



California Interfaith Power & Light

Energy Efficiency and Solar Resource Guide: An Overview for Congregations



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For questions regarding this guide please contact, **California Interfaith Power & Light**
In Northern California – (415) 391-4214; In Southern California – (310) 752-3436
www.interfaithpower.org

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(Cover page: Kehilla Community Synagogue, Oakland; First UU Church, San Diego; St. Andrew Lutheran Church, Los Angeles)

Introduction

For 16 years California Interfaith Power & Light has been helping congregations put their faith into action and making the switch from fossil fuels to clean energy. Today, houses of worship all over the Golden State are generating power from solar systems or buying clean energy from their local utility company. California faith communities are leading the way toward a 100 percent clean energy future with more than 40 congregations committing to become carbon neutral by 2050 via Interfaith Power & Light's Paris Pledge. Some have even installed electric vehicle charging stations to help their congregants and staff cut their carbon footprints even further.

Over the years we have heard many persuasive discussions for why congregations install solar. Recently, in a conversation with faith leaders, public health professionals and disaster preparedness experts, the value of rooftop solar for congregations became even more abundantly clear. When our neighborhoods are hit by extreme weather and other climate impacts, having a source of power beyond the grid can become a lifesaving asset. A few of our members have already considered this in their decision to go solar.

The purpose of this guide is to give a short overview of energy efficiency; information on solar/photovoltaic (PV) power; and financing for solar tailored to the needs of California congregations.

In terms of solar energy, as non-profits with unique cash-flow concerns, congregations often face challenging questions when investigating the possibilities of installing a PV system. This short guide will share with you some of the experiences of our member congregations in their transitions to solar energy usage. Please note that this guide is not all-inclusive but a good start to shrinking your carbon footprint. In addition, the leadership of specific faith traditions or denominations may have policies regarding solar and other energy efficiency measures, and should be consulted as well before moving ahead with a solar installation.

This guide explores both potential financing options and financial models our congregations are already using. It provides recommendations of solar installers and auditors based on researched, documented, and/or first-hand information. Please note, that while each congregation is unique, you may want to consider a congregant to serve as "project manager" to manage the bidding, sizing and solar installation process at every step of the way.

All of us at California Interfaith Power & Light want to support you and your congregation on your journey to energy efficiency and exploration of rooftop solar. As you consider, plan, and implement energy-saving practices and assess solar options, please call us. We are happy to work with you to address challenges specific to your congregation's situation. Thank you for your commitment to protecting our climate and working for a clean energy future.

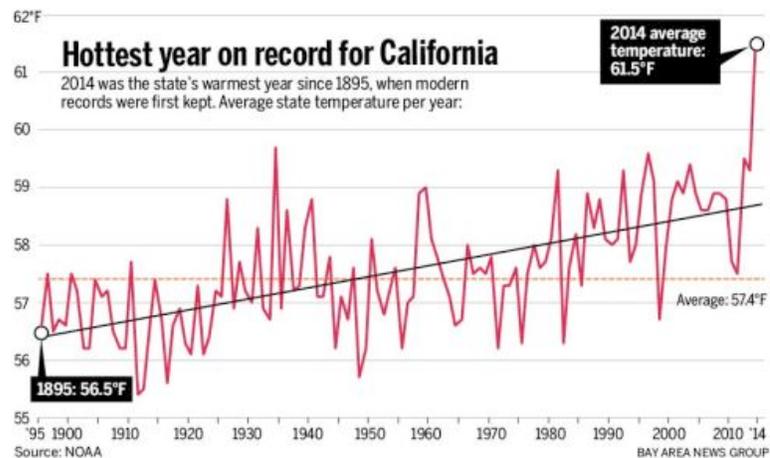
The Faith Case for Being Sustainable...It's More than Money

Often, when a congregation is considering solar and energy efficiency measures, the overriding concern is financial. It is crucial to explore the area of financing and to ensure that the decision to move ahead, especially with solar energy, is feasible. But the conversation ought not to stop or perhaps even start there. There are several other important reasons to make such an investment.

We're in a Global Crisis

As a climate conscious person of faith, you know that the planet is getting hotter and hotter (2015 was the hottest on record and early 2016 has been even warmer), and fellow human beings are already suffering due to extreme weather, sea level rise and contagious diseases. According to the Nature

Conservatory, experts predict that one-fourth of Earth's species will be headed for extinction by 2050 if the warming trend continues at its current rate. As Pope Francis wrote in 2015, "Although the post-industrial period may well be remembered as one of the most irresponsible in history, nonetheless there is reason to hope that humanity at the dawn of the twenty-first century will be remembered for having generously shouldered its grave responsibilities." One house of worship upgrading its lighting, conserving water, and putting solar on its roof wouldn't stop the crisis we are facing, however, thousands working together will lessen the crisis.



Walking the Talk

Implementing energy-efficiency measures and installing rooftop solar can show how your congregation is practicing what it preaches/teaches. Loving our neighbors as ourselves means not harming others by greed, wastefulness, pollution, or environmental degradation. The Torah demands a "tilling and tending" of the garden, while the Prophet Mohammad encourages life-giving actions at all times in the passage, "When doomsday comes, if someone has a palm shoot in his hand, he should plant it." Practicing climate-mindfulness in small and large ways helps us embody timeless spiritual values, promote climate justice and honor the inter-connectedness of all life.

Leading by Example

Our network's founder and president, The Rev. Sally Bingham, has said many times, "There has never been a significant cultural change without religion, going all the way back to the abolition of slavery and the civil rights movement. They were all led by religious voices and the moral authority that comes with it." Religious communities can be reservoirs of hope and resilience in the face of grief and trauma. Congregations are often among the first responders when disaster strikes and provide essential volunteers, resources, trainings and networks. Congregations that have considered their energy use, gone through the many loops and hurdles to installing solar systems or choose to pay a bit more for local clean energy are helping open up pathways to that 100% clean energy future that our common home so desperately needs.

Modeling Climate Solutions in Solidarity with the Global Community

With major events in 2014-15, such as the Peoples Climate March, the release of Pope Francis' encyclical on ecology in June 2015, multiple faith declarations on climate change, and the UN Climate Agreement in December 2015, governments and people all over the world are committed to decreasing the use of fossil fuels with renewed vigor. This solidarity of understanding is leading to practical commitments by major world religions on carbon reduction, green strategies and environmental education. Thousands of congregations and individuals have already signed the Paris Pledge committing to become carbon neutral by 2050, and cutting their carbon footprint in half by 2030. Congregations that have conducted energy audits, upgraded their facilities, or installed solar are well on their way to meeting that commitment to carbon neutrality.



Swami Mahayogananda of the Vedanta Society of Southern California shows off the facility's second solar system placed in 2015. The two systems generate more than 35 kilowatts of clean energy for this busy house of worship.

A Congregational Checklist for Energy Efficiency and Solar

I. Get a baseline reading of your energy use

Before implementing any changes, assess your baseline energy use by using a carbon calculator. To assess your current energy usage, go to **www.coolcongregations.org**. This calculator was designed specifically for houses of worship. It is important to understand your congregation's starting point of energy usage. After behavioral changes and energy efficiency retrofits, you may use the calculator again to compare how much less energy you are using now compared to before. If you are reaching out to a solar company, you may ask them to assess your energy use as well.

II. Recognize energy use patterns and conserve

Energy conservation is the fastest, cheapest and cleanest way to reduce energy. The first step to reducing your energy use (and energy bills!) is to recognize the ways in which you use your energy systems: lighting, heating, water, and air conditioning. Are there ways you could adjust your energy use by using them less often, making sure to turn off lights, and setting your thermostat lower or higher, depending on the season? **It is common that a congregation can lower their energy usage by 5%-15% just through education and conservation.** In fact, Trinity Episcopal Church in Menlo Park, before spending one penny on energy-efficient measures, reduced their electrical consumption by 11%, simply through an awareness campaign that focused on behavioral changes like turning off lights and computers. (Sounds simple, but this is often the most difficult change to implement.)

III. Implement energy-efficiency measures, starting with the lower cost items first.

The second step to reducing energy usage and/or going solar is to reduce your energy consumption through energy efficiency (EE) measures, such as changing out lighting for more energy-efficient CFLs and, ideally, LEDs, upgrading old heating/ventilation/air-conditioning (HVAC) systems, and replacing older refrigerators and dishwashers with Energy Star approved appliances. If you are going to invest in solar, you want to ensure that you are doing everything possible to reduce energy usage, and thus, to size your system correctly. At the same time, you will want to assess possible additional energy needs, such as installing an electric vehicle charging station.

Use the following resources to determine what types of changes need to happen in your house of worship and to start the process of energy efficiency:

1. **Do a self-audit on your facility(ies):** A self-audit may, in some cases, be just as good as a professional audit. This method may work especially if you have a congregational member who is trained in energy issues and who is willing to do the audit with you. Cool Congregations, mentioned above, also has a self-audit form. Go to CIPL's website, www.interfaithpower.org and look under the Resources tab to Cool Congregations to find self-audit forms from IPL/Cool Congregations and Kansas IPL.
2. Your **local utility company** may provide a free walk-through or discount energy audit. Call your local energy provider and ask for the audit they provide to small businesses and be sure to ask for an "in-person" audit.
3. **Get a professional audit:** A professional energy auditing company may give you a more thorough picture of your congregation's energy use in terms of electricity and natural gas. Practice smart consumer habits by asking for references, as well as contacting the Better Business Bureau to check business records.
4. **Energy Star for Congregations:** Due to the fact that, nationwide, there are hundreds of thousands of houses of worship, and they are often large energy-users, the federal EPA began a program called the Energy Star for Congregations. They have a great website, which will give you further information and resources on lowering the energy usage in your congregation, including a workbook specifically for houses of worship. You can also sign up for their Portfolio Manager, which will help you trace your energy usage, and give you ideas for energy efficiency. See www.energystar.gov/congregations for more information.

IV. Analysis of the property and roof for the bid process.

Begin by putting together a Request for Proposal (RFP). This will be sent to various solar companies in your area and they will check out your location, roof and property to determine a bid/proposal for your installation. **Make sure to get at least three bids** and follow up on references from the solar companies. Make sure that prospective installers are licensed and insured by checking with the Better Business Bureau.

V. Other Considerations

1. Financing options – the financing section of this guide offers some overview of various forms of financing. Your congregation will need to make decisions about the best process for your particular situation.
2. Rebates and Incentives –federal tax credits are not available to non-profits/congregations because of their tax-exempt status. As a result, the only structure recognized by the IRS to legally transfer the value of tax benefits is called a "Power Purchase Agreement" (PPA). A

PPA allows congregations to purchase electrons as a service instead of buying equipment. A 3rd party assumes the ownership and production risks and passes the value of the tax credit through to the nonprofit in the form of lower cost power. (For more information, see the Financing section starting page 15.) However, there may be state and local incentives available to you. The Database for State Incentives and Rebates at www.dsireusa.org is a comprehensive source of information on state, local, utility and federal incentives. See page 14 of this guide for more information.

3. Stay in touch with CIPL through your process. We like to keep a record of which congregations are installing solar so that we can provide assistance where possible and share your story with other congregations who are going through the process. You may also want to nominate your congregation for a Cool Climate Award, our annual event in which we honor congregations working to care for the Earth. Contact CIPL's Northern California Outreach Director at 415-391-4214 or Southern California Outreach Director at 310-752-3436 for more information.

How Solar Energy Works

How Solar Energy is Produced: When sunlight hits the photovoltaic cells, direct current (DC) runs to an inverter, which converts the sunlight power (DC) to alternating current (AC) The AC power either flows directly into the building if there is demand or back out to the utility grid. When the electricity is sent back to the utility grid, the electricity meter runs backward, and you are credited for the value of that electricity. Solar equipment is all solid state electronics, which means that there are no moving parts. However, periodic maintenance is still required including occasional panel cleaning and inspections. A monitoring system is also essential to ensure that the system is performing as expected. You don't want to wait until you get a monthly energy bill to discover that there has been a problem and no solar energy was captured for part of the month.

The electricity meter on a solar system measures the system's power production. Solar panels lose about 0.7% of their efficiency every year so that after 20 years they should still be producing at least 80% of their original output.

Net Metering on an Annual Basis: Over the course of one year, your utility company will track the amount of electricity your solar power system has sent to the grid and credit this contribution to offset your costs of purchasing power from the grid when your system does not generate enough electricity to meet your needs, such as during cloudy days or at night. At the end of the year, the utility will factor together how much electricity it provided to you, and compare it to how much your system fed back to the utility grid. If you produced more than you consumed, your bill will be close to zero. If you used more electricity than you generated, you will pay the difference.

Note: Make sure to monitor the amount of electricity you use vs. what is put into the grid on a monthly or more frequent basis. In some cases, you may be using a good deal more than what is put back on to the grid and thus, may experience a large bill at the end of a year. In some cases, it is best to keep up with payments based on your actual use monthly.

Note: Utility rates in some areas have increased steadily at an estimated 6.7 percent per year over the past thirty years. Thus, installing solar will theoretically 'lock' in the rate your congregation pays for energy. Therefore, with rising energy prices, this may prove to be a worthwhile long-term

investment. This is particularly true with a PPA, where the cost of energy is fixed for a 20 year period. This provides predictability and certainty when trying to budget for operating expenses.

Time of Use (TOU) Savings: Electricity is either billed to customers on a flat-rate schedule where electricity costs the same all day, or on a TOU schedule, where cost is determined by the time of day, which can also vary by season. A solar customer on a TOU schedule, producing power at a peak time period, will theoretically ‘sell’ power back to the utility during peak periods (for example, during sunny summer months) at a high rate and ‘buy’ back during off-peak hours (for example, when it is cloudy, or during the evening). The customer gets charged or credited for the value of the electricity when it buys or sells electricity, respectively. Check with your utility provider for additional details.

CIPL Member Testimonials

The **First Congregational Church of Sonoma** adopted an Earth Care Covenant in 2008, charged with promoting the active involvement of the church in expressing its Christian concerns for climate-justice, including the implementation of more sustainable living practices in the daily life of the church, our personal lives and the world. Since then, the Committee has organized educational forums, energy audits, green shopping guides, recycling, water-saving landscape, field trips, and public advocacy for climate-friendly policies.

In 2014, the Earth Care Committee proposed converting the entire church campus of 5 buildings to solar energy. The committee, headed by John Donnelly, solicited competitive bids from several solar contractors. Agreement was reached in early 2015 with SolarCraft to install a 13.2 kilowatt solar panel system. The solar PV system, mounted on the west-facing roof of the Burlingame Hall, consists of 48 LG 275-watt solar panels, and is the first solar array on a house of worship in Sonoma Valley.

The new solar system will generate approximately 17,969 kilowatt hours of energy annually, providing up to \$4,700 in utility savings every year. The system’s solar electric panels will eliminate from the air nearly 6 tons of harmful greenhouse gases annually. The carbon pollution reduced during the next 30 years will be equivalent to planting 6 acres of trees. Overall, the new system will offset 90% of the church’s electricity needs.

In contracting with SolarCraft, the church used a 25-year Power Purchase Agreement (PPA) in order to benefit from the 30% Federal tax credit for solar. Also, with the PPA, no out-of-pocket money from the church was needed up-front. Installation, operation, maintenance, and the delivery of power are in the hands of California Clean Energy of Berkeley via the PPA. After six years, or any year thereafter, the church will be eligible to purchase and manage the equipment if it chooses.

Bright and sunny San Diego is an ideal spot for solar energy. Just ask **First Unitarian Universalist Church of San Diego**’s Trustee Carolyn Woodbury, or former trustee Dave Karpinski. They and the congregation’s Green Team oversaw not only a lighting retrofit, the placement of drought-tolerant landscaping, and several other efficiency measures, but guided the process of financing and placement of their new 290-panel 65-kilowatt system. The system, which became operational in early 2014, was paid for with low-cost loans from congregation members. This

financing method, an ideal option when possible, involved the members making loans to the congregation, at 3% for 5 years and 4% for 12 years – a better interest rate for both parishioners and the congregation than outside financing.

Electricity rates increased over the last two years, which magnified electricity savings by an estimated \$33,000 in 2015. This figure includes the cost of loans, residual bills paid to San Diego Gas & Electricity, and incentive payments from the State of California.

The metal roofs on UU San Diego where the system was placed made installation particularly easy as the panels could be clamped onto the roof seams without requiring any penetration of the roofs. Each panel has a micro-inverter, allowing tracking of output by each panel. The whole system is warranted for 25 years.

“We’re thrilled with the system,” Karpinski says. “With the solar energy offsetting almost all of our electrical need, and reduced demand charges, we have been able to reduce our electric bills by almost 90%.”

After reducing their monthly electrical rates by about 25% through a series of energy-efficiency measures, **Temple Sinai of Glendale** took a serious look at renewable energy. After thoughtful discussion and deliberation, the congregation decided to enter into a lease with Moore Solar. After a capital campaign raised \$25,000 for a down payment, Temple Sinai was able to negotiate a seven-year contract and installed a 30 KW solar photovoltaic rooftop system.

In its first full twelve months, the system produced over 45% of the power the congregation used and saved an average of about \$200 per month -- even while paying the lease and dealing with more extreme heat over that summer. In about 6 years when the lease is paid off, savings will jump to \$850/month, at current rates (and rates tend to rise). Since it was installed in February 2012, Temple Sinai reports saving over 128,000 pounds of CO2 as well as many pounds of other harmful pollutants such as sulfur and nitrogen oxides.

The **Vedanta Society of Southern California (VSSC)**, located in Hollywood has greened its buildings as a way of living out the Hindu belief that the earth, like all of Creation, has a spiritual life force and must be protected. Before going solar, carbon-reduction and water-saving measures were put into place in all eight of Vedanta’s buildings including LED lighting in the Main Shrine Temple; increased insulation; the installation of low-flow shower heads and faucets; Xeriscaping; and drip irrigation around the facilities.

VSSC has installed their second solar PV system. The first system, a 7.3 kW rooftop system was installed in 2012. The second PV system, initially configured as a solar carport (to provide dual use: electricity production and shaded area for the cars) was revised to roof-top installation owing to high cost of civil and structural engineering costs that made the solar carport uneconomical.

The second rooftop solar PV system is a 28.45 kW system comprising 87 modules each with 327 watts capacity. Annual production is estimated to be 35,190 kWh that will meet a substantial portion

of the monastery and temple's electricity requirements.

VSSC invited proposals from three solar companies and selected Xero Solar Company of Manhattan Beach, CA. VSSC chose to purchase their second PV system (the first one is leased from Solar City) and nearly a third of their initial investment was immediately defrayed by the rebate offered by Los Angeles Department of Water and Power.

Contract signing to LADWP switching took six months, of which 2 months were taken up by evaluation of roof condition and hiring a roofing company to apply special coating. The system was activated in September 2015. LADWP's billing procedure for customers with solar PV systems appears to have been revised. There were instances of billing errors that now appear to have been corrected. VSSC has seen reduction in energy purchased from LADWP and the corresponding reduction in monthly bills as well.

Kehilla Community Synagogue in Oakland had much to celebrate when they installed their 22-kilowatt solar system in 2014. It is expected to produce almost three-quarters of the electricity used by its Grand Avenue building, and save \$150,000 in the long run. Kehilla partnered with Re-Volv, which uses a donation based crowd funding model to raise funding for solar installations for non-profit and community organizations. \$56,000 was raised for Kehilla's system, making a 20-year lease payment very reasonable. In addition, Kehilla's monthly payments allow Re-Volv to support additional solar installations.

So far, the congregation's PG&E bills have dropped from an average of \$600/month to \$75/month after the solar installation. When adding in the cost of the panels, Kehilla now pays \$175 less per month for energy than before.

Kehilla's solar system is emblematic of the congregation's work of "Tikkun Olam" – repairing the world. Their Greening Committee members cite action for the future, protection of all life, and social justice advocacy as key tenets of their faith, and the use of renewable energy is one action that puts these principles into action.

On the importance of embracing love for all of Creation, Rabbi David Cooper of Kehilla Community Synagogue states, "Society has to shift into respecting not only the lives of people. At stake are the lives of species, as well. This is the generation that has to turn it around."

St. Andrew Lutheran Church in Los Angeles is well known for its environmental commitment. It is a model of energy-efficiency and resource protection for parishioners, the surrounding community, and the large number of groups it hosts on a weekly basis. Long before the idea of solar energy came up, St. Andrew's was a green campus, complete with various energy-efficiency lighting; a Xeriscape low-water garden with native California plants; drip irrigation; and a vigorous recycling program, among other measures.

Two years ago, St. Andrew's Green Team and Pastor Caleb Crainer, who grew up in Kansas with a love for nature, made the journey to solar energy. Their 9.6-kilowatt solar system, which came on

line in February of 2014, was the crowning achievement of their energy reduction measures. The solar company used was Solar Forward, and the financing method was simple: St. Andrew made an internal loan for the system from their building maintenance fund and are repaying the loan from their saving.

Even with this full complement of energy efficiency, St. Andrew is in the final process of creating a campus master plan that will involve many further enhancements to the facility, such as eco-turf that is safe for kid's play, and won't require additional watering and additional ways to reduce water usage.

After two years of research and planning, **Montclair Presbyterian Church in Oakland**, known for its history of strong environmental advocacy, installed 66 new solar panels on its roof in 2014. The project was a way for Montclair to walk the environmental talk, and put climate solutions into action at their own facility. The church sits on the banks of Temescal Creek, surrounded by native plantings, and with the solar panels the church now demonstrates its ecological awareness from foundation to rooftop.

The panels have offset an impressive percentage of electricity used on the church campus. The \$75,000 project was made possible by initial gifts totaling more than \$50,000 from members of the congregation. For this 250-member church, the cost of the panels represents a considerable financial commitment. But Montclair Presbyterian's members have shown that galvanizing individual commitments is what makes a large project like this possible. The church's very capable and long serving Earth Care committee spearheaded the solar installment.

Montclair Presbyterian Church is NOT resting on its solar laurels. It remains very active in efforts aimed at reducing climate change on the local and national levels. The church brought forth an overture in September 2015 requesting that the National Presbyterian Denomination divest from all fossil fuel investments. This proposal will be voted upon in June 2016. The church is also currently involved in the multi-coalitional effort to halt the building of a coal export terminal at the Port of Oakland.

When the **Center for Spiritual Living, San Jose (CSLSJ)** explored renewable energy options, they knew they wanted to involve the community and engage them in every aspect of the project, including financing. Going solar was not only a way to express CSLSJ's commitment to creation care and the environment, it was also a way to create community engagement using CollectiveSun's proprietary crowd lending platform. To build the 24kW system, a total of 88 community members invested between \$25 and \$10,000 each to fund a system costing \$117,000. Over the life of the system, CSLSJ's PPA is expected to save over \$270,000, including tax benefits that were utilized by CollectiveSun and passed through to the congregation in the form of lower energy costs.

CollectiveSun, which works exclusively with nonprofits to help them go solar, offers a less expensive option for going solar than a typical bank or solar financing institution because their unique platform leverages the power of a nonprofit's own community and membership base to make an investment, not a donation, with the full amount being repaid to the investors with annual principal and interest payments.

As most of the current solar incentives are encapsulated within the tax code, nonprofits are not eligible to receive them unless they utilize a PPA. In addition, it is difficult for many congregations to get a traditional bank loan. Todd Bluechel, CollectiveSun's VP of Marketing and Sales said, "We saw this challenge as an opportunity to connect impact investors, investors who invest in cause related opportunities, with nonprofit organizations like the Center for Spiritual Living that need to raise funds to develop solar projects. By bringing these two groups together, we find not only are we able to fund these projects but, more importantly, we're able to engage more people, creating both financial and non-financial supporters."



Temple Sinai of Glendale celebrated its placement of solar with a special blessing, complete with solar prayers and solar songs for children.

Incentives for Installing a System

****Check with your local utility provider and installer for a more complete understanding of rebates and incentives available.**

Federal Tax Credits: There are several government incentives to promote the use of solar energy in commercial, industrial, and residential systems. Unfortunately, those that are tax-based incentives do not benefit religious organizations, due to their tax-exempt status. Thus, nonprofits **are not directly eligible for federal tax credits** or the federal tax grant.

A comprehensive list of federal incentives and state programs can be found at the website:

www.dsireusa.org

State Tax Rebates: California has offered solar rebates as part of its California Solar Initiative, administered through utilities. Unfortunately, this rebate has been completely exhausted and is no longer be available for commercial buildings (including houses of worship).

The Go Solar California website provides California consumers a "one-stop shop" for information on solar programs, rebates, tax credits, and information on installing and interconnecting solar electric and solar thermal systems. It even includes a "Consumer Alert" with tips on how to avoid being pressured by a less-than-reputable solar company. Currently there is no section for nonprofits but

CollectiveSun is working with them to update their website and include information specific to nonprofits and places of worship. Check out their website at www.gosolarcalifornia.ca.gov.

Local Incentives and Rebate Programs: Many local municipalities have similar incentive programs; it would be impossible to list them all here. For a comprehensive listing, check out www.dsireusa.org and click on California on the map to see all of the current local programs.

Many local incentive programs have great components in which you can get several thousand dollars back for employing graduates of green job programs. These local incentives not only add up to significant savings, they also help fulfill congregational goals of social justice. Check out www.dsireusa.org and get in touch with your city and county government staff to find out more.

Financing Your Solar Energy System: Models for Non-Profits

Purchase

For those congregations in the position to have “money in the bank” whether from savings and/or bequeathed, they may purchase a system outright. Our Lady of Guadalupe Church in Hermosa Beach was able to retrofit buildings and place a 65-kilowatt system on their facilities through this method. Purchasing a system outright through donations, grants or savings vs. loans or PPA’s is mandatory for some congregations, such as those in the Los Angeles Catholic Archdiocese, which does not allow multi-year loans, leases or PPA’s.

Sponsor a Panel

This is a form of financing that is being used more often, in which members of the congregation buy a full or partial solar panel. Plaques or memorials to family members involved in the congregation may encourage participation in such fundraising campaigns. This model has been used successfully, most recently at Claremont United Church of Christ to finance their 49-kilowatt system, installed in 2013.

Refinance a Mortgage

This model draws from the example of Christ the King Lutheran Church, where a congregation refinances the mortgage on their building and uses the freed-up capital to invest in a solar system. The longer payoff on the mortgage increases cash-flow for the congregation to use for other programs, and the energy savings may, in fact, pay for the repayment on the refinanced mortgage.

Solar Lease Financing

Some solar companies offer the option (based on a successful credit check and a series of other prerequisites like system size, etc.) of leasing the solar system back to a congregation. Under this model, the solar installation company pays for the upfront capital required to install and maintain the system, and the congregation pays a fixed monthly price to the solar installer over the course of the lease agreement. This protects the congregation from the inevitable annual increase in energy costs. It is important that the system be sized correctly so that the congregation is not paying a large power bill to its utility in addition to the lease payment to the solar installer. An increasing number of member congregations have installed solar through a lease program and CIPL staff will be able to

refer you to contacts at these congregations. See the list of solar installers for those that offer lease options. Note that a solar lease option results in the loss of all tax benefits since a lessor cannot claim tax benefits on a lease to a nonprofit.

Power Purchase Agreements (PPAs)

A Power Purchase Agreement (PPA) is a contract between a solar power company (often involving a group of investors) and a congregation, in which the solar power company installs and owns the system, and the congregation agrees to buy the electricity generated on a monthly basis over the long term. Essentially, a house of worship is able to pay for solar as a service, rather than paying the high upfront costs of the solar panels themselves. Under a power purchase agreement, the solar power company is responsible for providing the upfront capital to fund the installation of the solar array. It serves as the owner-operator of the system, covering insurance and fees for operations and maintenance (including inverter replacement), and offers a money-back guarantee that the system will produce the contracted amount of electricity over the long term. The solar power company bears all the risks of ownership including the production risks (ensuring the system provides the guaranteed kWh) as well as the warranty risks. If the solar installer or equipment manufacturer goes out of business and doesn't honor their warranties, the nonprofit is protected because the solar power company is still responsible for delivering the kilowatt hours. The solar power company receives the federal investment tax credit (ITC) and accelerated depreciation as a for-profit entity, and is thus able to pass on significant savings to the congregation over the long term vis-à-vis an outright system purchase, a lease or low-interest financing, where the ITC and depreciation cannot be utilized by a non-profit entity.

Crowd Sourcing:

A growing financing method for congregational solar is a type of crowdsourcing, in which individuals make donations or investments to a specific community solar project or a general fund that allows for community solar projects.

Crowd Sourcing Donations

An example of donation based crowd sourcing is RE-volv (revolv.org) based in San Francisco. Re-volv is a CIPL partner and recently worked with Kehilla Community Synagogue in Oakland on their solar system. Re-volv went to the community and asked for donations that were used to fund the solar installation costs. Next, Re-volv entered into a 20 year lease with the synagogue. Under a lease model, neither Re-volv nor the synagogue were able to utilize the tax benefits.

Crowd Sourcing Investments

Another crowd sourcing option is an investment-based model. Instead of going to community members and asking for donations, community members can make investments in a project for their nonprofit and receive annual principal and interest payments back. CollectiveSun is a CIPL partner that recently worked with Brea Congregational United Church of Christ and First Baptist Church of Yucca Valley who both went solar by asking community members for loans using the CollectiveSun platform. Since this investment based community funding model utilizes a PPA, the tax benefits are

passed through to the nonprofit in the form of lower energy costs. In addition, a 3rd party is responsible for all monitoring, operations, maintenance and repairs (including inverter replacement).

Property-Assessed Clean Energy (PACE)

PACE is a federal program in which a homeowner or small business may be eligible to borrow money and repay the loan over twenty years via property taxes. An increasing number of entities are taking advantage of this type of financing, which places a first priority lien on the property. Check out the Center for Sustainable Energy's website link on various PACE programs throughout California to learn more <http://energycenter.org/policy/property-assessed-clean-energy-pace>.

Solar - Central to California's Renewable Energy Transition

Solar Policy

As of January 2016, California State remains the leader in the nation in renewable energy, energy efficiency, and conservation, with CIPL a strong and active supporter in the passage of legislation aimed at these. In terms of solar energy expansion, Senate Bill 350, passed in 2015, legislates that California will procure 50% of its electricity from renewable sources by 2030, in addition to increasing energy efficiency in buildings by 50% by 2030. Senate Bill 43, passed in 2013, allows customers of PG&E, SCE, and SDG&E to purchase up to 100% renewable electricity for their home or business.

Community Solar

Community Solar allows customers who are unable to obtain solar for themselves because of finances or shading issues on their roof to buy solar from local solar projects, via the three main investor-owned utilities, that range from 0.5 to 20 megawatts. This option is the implementation of SB 43 mentioned above, and in January 2015, Pacific Gas & Electric was the first California investor-owned utility to receive regulatory approval to start the program. PG&E planned on starting this program in the last quarter of 2015, with Southern California Edison (SCE) and San Diego Gas & Electric due to come on line with their respective programs in late 2015/early 2016.

Community Choice Aggregation

Community Choice Aggregation (CCA) allows a municipality to purchase renewable electricity on behalf of customers, instead of relying solely on investor-owned utilities (such a PG&E) to procure and deliver energy. This way, a CCA is able to obtain cleaner, and sometimes more affordable, energy. Existing CCA's are in Northern California – Marin Clean Energy (mcecleanenergy.org), Sonoma Clean Power (sonomacleanpower.org), CleanPowerSF (cleanpowersf.org) starting in 2016. Alameda County is currently conducting an analysis in order to start a CCA. Some CIPL member congregations are in CCA territory and are able to take advantage of renewable electricity, such as Spirit Rock Meditation Center in Woodacre.

A Word About Electric Vehicles and Charging Stations

Our Golden State is not just a leader in solar power. Recent policies supporting reduction of harmful carbon pollution from vehicles has created a cleaner-vehicle revolution. In 2014, the companion bills of SB 1204, focused on cleaner trucks, and SB 1275, aimed at having 1,000,000 zero and near-zero emission vehicles on the road by 2023, passed into law.

To facilitate the new electric vehicle revolution, California is focused on expanding its EV Charging Station super-highway. From urban areas to more rural highways, “range anxiety” is being combatted with a rapid increase in EV charging stations at supermarkets, governmental centers and now, houses of worship. For a list of EV charging stations and a handy way to map out a route, see http://www.afdc.energy.gov/fuels/electricity_locations.html.

One CIPL member that has a charging station on site is Unitarian Universalist Church of Palo Alto. So far, the cost of electricity to the congregation has been paid for by donations received for its use. A specific guide is currently in development to assist congregations on various ways to support electric vehicles.

Financing for Low-Income Home Owners – GRID Alternatives

The vision of GRID Alternatives, one of CIPL’s partners, is “a successful transition to clean, renewable energy that includes everyone...and to make renewable energy technology and job training accessible to underserved communities.”

GRID’s vision and mission align with many commonly-held faith principles, and recognize that working with under-served communities is not charity but a matter of justice. A rapid shift to renewable energy; job training and placement, especially in areas hard-hit by unemployment; the inclusion of all communities in clean-energy solutions; and public health improvement are all crucial to a shift to more equitable and healthy communities.

With the use of the Cal Enviro Screen, a tool that highlights California communities most hard-hit by pollution sources and under-served financially, GRID Alternatives places residential solar systems free or at very low cost. These systems dramatically reduce electric bills to the homeowners, freeing up vital financial resources for educational, housing and living expenses.

For more information, see www.gridalternatives.org. To speak to someone directly for more information or to see how you can support their work, contact Miguel Reza, Director of Outreach, (619) 610-0168 or mreza@gridalternatives.org.



Rev. Reginald Hansome of Ascension Lutheran Church, Los Angeles, delivers a blessing on a newly-installed PV system by GRID Alternatives, at a press conference in Willowbrook in May 2015. GRID workers, CIPL staff member Allis Druffel, and Jason Wimbley of the California Department of Community Services and Development are present.

Improving efficiency and saving money through demand response

Demand response is about reducing electricity consumption during the times of day when it is most in demand. Demand response programs in California directly offset a utility's need to generate electricity with inefficient and "dirty" peaker plants. By enrolling your facility into a demand response program from a California based utility, you are directly offsetting the highest portion of greenhouse gasses produced during electricity generation.

A company that has worked with a number of congregations to lower their bills through demand response is THG Energy Services. THG's Energy Intelligence Suite can cross-reference your power savings with EPA carbon dioxide emissions per generating zip code for you to quantify exactly how much greenhouse gases you prevented from entering the Earth's atmosphere.

THG can typically make a program work if the customer is able to curtail demand (kW) in the 50 kilowatt ballpark. That means your energy bill is likely \$8000 a month or more. With the Technical Incentive funds available California, THG can even dip down lower than 50 kW and still make the program work. It is very easy for THG to analyze your utility bills at no charge to determine whether or not you are able to enroll in a demand response program and benefit from the cost and greenhouse gas savings.

IPL is happy to partner with THG to make these savings more accessible to member congregations, and by signing up through California IPL, we will get a donation from revenues THG generates to cover their costs. The majority of THG's business comes from energy intermediaries, retail electric providers, suppliers, local governments, Energy Service Companies, sustainability organizations, and consultants. THG will provide all onboarding, 24-months of historical data for each account, portal

training, and ongoing support for all IPL participating members. For more information, contact Jim Westover at jwestover@thgenergy.com.

Referrals - Solar Installation and Auditing

The following companies have worked directly with CIPL congregations and/or come highly recommended. Ask about solar financing and/or leases offered.

Solar Installation:

Altadena Energy & Solar LLC – San Gabriel Region
Hans Rosenberger, (818) 201-4206, hans.rosenberger@altadenasolar.com
www.altadenasolar.com

Golden Gate Power - Bay Area
Noah Cooms, (808) 220-2177; main (800) 463-8122, ncooms@goldengatepower.com
www.goldengatepower.com

Luminalt Solar – Bay Area (Grace Tabernacle, San Francisco; First UU San Francisco)
Jeanine Cotter, (415) 641-4000; mobile (415) 740-8082; email: Jeanine@luminalt.com
www.luminalt.com

Moore Solar & Green Construction – Greater Los Angeles Region (Temple Sinai of Glendale)
Veronica Zerman, (323) 221-1260; mobile (213) 760-3820; email: vzerman@mooresolar.com
www.mooresolar.com

American Solar (Pacific Green Energy) – East Bay/Bay Area but is happy to refer to SunPower dealers throughout the state – current partnership with the Episcopal Diocese of California, call for packet (St. James Episcopal Church, San Francisco, others)
Charlie Gregg, (415) 942-3106; Charlie.Gregg@americansolar.net
www.AmericanSolar.net

Run On Sun - Los Angeles Area (Westridge Academy, Pasadena)
Jim Jenal, CEO, (626) 793-6025; jjenal@runonsun.com
www.RunOnSun.com

SolarCraft – Novato and surrounding areas; (First congregational Church of Sonoma)
Robert Gould, Director of Commercial Sales, (415) 382-7717; Rgould@solarcraft.com
www.solarcraft.com

Solar Forward – Los Angeles area (St. Andrew Lutheran Church, Los Angeles)
Andrew Hoesly, Sales Manager, (707) 239-1220; Andrew.hoesly@solarforward.com
www.solarforward.com
Includes children's guide to solar power - http://solarforward.com/solarkids/what_is_a_watt.html

Solar Richmond, East Bay – Synagogue Kol Shofar, Marin (Tiburon)
Cheryl Vaughn, Cheryl@solarrichmond.org, (510) 253-2211
www.solarrichmond.org

Stellar Solar – San Diego; (First UU Church of San Diego)
Michael Powers, mppowers1@cox.net, (619) 778-8443
www.stellarsolar.net

Sun Light and Power – East Bay (Tassajara Zen Mountain Center and St. John's Oakland) - lease
Jesse Quay, (510) 809-3681; jesse@sunlightandpower.com
Kristin Broussard kbroussard@sunlightandpower.com social media and marketing coordinator
www.sunlightandpower.com

SunPower Corporation – statewide
Cynthia Khatib, (415) 715-4994; email cynthia.khatib@sunpowercorp.com
www.sunpowercorp.com

Xero Solar – Southland (St. Anthony High School, Long Beach and American Martyrs, Manhattan Beach) – the only solar contractor approved for the Los Angeles Catholic Archdiocese
Ben Lochtenberg, President, (310) 376-8740 – office; (310) 200-1713 – cell
www.xerosolar.com

Residential Solar:

Sungevity – (worked with Catholic Diocese of Stockton for parishioners' residences) – home and business – with a referral from CIPL that results in placement of solar, includes an incentive of \$750 to homeowner and \$750 to CIPL
Andy McElroy; (510) 740-2714; amcelroy@sungevity.com
sungevity.com

Solar City (several houses of worship) offers incentive for both homeowner and CIPL
Toby Session, Field Energy Consultant; (916) 274-9573; tsession@solarcity.com
solarcity.com

Solar Financing:

CollectiveSun – investment based crowd-funding for nonprofits to obtain PPAs - nationwide (Center for Spiritual Living, San Jose; Brea Congregational Church; First Southern Baptist Church of Yucca Valley; Rocky Mountain Institute, CO) – crowd-funding as investment model
Todd Bluechel, VP Marketing and Sales, (858) 480-9342, email: lbarken@collectivesun.com
www.collectivesun.com

GroupEnergy - statewide – works with large groups of homeowners to bundle solar packages
Kevin Armstrong, (510) 350-3734, email: kevin@votesolar.org
www.votesolar.org

RE-volv - Bay Area – donation based crowd-funding to finance solar systems in congregations and community centers
Andreas Karelis, (415) 314-7719, email: andreas@re-volv.org
www.re-volv.org

Solar Mosaic – Bay Area – connects investors to solar projects in need of financing

Billy Parish, (203) 887-7225, email: billyparish@gmail.com
www.joinmosaic.com

Village Power Finance – statewide – aggregates congregants and third-party investors for solar
David Simpson, Chief Operating Officer, (415) 570-1011, email: dsimpson@villagepf.com
www.villagepowerfinance.com

Wiser Capital – statewide - evaluates solar potential and explores investment and payment methods
Stephen Honikman, (805) 899-3400, email: sch@wisersolar.com
www.wisercapital.com

Auditors:

Peralta Energy Group - Oakland (St. Mark's Episcopal Church, Berkeley; First UU Church, Oakland)
Ben Thompson (510) 459-0827
www.PeraltaEnergy.com

The Building Doctors - Los Angeles (Mary Immaculate Church, Pacoima)
Dan Thomsen, (323) 646-2534
www.thebuildingdoctors.com

Related Resources:

Balanced Projects, Real Estate & Project Mngmt Services (Our Lady of Guadalupe, Hermosa Beach)
Rick Lopez, mobile (310) 614-2719; rickwlopez@hotmail.com
www.balancedproj.com

Center for Sustainable Energy, resources and information on a wide variety of energy-efficiency measures, including solar and transportation
(858) 244-1177; www.energycenter.org

By Dave Troesh
77 Ways to Save Money and Energy at Your Church or School – handy for all houses of worship
300 Ways to Save Money and Energy In Your Home, available in both English and Spanish

Golden Gate Electric Vehicle Association – a non-profit organization supporting electric vehicles
Dale Miller, President, dalewmiller@gmail.com
www.ggeva.org

REV – (Worked with the San Diego Catholic Diocese) – provides education and tools that integrate the best of sustainability with behavior change to accelerate energy efficiency impact. Check out their Sustainability Circles program.

Mike O'Brien, Director of Sales & Business Development – San Diego (call for referrals to other areas); (619) 807-4758; mikeo@revsustainability.com
revsustainability.com