data to enter energy saving contests and win valuable prizes! But before you can calculate the return on investment, you will need to know HoW much the installation will cost. Also, you need to know about your roofs. It does not make sense to put panels on an old leaky roof that will need to be replaced in the next five years. Find out the age and condition of all the flat roofs and south-facing pitched roofs.

Step 4. Get quotes

We recommend that you get at least three quotes. Get quotes from reputable installers, ones who have worked with HoWs in the past. Let's shoot-for-the moon (or sun?) and cover the entire flat and south-facing gabled (pitched) roofs. Your solar installers can easily do this using satellite imagery, which includes sun exposure over time numbers. Yes! On your first call, they can tell you:

- HoW many panels can be installed?
- Type of panels (traditional vs. shingles) - please note, the solar shingles may be a good option for those that dislike the look of solar panels, but they cost about twice as much, and generate about half the electricity per square foot (resulting in about a 4:1 ratio of cost per watt).

² Energy Star Portfolio Manager likely requires some training / help to set up

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- HoW many kW your system will generate. This is the max power the system can produce under the best sunshine conditions.
- HoW many kWh your system will generate each month on average.
- Your installer will ask for the average kWh you use per month.

After the call, your installer will likely ask to see your building and after that they will provide you with a detailed quote, including the estimated return on investment. Take them at their word, as you did choose reputable installers, right?

Almost all the solar power generated will go to directly power your lights, computers and HVAC systems. However, there will be times when you generate more power than you are using. The excess current can go onto the grid (typically recommended for large buildings like yours), or it can be stored using a battery system (recommended for houses). Because your electric utility is not your friend, as you are taking away a small part of their business, if you put power on the grid, they will bank it for you. But they will likely sell you back your own power at a wholesale price, which is likely about half of what you currently pay for power. Therefore, you don't want your system to be too big. Your solar installer will help with this. It is likely that, once you get your average monthly power above 35% of your usage, you will be putting a significant amount of power on the grid. So, consider batteries or opt for a smaller solar system. If your building is not occupied most of the week, as some HoWs are used primarily on Sunday, batteries may be best.

Step 5. State your intention to find investor(s)

Talk to the clergy/ lay leaders / board members about your idea in specific terms. SHoW them the quotes and discuss return on investment. Perhaps you already have an investor in mind that can fund the whole installation. If not, tell them you will be publicizing and soliciting the congregation for interested altruistic investors. They will say yes!

Step 6. Find your investors

Use multiple means of communication to get the word out. Word-of-mouth is best. But here is a bulletin notice that we used at Genesis:

Solar Panel Investment Group

To reduce the carbon footprint of our Genesis building, interested congregants of TBE and STC will be considering the formation of an investment group. This group will purchase solar panels, to be placed on two roof areas of our building. The electricity from these solar panels will generate up to 35% of our building's power. The investor group will be paid monthly by Genesis for the generated green power, via a Power Purchase Agreement.

If you are interested in making an environmentally friendly investment, please attend an informational meeting on Monday, October 15 at 7 pm at the Genesis Building.

Contact Murray Rosenthal, scibridge0@gmail.com, with questions.

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Multiple communication channels are the best. Over-communicate. Arrange to get the message in your Sabbath service bulletin and stand up during announcements and ask for interested individuals to buttonhole you. The good news is that you will have people who are interested.

Step 7. Provide Details to the interested potential investors

Once you have a general idea of the cost of the system, come up with a minimum investment amount. We recommend this to avoid the situation of too many investors. There are some administrative tasks involved with the operation of the LLC, and the more members you have the more work it will be. We think a group of 10 to 20 investors is a good size. Figure out a nice round number that is around the cost of the system divided by 15 or 20. For Genesis, we came up with \$5,000 as the minimum. We also recommend that the investment is more than the cost of the solar panels. For Genesis, we collected \$10,000 more than the cost of the system to provide cash for our annual expenses (insurance, tax preparation, etc.). Keep in mind that this is a minimum - investors can invest more if they choose. (We budgeted \$2,000 / year for costs, and we intend to own the system for 5 years, so that is HoW we came up with \$10,000.)

Step 8. Analyze the system / create reports

We hired Diane Cheklich of D2 Solar to create reports for us (once we had a sense for the system cost and system size) that modeled the typical annual energy output of the system and the cash flow. This enabled us to explore different options as far as selling price per kWh and selling price for the system at different points in time. It is possible that the installer will be able to do this for you, but we decided to hire a third party since we wanted this information prior to committing to an installer.

Step 9. Set up the LLC

Once you feel confident that there are enough people seriously interested in investing, go ahead and set up the LLC. The first step is to register the LLC with the State of Michigan. This can be done on-line and cost \$50. It is quite easy to do - though you need a name (and one that is not already in use). The next step is to apply for a Federal Tax ID number with the IRS. This is also done on-line and is also very easy to do.

Step 10. Create the LLC operating agreement

Solar Faithful has a template LLC operating agreement. You can use this as a starting point. Or you are welcome to use the Eastover Power (Genesis) operating agreement as a template if you like. The operating agreement includes items like: who can be an investor, HoW rules are created and changed, what happens to an investor's stake if that investor passes away or leaves the congregation, etc.

Step 11. Have investors sign a subscription agreement / commitment form

This form provides the investor's name, address, social security number, number of shares / amounts of investment, and language acknowledging their receiving, reading, and accepting of the operating agreement rules / terms. Whether you want to collect checks right away or only after you are 100% sure everything else is in place, that is up to you. At Genesis, we did not collect checks right away since we were doing this step while still waiting for all the parties to formally approve the purchase.

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Step 12. Open a bank account for the LLC

Open a commercial bank account for the LLC. The bank will want to see the LLC paperwork from the state, the Tax ID number from the IRS, and an executed LLC operating agreement. (You may want to select / appoint officers of the LLC. The officers will be the ones to sign the LLC operating agreement.) Once you have the collected checks from the investors, deposit the checks into your new account.

Step 13. Select an installer for the solar panels

Obviously, the cost will be the main variable you will compare when deciding which installer to select. However, there are other items to consider: customer service, references, quantity and quality of panels, etc. Hopefully, you will get a sense for each installer during the time you are collecting quotes, and this will help you select the right one. It is typical to look at the cost “per watt” of a PV system. Residential systems tend to be in the \$2.70 to \$3.00 per watt, while commercial systems tend to be in the \$1.85 to \$2.15 per watt (these numbers may be out of date by the time you are reading this). Selecting an installer can happen earlier in the process - which I would recommend if the installer is willing to get on-board without a deposit. The installer will have lots of information and could be really helpful, but they typically need a deposit up front. Our installer was willing to help us out just based on our commitment to hire them knowing that it would be awhile before we were able to pay them the deposit. Examine the agreement with the installer carefully. Some items that should be covered:

- Number of panels, where on the building they will be installed, panel specifications, panel warranty, size (in kW), racking warranty, inverter warranty, power optimizers warranty, transformer warranty and warranty on wiring, labor and installation.
- Forecast on annual generation, including an annual degradation rate.
- Power monitoring – HoW will you be able to see HoW much power is being generated per unit time (e.g., the SolarEdge app).
- Safety features, i.e., when the grid-tie inverter is disconnected (turned off) or grid power is down, the solar array voltages are reduced to safe levels by the DC optimizers. This maximizes safety for installation, maintenance and any future work on the array.
- Cost (when down payments and final payments are due).
- Inspections and grid tie (HoW long the power company should take to connect your system to the grid).
- Solar credits. Solar credits are not currently valued in Michigan. However, they may be saleable in the future. Solar credits should belong to the HoW and not the installer.

Step 14. Finalize the Power Purchase Agreement - Obtain Board Permission to Proceed

The Power Purchase Agreement (PPA) is the agreement between the LLC and the HoW that outlines the cost of power generated by the panels, and the method(s) for the transfer of the panels to the HoW. Some PPAs have a built-in increase (per year) to the price per kWh, and some have a fixed price. Some LLCs plan to hold on to the panels for 20 years and then donate the panels to the HoW, while others provide a schedule that determines the sale price of the system to the HoW starting in year six, with the price dropping each year (until the system is donated at year 20). The panels have a 30-year life span (with a small degradation of performance over time).

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Bring the agreement to the HoW Board of Directors for a vote. LLC members who are on your Board should recuse themselves from the vote. This should be a rubber stamp, as people on the Board should have already made their opinion on acceptance known. Here is the Genesis story on Board approvals. If we could do it, you can do it! Genesis needed and got approvals from five (5!!!) different entities: The Genesis Board, the Temple Beth Emeth Board, the St Clare's Vestry, the Episcopal Diocese and the St Clare's had a congregational vote. Getting this approval (or approvals) could take time; thus, it is important to start this process now, so that you can take advantage of the maximum tax credit available.

Step 15. Decide on insurance. There are likely two options. The panels can be insured through the existing building insurance policy. The other option is for the LLC to obtain insurance on the panels. It is very likely the existing policy will be the less expensive route, as a new policy for a new LLC may be expensive. The LLC can reimburse the HoW for insurance costs or the HoW can decide to make this payment itself; this payment should be covered in the PPA. The risk of the solar panels coming off their moorings and being destroyed and/or destroying adjacent property is minimal. Of course, the exception is a tornado or very bad storm; in that case, not only will the solar panels be impacted, but your entire building will likely sustain damage. That is what the insurance is for. The solar panels increase the value of your building; it is likely your premium increase will be based on the cost of the system. The insurance costs should be very minimal. For example, the cost of the installation at Genesis (160 panels; a 64-kW system) was \$120,000. Insurance cost is being billed through our building's insurer at \$138 per year.

Step 16. Select an accountant / tax preparer

This step can also happen earlier in the process, which I think could be helpful. Our accountant was able to clarify many questions we had. Once the LLC is up and running, it will need to file a tax return every year, and issue Schedule K forms to all the investors. Note: LLCs do not pay any taxes directly. All tax related issues are "passed through" to the owners via the Schedule K.

Step 17. Schedule the installation, sit back and relax

Make the deposit with your installer. Work with your installer and your facility personnel to schedule the installation. Work with the installer to figure out HoW the wires will run down the building into your meter area and where the grid connection is. Figure where the inverter and transformer will go. Make sure that the installer is given designated areas/parking to stage their equipment and the installation materials (panels, racking, etc.). The installer should be contacting all the entities that have to approve the installation: the city and the electric utility. They should pay any inspection fees.

Here is a note on inspections. It is important that all required inspections occur. Ask your installer for a copy of all inspection documents, as you will likely need them for the insurance underwriter.

Now it goes quick and easy. It should only take a week or two for the install (this duration can be weather dependent). The installer will test the system. And then the inspections must then occur. The utility may drag their feet installing a new solar compatible meter and turning on your panels. It's tough to wait for all of this to happen - after all the sun is shining and the panels could be generating electricity. It will happen soon. Patience is a virtue.

Step 18. Celebrate and view your power charts

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The installer will link you up with on-line software that monitors your system in real time. You can see HoW much power the system is generating at any given moment. This software will also track the accumulated power for each week, month, and year.

Some key items for the investor model:

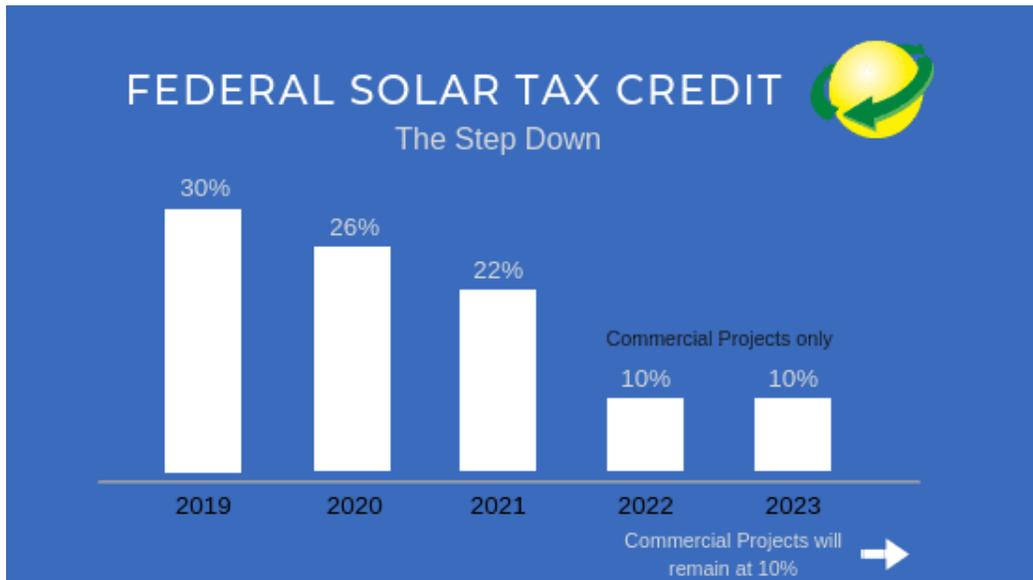
- The amount of the tax credit is based on the year construction of the system is started, not the year the system is completed. If you want the 26% 2020 tax credit, the system needs to be started by December 31st, 2020. The threshold for “starting” is: physical work of a significant nature (Physical Work Test), or by meeting a safe harbor based on having paid or incurred five percent or more of the total cost of the system (Five Percent Safe Harbor).
- The LLC gets to depreciate the cost of the PV system. Unlike the actual tax credit (which is a straightforward credit for each investor), the depreciation applies to the LLC’s cash flow. We are expecting the depreciation to cancel out any income tax from the income for the first 7 years.
- The IRS requires the entity that benefits from the tax credit to own the system for a minimum period of five years. If the system is sold before the five year mark, the people who claimed the tax credit need to pay the money back to the IRS (each year the system is owned gives you the right to keep 20% of the tax credit).
- The LLC should have some funds, we suggest ~10% of the installation costs, should be collected from the investors, in case something goes bad after the warranties expire. Although, except for the inverter (cost ~\$2000 to \$4000), this is unlikely to happen, the money can always be returned to the investors when the system ownership is sold or donated back to the HoW.

Some questions you may get:

- Impact of panels on roof warranties - Although you may want to check, and we did, there is no likely impact on your roof warranty. The panels also protect the roof from normal degradation from the sun and weather. They protect your roof and we know of no reason why a roof warranty would be impacted.
- Roof repairs - the panels can be removed for roof maintenance. This would be much easier to do on a flat roof, as the only thing that prevents the panels from moving is a concrete block ballast. On a slanted roof, there could be some cost for removal and replacement. The best idea is to install the panels on a young roof.
- Solar panels vs. solar shingles - There is a solar shingle option that is available. HoWever, the cost of these is currently about twice what solar panels cost. There can also be interconnection issues; if a connection in the wiring fails, it may be very difficult and expensive to find a short in the system.

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Figure 1. Federal Solar Tax Credit



Acknowledgement

This HoW-To has drawn from a valued document on HoW solar installations:

[https://d3n8a8pro7vhmx.cloudfront.net/michiganipl/pages/71/attachments/original/1531431081/Going_Solar - Guidebook for Houses of Worship.pdf?1531431081](https://d3n8a8pro7vhmx.cloudfront.net/michiganipl/pages/71/attachments/original/1531431081/Going_Solar_-_Guidebook_for_Houses_of_Worship.pdf?1531431081)

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Appendix A. Summary of Success at HoW in Southeast Michigan

HoW	First United Methodist Church	Seventh-Day Adventist Church/School	First Congregational Church	Ozone House	Genesis	St. Peter's Episcopal Church
Location	Ferndale	Ann Arbor	Ann Arbor	Ypsilanti	Ann Arbor	Detroit
Sponsor	Diane Cheklich	Scott Nelson	Dan Jacobs	Jan Culbertson	Murray R/David L	Bob Chapman
# of Panels	64	80	54	99	160	32
kW	19.6	31.2	17.25	30.9	64.0	10.6
kW/Panel	0.31	0.39	0.32	0.31	0.40	0.33
Total Investment \$	\$47,840	\$62,965	\$55,000	\$80,000	\$130,000	\$27,150
\$/kW	\$2,440.82	\$2018	\$3,188.41	\$2,589.00	\$2,031.25	\$2,561.32
Included costs	\$800 for legal fees	None, solar only	\$10k for racking; \$4k to fund LLC	\$4000 to fund LLC; 25 yr. warranty incl. inverter replacement	\$10,000 to fund LLC	Includes 25 yr. inverter warranty
Install Date	APR 2017	AUG 2019	DEC 2019	JAN 2020	JAN 2020	DEC 2018
% of Electricity	29%	N/A	25%	N/A	31%	25%
Funding	LLC	LLC	LLC	LLC	LLC	LLC
LLC # Members	1	1	5	4	20	1
% of Electric rate	92% of DTE rate	90% of DTE rate	90% of DTE rate	90% of DTE rate	92% of DTE rate	75% of DTE rate
Buyout	FMV at year 20	>6 years	0% loan at year 7	>6 years	>5 years	>5 years
HoW Savings	\$24K over 20 years	\$120K over 25 years	\$40K over 20 years	Depends on buyout	\$397K over 30 years	\$40K over 25 years
Annual ROI for LLC	3.5%	0%	0%	2.0%	2.6%	2.0%
Installer	Srinerger	Homeland Solar	Homeland Solar	Distributed Power	Homeland Solar	Distributed Power

Totals: 489 Solar Panels; 174 kW; \$403K Investment FUMC Ferndale: dianec@d2solardetroit.com; St Peter's Episcopal Detroit: Bob Chapman chapmanbob10@gmail.com; First Congregational Church: djacobs@ac3.com; Ozone House: jculbertson@ac3.com; Seventh-Day Adventist Church scottreidnelson@gmail.com 2qa7UHN