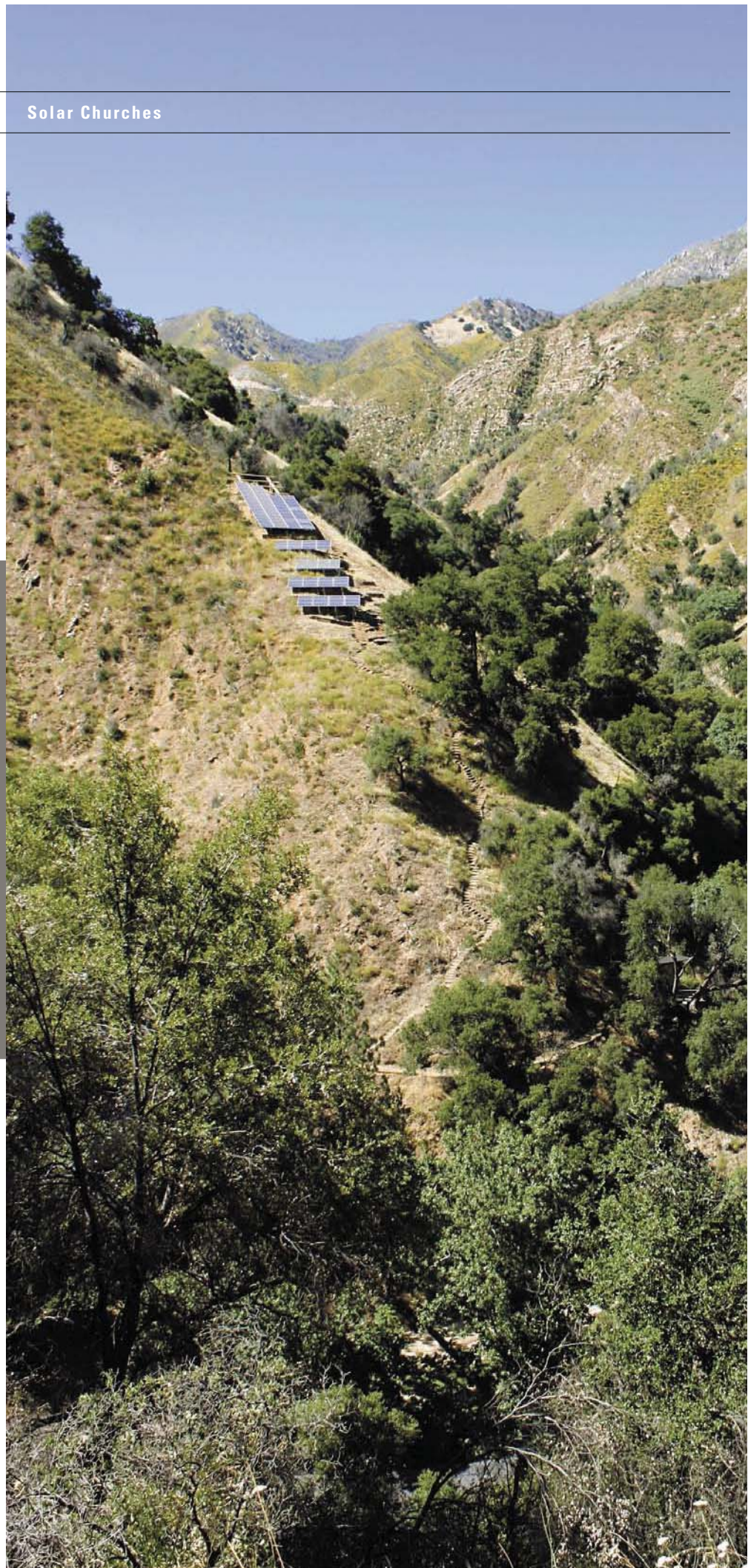


Spurred on by a desire to preserve God's creation, an increasing number of Jewish, Muslim and Christian houses of worship have adopted solar. For many, it takes an extraordinary effort to translate a faith community's commitment to »creation care« into installing an actual PV system. Many obstacles, primarily financial, stand in the way, yet creative solutions and perseverance are making it possible.

For so many reasons, the decision by the San Francisco Zen Center to install solar to power its Tassajara Mountain Center was simple. Located in a ruggedly beautiful spot amidst California's Santa Lucia Mountains, just inland from Big Sur, Tassajara serves as both a winter monastery for monks and as a resort open to the general public in the summer.

Committed to solar: Nothing about the installation of the 21 kW photovoltaic system at the Tassajara Zen Mountain Center near Big Sur, California was easy. But the Zen Buddhists who did it felt it was worth the effort.



God's original energy source

More and more mosques, churches and synagogues are embracing PV

But the qualities that make Tassajara the perfect idyll for quiet contemplation and relaxation – it sits at the end of a steep, winding, inhospitable road, the last 23 km of which take an hour to traverse by automobile – also mean that options are limited when it comes to supplying power to the refrigerators, lights and other simple amenities the retreat offers visitors. In the past, the enclave, which is not connected to the electric grid, relied on a diesel generator for its power needs, though truck drivers were less than thrilled with the task of hauling 200

l drums of diesel down a treacherous road.

Obviously, living far away from the power grid has been a driver of solar installations for a long time, so its remote location instantly made Tassajara a good candidate for photovoltaics (PV). But logistics and practicality aside, the impulse to utilize the power of the sun to meet the electricity needs at the Zen retreat was driven largely by the religion's philosophy and worldview. »Our ethos is to live lightly on the earth. The way it expresses itself is in our relationship with the environment



Looking upwards: The 21 kW solar system at the Tassajara Zen Mountain Center is located 90 m above the compound's buildings.

through water, energy, waste, social action and food, those five general areas,« says Simon Moyes, chair of the San Francisco Zen Center's Environmental Committee.

As if that overarching philosophy about having minimal environmental impact – which is also paired with strong convictions about the interconnection and interdependence of all people and beings – were not enough to lead Tassajara to ditch diesel for photovoltaics, then its location provided whatever additional motivation was needed. »Everything we use has to come over that road and all the waste we produce has to go back out over that road. It's a way of becoming very clear about the resources we are using,« says Moyes.

Over the past 4 years, in order to reduce the amount of resources used, the Tassajara Zen Center incorporated a host of measures – including eliminating the ice machine and upgrading to more energy efficient lighting and fixtures – which allowed it to reduce its total daily energy use from 120 kWh to 85 kWh. With that effort complete, the Zen Center opted to go big with solar by upgrading a system that started many decades ago with just a few panels to a ground-mounted 21 kW array, which is sufficiently large to supply 100 percent of Tassajara's electricity needs. With a new building set to be added to the compound and unknown future energy needs, Moyes says that the PV system was designed in such a way that extra panels can be added if they're needed in the future.

Divine inspiration

If your initial reaction is that the news that a facility operated by California Zen Buddhists has opted for solar energy is hardly worth a mention – the environmental emphasis of the faith is well-known and includes such measures as eating local, organic produce – it's important to note that their decision to install PV is part of a larger trend amongst various faiths. Indeed, from places in the Bible Belt like Arkansas and Georgia, to the Midwest to the West Coast, Christian, Muslim and Jewish congregations have opted to tap the sun for their energy needs.

Although there are obviously differ-



The Lord's work: Workers install part of the 17 kW PV system at the St. John's Episcopal Church in Oakland, California.

California Interfaith Power & Light

ences in the belief systems of different traditions – which far too often translate into conflict, sometimes violent – there are certain believers amongst different religions who say that their faith demands them to be environmentally conscious. »It's our moral responsibility to care for creation,« says Alexis Smith, the executive director of Georgia Interfaith Power & Light, a national organization that helps congregations in their efforts to improve energy efficiency and adopt renewable energy. »In Georgia, our energy is mostly from coal, and mostly from mountaintop coal mining. We connect our faith traditions with the idea that we need to stop using polluting forms of power and switch to God's original energy source, which is the sun.«

That impulse to seek what one might call a holier source of energy was the main factor in driving Holy Trinity, an Episcopal church in Decatur, Georgia, to install a 4.7 kW PV system on their parish hall. William Deneke, the former rector of the parish, says that the Holy Trinity community has a long tradition of being committed to environmental issues and that a group of parishioners charged with setting priorities for the church put green initiatives very close to the top. Working with Georgia Interfaith Power & Light, which offers zero-interest loans of up to \$15,000 to churches going solar, Holy Trinity raised the additional amount needed to install its PV system, which Deneke says serves as an

important symbol to other churches and residents in their suburban Atlanta community. »Where we put the panels is very visible. It can be seen and is testimony to green energy,« says Deneke, who presided over a ceremony, blessing the panels when they were installed. »We wanted to give witness to solar power and be an example.«

For all of the church members interviewed for this story, it's not difficult at all to find direction in either their most sacred texts – be it the Bible or the Koran – or the traditions of their faith to have the sort of environmental consciousness that leads to the installation of solar. »It is Biblical to be 100-percent efficient and use the resources God has given us to the best of our abilities, whether that's rotating crops or putting solar or wind on a facility,« says Jon Gray, the technical director at Grace Community Church in Fort Smith, Arkansas, which installed a 17 kW system in 2010. »That is a no-brainer, and it's scriptural.«

For other faith communities, emphasizing their green bona fides is also a way to try and ensure their longevity in the face of, at least in some areas of the country, declining church attendance. »I think solar is a great visible way for a congregation to show its concerns about impacts on the environment and climate and a way to show that it's modern and thinking and appealing to younger parishioners,« says Susan Stephenson, executive director of the California In-

terfaith Power & Light chapter, one of 38 state organizations around the nation, whose group has assisted around 30 congregations in going solar.

Of course, all believers of all faiths do not accept this conviction that it's imperative to protect God's creation. Indeed, anyone who has followed the debate over what, if anything, to do about climate change knows that certain Evangelical Christians stridently and vocally deny the existence of manmade global warming. In more general terms, many conservative Christians interpret the Genesis chapter of the Bible in a way that grants humans dominion over God's creation, rather than as an admonition to protect it. In fact, it was the strong influence of this line of thought that started members of the St. John's Episcopal Church in Oakland, California, on a path that ended in them installing a 17.8 kW solar system just over a year ago.

Over a decade ago, congregation members launched a study group to discuss environmental matters and how they related to the obligations of their belief system. »We were aware that a lot of environmental people were looking to church organizations with some scorn because we represented an element that was dominating the earth, per Genesis,« says Robert Davidson, a member at St. John's. But through their own study of the Bible and other teachings, Davidson says his group came to very different conclusions, which prompted the church to implement a host of measures to improve energy efficiency and eventually install the solar system. That said, even at a newly solar-powered St. John's, skeptics remain. »There are probably as many as half the people who don't believe in global warming and think we have a role and responsibility to use the resources God has given us,« he says. »They hold a different posture, but they still feel that so much of what we are about and what we do is valid and is of value that we haven't gotten any pushback on moving forward with solar.«

Economic challenges and solutions

For religious groups interested in going solar, deciding whether doing so meshes

with their philosophy and worldview is just one important question to answer. Like any other homeowner or organization grappling with limited budgets, economics and affordability are also paramount. That said, as nonprofits with a mission that transcends the financial, some churches are willing to make judgments about payback and return on investment that others couldn't. »Once you move into the realm of ›it's the right thing to do‹ instead of doing it for money, then the money becomes a much less relevant piece of the equation. Then it's a matter of figuring out how to do it at the lowest reasonable cost,« says Gary Gerber, the President of California-based Sun Light & Power, whose company has done numerous installations at houses of worship over the years. »Does it need to pay for itself in 2, 5, 10 years if the church has been there 50 years? The fact that it will pay for itself is sufficient and it's fulfilling one of the missions of the church.«

But even with a more relaxed perspective on financial return, churches face a more challenging task than other institutions in lining up enough money to pay for a solar installation. As nonprofits, religious organizations cannot take advantage of either the all-important 30 percent federal tax credit that has spurred so many businesses to go solar or federal depreciation benefits. Gerber says that it's also more or less impossible for churches and other nonprofits to get financing from outside investors offering leases or power purchase agreements. »There is leering around churches because, although they may be part of an institution that is bigger and hugely wealthy, there is a strict separation maintained between a local organization and a worldwide one. Which is why you see individual churches go bankrupt while an affiliated faith is one of the wealthiest on the planet,« he says. »The money people, being money people, don't have the motivation of stewardship or faith. Their motivation is protecting their investment and it's considered high risk.«

These financial obstacles are enough that even in places like California, where the state's upfront rebate through the Cali-

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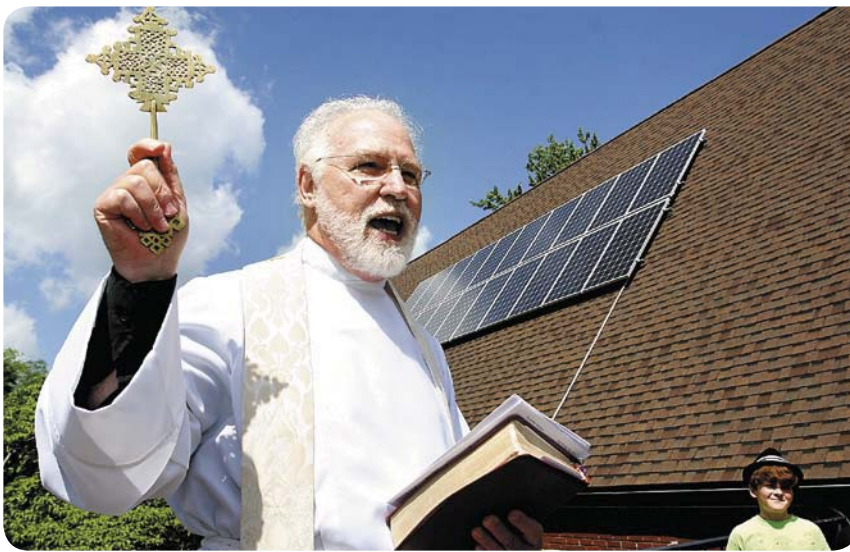
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Sacred system optimization: William Deneke, former rector at the Holy Trinity Church in Decatur, Georgia, presides over a blessing of the panels ceremony.

fornia Solar Initiative is 75¢ per W higher for nonprofits than for commercial systems, religious organizations still need to scramble to make it work. In some cases, a little bit of generosity helps out. »We had a gentleman who donated the majority of the panels and all we had to pay for was the infrastructure and the installation,« says Jon Gray of Grace Community Church in Arkansas. With donated panels and a generous, albeit temporary, state production-based incentive, Gray estimates that the investment will pay for itself in just a couple of years.

Not all churches, of course, are so fortunate as to have a benefactor who will donate panels. In those instances, churches turn to their congregations for fundraising, in some cases offering individuals the opportunity to »sponsor« a single panel with a donation. Holy Trinity in Decatur, Georgia, utilized a mixture of methods to raise the necessary money for their \$36,000 system. Bill Clark, a member of the church, and an architect by trade, was involved with making the church's desire to go solar a reality. He says he was nervous about the kind of response a solar fundraising drive would receive amongst the other members. He needn't have been too concerned because Holy Trinity members quickly contributed \$22,000, and the remainder of the price tag was covered by a

zero-interest loan from Georgia Interfaith Power & Light. In order to pay back the loan, Holy Trinity will tap the money it earns through energy savings thanks to the solar system. Clark says the church is paid around 17¢ per kWh by the local utility – typical retail rates are in the 9¢ range – and the savings accrued over the year amounts to about \$1,200, meaning that it will take around a decade to pay off.

When the entire congregation at a church isn't willing to come up with the cost of a system, there have been cases where two or three parishioners will form a limited liability company to fund the solar install. This has the advantage of removing the nonprofit status of the church, enabling the newly formed company to take advantage of the federal tax credit. But it has the disadvantage of being complicated from a tax and accounting point of view. »It's a little complicated and intimidating if you're not a CPA or don't have one on staff,« says Stephenson of California Interfaith Power & Light.

A leap of faith

A large number of the more notable buildings in the world are religious in nature, be it Notre Dame Cathedral in Paris, France, or the Hagia Sophia Mosque in Istanbul, Turkey, or St. Peter's Basilica in Rome, Italy. Obviously, most houses of worship aren't landmarks, but count-

less churches, mosques and synagogues around the world seek to inspire followers with creative architecture and design. What may seem like divinely inspired architecture to many, however, often looks forbidding or even impossible through the eyes of a solar installer.

Gary Gerber of Sun Light & Power says that religious buildings often present challenges or outright prohibitions with regard to installing PV. »Since church architecture is some of the more interesting architecture around, we have some challenging roofs. One was a 60-degree angle and was like working on the side of a mountain,« he says. »And one we are trying to get now has a completely unworkable main roof and, frankly, it's an icon and a landmark and you wouldn't want to touch it.«

Few places, though, could present the challenge of the Tassajara Zen Mountain Center. Not only is Tassajara located at the end of a long road, a rooftop install is simply impossible because the buildings are nestled into a heavily shaded valley – it could have been done if the point wasn't to actually produce much power. Instead, the install was done 90 m above where the center's other buildings are located. »Everything we used to construct the array had to be carried by hand up the side of the mountain and up the winding steps,« says Simon Moyes. This included concrete and steel to build a solid structure on which to mount the panels that was able to withstand strong mountain storms in the winter. In addition, the wiring had to be placed in 90 m of metal conduit, a necessary step to protect it from fire and animals, and run to the electrical room where the inverters are located.

Despite the engineering and other challenges, Moyes says the system has been functioning just as was hoped. And for him, it's yet another way he can put his faith into practice. »In Zen Buddhism, there is an emphasis on caring for all beings, so it's kind of a way of shifting the focus away from self-centeredness towards concern for others and ultimately our dependency on others,« he says. »Our environmental impact and being aware of that is the fruit of our practice.« Chris Warren