
**BOTTOM
LINE
MINISTRIES
THAT
MATTER:**

Congregational
Stewardship with
Energy Efficiency
and Clean
Energy Technologies

The Eco-Justice Program office of the National Council of Churches USA works in cooperation with the national bodies of member Protestant and Orthodox denominations to protect and restore God's Creation. Since its founding in 1950, the National Council of the Churches of Christ USA has been the leading force for ecumenical cooperation among Christians in the United States. The NCC's member faith groups—from a wide spectrum of Protestant, Anglican, Orthodox, Evangelical, historic African American and Living Peace churches—include 45 million persons in more than 100,000 local congregations in communities across the nation.

Prepared by: Matthew Anderson-Stembridge and Phil D. Radford
Editors: Cassandra Carmichael and Karen Galles

National Council of Churches USA
Eco-Justice Programs
110 Maryland Avenue, NE, Suite 108
Washington, DC 20002
info@ecojustice.org
www.ncccecojustice.org

EXECUTIVE SUMMARY

Whether large or small, urban, rural, or suburban, most congregations use energy for lighting, heating, or cooling in order to conduct the variety of program ministries and worship events that are an integral part of church mission. Almost every congregation across the country is powered and heated at least in part by coal, oil, or natural gas. The fossil fuels used by congregations have been rising in price and impacting church budgets. Their use also adversely affects human and environmental health.

Burning fossil fuels such as oil, coal, and natural gas to power places of worship is increasingly costly to congregational finances, congregants' health, and God's creation. By utilizing energy efficiency and clean energy technologies, congregations can cut utility costs by 25-30 percent, saving \$8,000 to \$17,000 per year. This shift can make significant contributions to a cleaner environment. If each of the nation's congregation buildings cut its energy use and costs 25 percent, they would save nearly \$500 million to spend on other priorities¹ while preventing more than five million tons of carbon emissions.²

This report addresses:

- The costs and savings by state for congregations that invest in clean energy and energy efficiency
- Ways that judicatories can pool resources to invest in clean energy and encourage energy efficiency
- The Christian call and moral obligation to protect God's creation and address global warming and pollution through proper energy stewardship
- Resources needed to take the next steps toward saving money to spend on church mission while caring for creation.

TABLE OF CONTENTS

3	The Christian Call: Stewardship and Justice
4	Fossil Fuel Costs
4	Energy Use and Global Warming
4	Health Effects of Fossil Fuels
6	Energy Efficiency Case Studies
6	Energy Efficiency for Religious Institutions
6	Church Efficiency Investments State by State
8	Clean Energy: Investing in a Brighter Future
11	Conclusion
12	Appendix

Approximately 68 percent of African Americans live within 30 miles of a coal-fired power plant, compared to 56 percent of whites.³

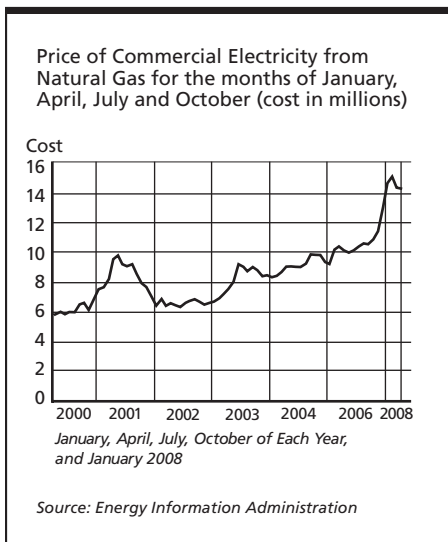
THE CHRISTIAN CALL: STEWARDSHIP AND JUSTICE

Religious organizations are responsible for the financial and spiritual solvency of their houses of worship. A bold commitment to pursue energy efficiency and utilize sustainable sources of energy can save money, protect God's creation, and be a powerful ministry of justice and love. In an atmosphere in which church financial resources are scarce, striving toward maximum savings through energy efficiency is a responsible choice. Fortunately, congregations of all faiths in many states can save thousands of dollars by investing in energy efficiency and clean energy sources.

Caring for Creation. As people of God, Christians are called to care for God's gracious gift of creation. Christians are called to be moral images of God and to reflect God's divine love and justice through "keeping" the Garden (Genesis 2:15). This special relationship with God requires good stewardship of God's creation. Christian concern should extend beyond humanity to encompass the whole of creation—from rivers and oceans to fields and mountains. Energy in the US, typically generated from coal-fired plants, negatively impacts God's creation by creating pollution and contributing to global warming. People of faith can strive to reduce the impacts of their energy consumption in order to fulfill the ministry to be better stewards of God's creation.

Justice. The world is increasingly bound together as a global community. Christians are called to create right relationships, both social and ecological, with all of God's creation. The burning of fossil fuels for energy use disproportionately impacts the health of communities of color, people living in poverty, and children. People of faith have the opportunity to put their faith in action to create a more just, sustainable world through their energy choices.

Seventy-one percent of Latinos live in counties that violated federal air pollution standards and are more than twice as likely as either blacks or whites to live in areas with elevated levels of air pollution. ⁴



FOSSIL FUEL COSTS

According to the Department of Energy, since 2000, world oil prices have risen sharply.⁵ While prices may drop slightly from current levels, the Department of Energy states that oil prices in 20 years will be 40 percent higher than they predicted just one year ago. Natural gas has also proven to be volatile in its price and supply in recent years. From 2004 to 2005, the price paid by utilities for natural gas jumped by 37 percent, resulting in significant price spikes to consumers.⁶

ENERGY USE AND GLOBAL WARMING

One of the greatest challenges and moral imperatives today is the need to address global warming. According to the United Nations' Intergovernmental Panel on Climate Change and the United States National Academy of Sciences, burning oil, coal, and natural gas in cars, power plants, and industrial processes creates carbon dioxide pollution and global warming. Global warming is recognized by the religious leaders, the world's leading scientists, business leaders, and national governments as perhaps the greatest threat to human health, livelihood, and security today. According to scientists, global warming will likely produce rising sea levels, extreme weather events, and increased disease and drought. Because global warming will impact all of God's creation on Earth and will have a disproportionate impact on developing nations and people living in poverty, it has become perhaps the most important moral issue of our time.

THE HEALTH EFFECTS OF FOSSIL FUELS

Burning fossil fuels releases pollutants that can trigger asthma and heart attacks and can cause brain damage and birth defects in children. In addition, fossil fuel extraction such as strip mining and mountain-top removal not only devastates the land, but negatively impacts the health of nearby communities.

“Millions of people could die in this century because of climate change, most of them our poorest global neighbors ... for most of us, until recently this has not been treated as a pressing issue or major priority. Indeed, many of us have required considerable convincing before becoming persuaded that climate change is a real problem and that it ought to matter to us as Christians. But now we have seen and heard enough.”

February 2006 statement by 86 evangelical Christian leaders⁷

According to the Environmental Protection Agency, one in six pregnant women in the United States has enough mercury in her blood to pose a significant risk to her developing child⁹.

COAL, MERCURY, AND NEWBORNS

Coal plants are the largest human-caused source of mercury pollution in the air of the United States. Once released into the atmosphere, mercury falls into rivers, lakes, and streams where it builds up in fish and shellfish. People are primarily exposed to mercury through eating fish.⁸ Those most vulnerable to mercury pollution are fetuses, infants, and children.

FOSSIL FUELS, ASTHMA, AND HEART DISEASE

Nitrogen oxides and sulfur dioxide are known to trigger asthma attacks and alter the lungs' defenses and function. Most man-made nitrogen oxide pollution comes from burning oil in automobiles and fossil fuels in power plants. Sulfur dioxide is formed when oil and coal are burned for electricity or through industrial processes. Those most vulnerable to this pollution are children, the elderly, and people with heart or lung disease.¹⁰

COAL MINING AND OUR NATION'S NATURAL HERITAGE

More and more, energy companies are resorting to more invasive extraction methods such as mountaintop removal. Mountaintop removal, which is prevalent in West Virginia, is a method of coal mining in which 500 feet or more of the tops of mountains are blown off, exposing coal. What remains of the mountaintop is dumped then into

A 1995 American Cancer Society study of over half a million people in 151 cities demonstrated that premature death from cardio-pulmonary and other causes increased by 17 percent when people were exposed to higher levels of nitrogen and sulfur dioxide.¹¹

Many of the same fossil fuel pollutants that harm our health are also detrimental to creation. For example, nitrogen oxides, form smog, contribute to acid rain, upset the chemical balance in water bodies and react with other chemicals in the air to form toxic chemicals.¹² Sulfur dioxide contributes to acid rain, which damages crops and acidifies our soil and waterways.¹³

ENERGY EFFICIENCY CASE STUDIES

Hebron Baptist Church
Dacula, Georgia

Annual Savings: \$32,000

CO₂ Reduction: 1 million lbs

The Hebron Baptist Church installed nearly 1,000 new high efficiency lights, saving \$1,400 per month after loan payments. The project was financed and managed by U.S. Energy Capital, which provides financing and management for energy efficiency projects across the country.

Bethesda Lutheran
Ames, Iowa

Annual Savings: \$5,000

CO₂ Reduction: 100,286 lbs

Bethesda Lutheran replaced incandescent lighting with compact fluorescent lighting, installed computer controls to heat and cool occupied rooms, purchased new energy efficient freezers, and installed new storm windows over the stained glass windows.

Solona Beach Presbyterian
Solona Beach, California

Annual Savings: \$6,620

CO₂ Reduction: 120,000 lbs

The Church upgraded its incandescent lamps with fluorescent lighting, added occupancy sensors, installed LED exit signs and new air-conditioning and heating systems.

Source: U.S. Environmental Protection Agency (EPA)

local valleys, polluting local waterways, and increasing flashfloods and mudslides. According to the United States Environmental Protection Agency (EPA), mining dries up an average of 100 wells a year and contaminates water in others. In many coalfield communities, the purity and availability of drinking water are keen concerns. Blasting and shearing mountains have added to the damage done to underground aquifers by deep mines.¹⁴

ENERGY EFFICIENCY FOR RELIGIOUS INSTITUTIONS

Religious buildings use two percent of the total amount of energy consumed by all commercial buildings in the U.S.¹⁵ With energy efficient products becoming more readily available, this provides religious leaders and facility managers a tremendous opportunity to reduce energy use and promote healthy communities. There are many opportunities to reduce energy use and improve conservation. From installing high efficiency windows to insulating water heater tanks, from adequately caulking around windows to using a programmable thermostat, opportunities abound for congregations.

Congregations that commit to substantially reducing energy use can cut utility costs by 25-30 percent and make significant contributions to a cleaner environment. If each of the nation's congregation buildings cut energy use and costs 25 percent, they would save nearly \$500 million to spend on other priorities¹⁶ while preventing more than five million tons of CO₂ emissions.¹⁷ Many congregations across the country should be able to save \$8,000 to \$17,000 by purchasing energy efficient products such as exit lights, light bulbs, central air conditioning units, computers, and furnaces over the lifetime of the products. Larger congregations can save even more by making smart energy efficiency investments.

CHURCH EFFICIENCY INVESTMENT STATE BY STATE

The Department of Energy assessment of energy use in congregations demonstrates that a majority of congregations use furnaces for heating (57 percent), a combination of incandescent and fluorescent lighting (77 and 79 percent respectively), and centralized water-cooling systems (72 percent). A significant percentage of congregations use central air conditioning units (40 percent) and have between one and four computers (44 percent).¹⁸

Figure 1 takes this work a step further by analyzing the state-by-state savings that congregations can achieve by replacing the most frequently used products with energy efficient products. These figures demonstrate that real financial savings can be achieved in any part of the United States.

FIGURE 1. STATE-BY-STATE ENERGY EFFICIENCY SAVINGS

State	2004		Computer Savings	Monitor Savings	Exit Lights	CAC	Furnances	CFL Lights	Total Savings
	Commercial Electric Rate	2004 \$/Therm							
Idaho	5.37	0.837	\$8	\$38	\$2,680		\$5,725	\$2,050	\$10,501
West Virginia	5.46	1.013	\$8	\$40	\$2,710		\$5,703	\$2,050	\$10,511
Kentucky	5.6	1.018	\$8	\$40	\$2,740		\$5,357	\$2,100	\$10,245
Arkansas	5.64	0.866	\$8	\$40	\$2,750		\$3,431	\$2,100	\$8,329
Missouri	5.8	1	\$8	\$42	\$2,790		\$5,352	\$2,150	\$10,342
Nebraska	5.84	0.76	\$8	\$42	\$2,800		\$4,555	\$2,150	\$9,555
North Dakota	5.86	0.621	\$8	\$42	\$2,810		\$6,045	\$2,150	\$11,055
Virginia	5.88	1.013	\$8	\$42	\$2,810		\$5,341	\$2,150	\$10,351
Utah	5.9	0.675	\$8	\$42	\$2,810		\$4,160	\$2,150	\$9,170
Wyoming	5.98	0.724	\$8	\$42	\$2,840		\$4,980	\$2,150	\$10,020
Oregon	6.15	0.937	\$8	\$44	\$2,880		\$7,017	\$2,200	\$12,149
Washington	6.17	0.94	\$8	\$44	\$2,880		\$7,900	\$2,200	\$13,032
South Dakota	6.18	0.809	\$8	\$44	\$2,890		\$5,369	\$2,200	\$10,511
Minnesota	6.31	0.843	\$8	\$46	\$2,920		\$5,667	\$2,200	\$10,841
Indiana	6.31	0.856	\$8	\$46	\$2,920		\$4,799	\$2,200	\$9,973
Kansas	6.45	1.009	\$8	\$46	\$2,950		\$5,331	\$2,250	\$10,585
Okahoma	6.55	0.968	\$8	\$48	\$2,980		\$4,225	\$2,250	\$9,511
North Carolina	6.7	1.045	\$10	\$48	\$3,010		\$5,215	\$2,300	\$10,583
Iowa	6.75	0.851	\$10	\$48	\$3,030		\$5,031	\$2,300	\$10,419
Georgia	6.88	1.145	\$10	\$50	\$3,060		\$5,092	\$2,350	\$10,562
Colorado	6.89	0.748	\$10	\$50	\$3,060		\$4,374	\$2,350	\$9,844
South Carolina	6.91	1.081	\$10	\$50	\$3,070	\$377	\$8,268	\$2,350	\$14,125
Tennessee	7.05	0.951	\$10	\$50	\$3,100		\$3,885	\$2,350	\$9,395
Alabama	7.12	1.091	\$10	\$52	\$3,120		\$4,342	\$2,350	\$9,874
Wisconsin	7.24	0.871	\$10	\$52	\$3,150		\$6,048	\$2,400	\$11,660
Arizona	7.28	0.85	\$10	\$52	\$3,160	\$478	\$2,249	\$2,400	\$8,349
New Mexico	7.39	0.794	\$10	\$54	\$3,190		\$4,384	\$2,400	\$10,038
Montana	7.42	0.911	\$10	\$54	\$3,190		\$6,008	\$2,400	\$11,662
Delaware	7.44	1.056	\$10	\$54	\$3,190		\$6,902	\$2,450	\$12,606
Washington, D.C.	7.45	1.36	\$10	\$54	\$3,200		\$7,980	\$2,450	\$13,694
Illinois	7.54	0.91	\$10	\$54	\$3,220		\$6,109	\$2,450	\$11,843
Maryland	7.56	0.93	\$10	\$54	\$3,230		\$5,388	\$2,450	\$11,132
Michigan	7.57	0.796	\$10	\$54	\$3,230		\$5,754	\$2,450	\$11,498
Louisiana	7.58	0.956	\$10	\$54	\$3,230	\$631	\$2,239	\$2,450	\$8,614
Florida	7.61	1.143	\$10	\$54	\$3,240	\$1,413	\$1,383	\$2,450	\$8,550
Ohio	7.75	0.918	\$10	\$56	\$3,280		\$6,210	\$2,500	\$12,056
Texas	7.9	0.823	\$10	\$56	\$3,310	\$874	\$1,812	\$2,500	\$8,562
Mississippi	7.99	0.884	\$12	\$58	\$3,340	\$479	\$2,894	\$2,550	\$9,333
Pennsylvania	8.51	1.059	\$12	\$62	\$3,460		\$6,863	\$2,600	\$12,997
Nevada	9.08	0.838	\$12	\$66	\$3,610	\$537	\$3,256	\$2,700	\$10,181
Maine	9.89	1.23	\$14	\$70	\$3,810		\$9,810	\$2,850	\$16,554
Connecticut	9.9	1.131	\$14	\$72	\$3,810		\$8,268	\$2,850	\$15,014
New Jersey	9.96	1.094	\$14	\$72	\$3,830		\$7,176	\$2,850	\$13,942
Rhode Island	10.53	1.177	\$14	\$76	\$3,970		\$8,567	\$3,000	\$15,627
New Hampshire	10.99	1.304	\$14	\$78	\$4,080		\$10,102	\$3,050	\$17,324
Massachusetts	10.99	1.248	\$14	\$78	\$4,080		\$8,604	\$3,050	\$15,826
Alaska	10.99	0.414	\$14	\$78	\$4,080		\$3,380	\$3,050	\$10,602
Vermont	11.42	0.87	\$16	\$82	\$4,190		\$6,336	\$3,150	\$13,774
California	11.53	0.863	\$16	\$82	\$4,220	\$713	\$1,757	\$3,150	\$9,938
New York	12.9	1.011	\$18	\$92	\$4,560	\$303	\$6,523	\$3,400	\$14,896
Hawaii	16.19	2.142	\$22	\$116	\$5,370	\$7,964		\$4,000	\$17,472

Figure 1 assumes that congregations in each state have two computers, ten exit lights, one furnace, one central air conditioning unit, 50 light fixtures, and that each congregation pays the average electricity and natural gas¹⁹ rates for each state. The savings estimates were determined using Department of Energy ENERGY STAR calculators for each product. The conclusion provides an estimated savings that many congregations can achieve over the lifetime of the products even though they often have a higher purchase price than other non-efficient alternatives. Because electric rates, gas prices, climate, and facility size vary, these estimates should be viewed as examples of what congregations can achieve.

To help congregations make informed choices about investing in energy efficiency, the United States Environmental Protection Agency (EPA) ENERGY STAR program created “Putting Energy Into Stewardship,” providing a step-by-step process that congregations can follow to assess opportunities and finance energy efficient projects. The report can be found at www.energystar.gov

**AFTER THE FLOOD:
ENERGY EFFICIENCY PRACTICES**

In 2005, St. John’s Baptist Church in New Orleans, Louisiana, sustained major damage as a result of flood waters and wind damage from Hurricane Katrina. This predominantly African American congregation, anxious to decrease their future energy costs, looked at a number of energy efficient measures when drafting their rebuilding plans. Energy efficient experts looked at including energy efficient lighting, blown insulation in the roof and walls, LED exit lights, energy efficient windows and doors, motion sensors for lighting, and energy efficient heating and air conditioning units. With community financial pressures on the rise because of the economic impacts of Hurricane Katrina, these cost saving measures will help ensure that St. John’s continues to provide a vibrant ministry for the community.

CLEAN ENERGY: INVESTING IN A BRIGHTER FUTURE

Clean energy uses renewable sources of energy such as wind and solar, thereby reducing or eliminating the negative health and ecological impacts of fossil fuel-based energy. Congregations in all states can purchase clean energy for small premiums. This cost can frequently be offset by money saved using energy efficient products.

Clean energy has dropped in price dramatically and could produce a significant portion of our nation’s energy if institutions with significant buying power, such as religious judicatories, create more demand. Both solar and wind electricity have declined in price by 80 to 90 percent over the past two decades. Wind energy prices average 4 cents per kWh, making it competitive and readily available in many parts of the country. Solar has dropped from more than one dollar to as low as 18 cents per kWh without subsidies, making it competitive with the electricity rates paid by commercial users in many parts of the country. This dramatic price drop is largely due to the growth in production of solar panels and wind turbines, which have both experienced an average 30 percent market growth rate in the past five years.²⁰

PURCHASING CLEAN ELECTRICITY FROM THE GRID

Congregations can purchase clean electricity directly from the grid, the wiring and infrastructure that carries electricity into homes and businesses, by purchasing it from a local utility or purchasing Renewable Energy Credits. Renewable Energy Credits represent one megawatt (MWh) of renewable energy, and can help provide the capitol needed to build new clean energy power plants. Renewable Energy Credits also ensure that the energy religious institutions purchase doesn’t negatively impact the health or ecological well-being of God’s creation. Either of these methods generally costs a premium of \$.02 per kWh.²¹ To explore your options and different prices for purchasing clean energy go to www.eere.energy.gov/greenpower/buying/buying_power.shtml

ON SITE SOLAR ELECTRICITY

As prices have declined for solar energy over the past two decades, it has become possible for congregations in 18 states and Washington, DC, to save money by purchasing solar electricity through a power purchase agreement (see Financing and Purchasing Solar Power below). Depending on the state, congregations that invest in large solar projects stand to make a return of up to 26 percent on their initial investment in a solar project. (see Figure 2)

Solar electricity is produced by photovoltaic panels that convert sunlight into electricity. There is an initial investment associated with the installation of these panels, but it can generate a significant cost savings within 4.5 years. There are five major factors that determine the price of solar electricity throughout the United States and whether it will generate a cost savings for congregations.

- 1. State, Utility or Local Subsidies.** To analyze the cost effectiveness of solar, the amount of subsidies provided to solar panel installation is more important than the amount of daylight in the area. Subsidies and rebates can dramatically reduce the initial installment investment for a solar project. For example, the state of California provides a subsidy of \$2,800 per kW panel or up to \$2.8 million for one megawatt (MW) of installed panels. This subsidy should cover up to one half of the cost of the installation. The city of Austin, Texas, offers a \$4,000 per kW panel subsidy up to \$100,000 per customer. For a complete listing of solar rebates state by state visit <http://www.dsireusa.org>.
- 2. Tax Status.** Companies receive federal tax credits, state tax credits (in some states), and tax write-offs for loan interest and depreciation, reducing the price of solar installation of solar by about 30 percent. Non-profit organizations such as congregations do not receive these benefits. For this reason, solar companies sometimes install, own, and operate panels in agreement with nonprofits so that the project can take advantage of these tax credits.
- 3. Daylight.** The amount of sun in an area is less of a factor in the feasibility of solar than rebates or tax status. The amount of daylight may increase the amount of electricity produced by solar by 30 percent in the continental U.S. Rebates and tax credits could reduce the price of the up front investment by 50 percent or more.
- 4. Large Purchases.** Congregations that make large purchases of solar panels that can produce one megawatt of power or that negotiate large contracts at the judicatory level for multiple congregations can reduce the price of solar installations dramatically.

5. Electric Rate. States such as California, New York, and New Jersey with high electric rates and solar subsidies have led the United States in solar installations. In 2004, the average electrical rate charged to commercial customers in the U.S. was \$.0816 per kWh, ranging from \$.0537 in Idaho to \$.1619 per kWh in Hawaii.²² The electric rate far outweighs the amount of daylight in determining how economical solar is in a state. Utility companies often employ various rate structures so that a congregation may be charged multiple rates depending upon usage (time of day and volume). These varying rates can impact

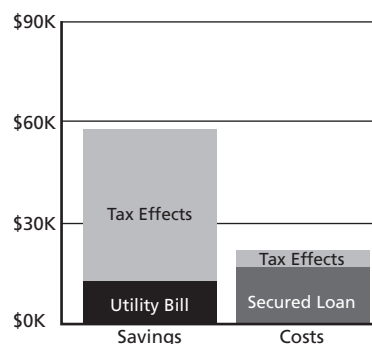
INTERFAITH COLLABORATION FOR ENERGY EFFICIENCY CASE STUDY: INTERFAITH COALITION ON ENERGY

The Interfaith Coalition on Energy (ICE) inspires congregations to reduce the costs of operating their facilities by guiding congregations to use measurably less energy, to purchase energy at lower cost, and to anticipate and prevent problems with mechanical and electrical systems. Their ultimate goal is to create money for community service while practicing environmental stewardship. Since 1982 ICE has performed energy audits for over 500 congregations in Pennsylvania and surrounding states and has presented more than 200 training workshops for the operators of religious facilities. For more information, visit www.interfaithenergy.com

FIGURE 2. SOLAR COSTS AND SAVINGS

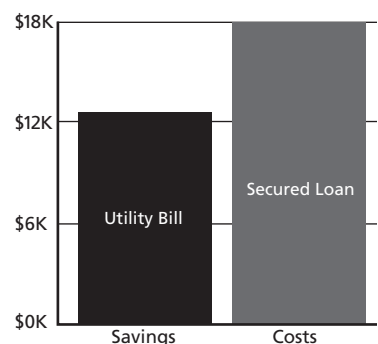
Year One Savings from a 100kW Solar System for a For-Profit in Hartford, CN

Annual Savings and Costs (2006)
(System has net savings of \$35,605 per year)



Year One Costs from a 100kW Solar System for a Non-Profit in Hartford, CN

Annual Savings and Costs (2006)
(System has net savings of \$5,605 per year)



whether solar power is cost effective for congregations. Congregations may be able to install smaller solar systems to offset energy used at higher electric rates and thereby reducing their overall bill while lowering the solar installation capital costs. Analyzing the congregation’s overall utility bill will help determine whether a solar system—whether small or large—is cost effective.

FINANCING AND PURCHASING SOLAR POWER

An increasing number of solar companies offer power purchase agreements, where the solar company installs, owns, and operates solar panels on customers’ properties and sells the electricity at a price that is less than or equal to the customers’ normal electric bills. The company can reap the tax benefits by owning the panels and passing savings on to the congregation.

In power purchase agreements, solar companies offer 100 percent or partial financing. In agreements that utilize 100 percent financing, the solar company provides the financing and owns and maintains the solar electric system. The congregation does not provide any capitol and signs a long-term contract to purchase the electricity at a rate less than or equal to its energy bills. This method is only successful in a few states where solar incentives are high. In agreements where there is partial financing by solar companies, congregations finance a portion of the total cost through cash reserves or low interest capitol improvement loans by pre-paying for electricity savings. The solar company finances the remainder of the project, owns and maintains it, and provides electricity free of charge during the pre-payment period.

Figure 2 is a snapshot of solar projects in the states with a 20-year contract and partial financing. A congregation in New Jersey, for example, could purchase 133 kW of solar panels with an up-front

FIGURE 2. STATE-BY-STATE SOLAR SAVINGS AND INVESTMENTS

	Size of Solar System (kW)	Initial Payment	Rate of Return	Payback (years)
New Jersey	133	\$69,119	26.10%	4.5
Connecticut	133	\$77,382	19.30%	5.8
Hawaii	133	\$266,575	16.50%	6.6
Texas	25	\$19,808	14.10%	7.5
New York	133	\$155,094	12.30%	8.3
California	133	\$299,417	11.00%	9
Massachusetts	133	\$195,641	9.60%	9.9
North Carolina	133	\$140,622	8.50%	10.6
Montana	133	\$154,007	7.50%	11.5
Oregon	800	\$771,529	5.90%	10.3

Source: SunEdison

Congregations and judicatories can issue a request for proposals (RFP) for a power purchase agreement for solar electricity (see Appendix A). Issuing an RFP ensures that companies have the opportunity to bid in a transparent and fair process to serve the congregation or judicatory.

payment of \$69,119. The electricity savings would pay for the \$69,119 within 4.5 years and would yield a 26 percent return on investment over the lifetime of the contract. If the congregation took out a low interest loan to cover the \$69,119 down payment, the project would remain cost effective as long as the interest on the loan was below the 26 percent rate of return.

THE POWER OF JUDICATORIES

Judicatories can use capital improvement funds or create low-interest clean energy and energy efficiency loan programs to set aside funds for clean energy investments in congregations. Judicatories and other religious regional organizational bodies can also offer capitol improvement loans that could be used to install solar panels. Judicatories can also pool the purchasing power of several congregations and create one contract with a company to secure low prices that one congregation alone could not secure.

CONCLUSION

Houses of worship can address financial stewardship while providing loving care for all of God's creation. Most congregations can save thousands of dollars in energy bills by investing in energy efficiency. Congregations can invest money in clean technologies such as solar power that are direct investments in creation and human health while directing their savings toward the mission of the congregation.


God placed Adam and Eve in the Garden of Eden with the commandments to *abad* and *shamar*—Hebrew words to serve and tend (Genesis 2:15). God has not revoked this sacred charge given to humankind. Christians should take the necessary and adequate steps to graciously steward God's creation, to adequately address global warming, and to care for human health of God's people. This will help fulfill the call to care for all that God has given.

CASE STUDY: THE MISSION INVESTMENT FUND

Various religious denominations have significant funds to invest in capital improvements to congregation buildings. The Evangelical Lutheran Church in America (ECLA), for example, manages the Mission Investment Fund (MIF) of the ECLA, with total assets of more than \$500 million.

As of April 2006, the MIF offered an adjustable rate of 5.75 percent interest 20-year loans to congregations. The rate is reviewed every five years to reflect general market conditions. Congregations in Oregon, Montana, North Carolina, Massachusetts, California, New York, Texas, Hawaii, Connecticut, and New Jersey could apply for such a loan to prepay electric bills and achieve a rate of return from energy savings of 29.25 percent (rate of return minus 5.75 percent). Other low-interest loan programs can be found at www.dsireusa.org.

APPENDIX A: SAN DIEGO REQUEST FOR PROPOSAL



City of San Diego
Environmental Services Department
Energy Conservation and Management Division

Request for Proposal
For
Power Purchase of Renewable Energy (Photovoltaics)
For
City Facilities

The City of San Diego is seeking a firm, or a team of firms, to provide cost effective solar photovoltaic electric generating systems at eight City sites. The City intends to enter into power purchase agreement(s) for terms up to twenty years with solar PV developer(s) at these sites. The developers may also be asked to assist the City with identifying implementing solar PV projects at other sites depending upon the success of the initial program.


The City evaluated twenty four facilities that appear to have potential of accommodating solar PV systems ranging in size from 30 kilowatts to 1 megawatt. From this evaluation, the City selected eight specific sites for inclusion into this RFP. The estimated electric generation potential of these six sites is approximately **1.3 Megawatts**. By making a large-scale investment in solar PV systems, the City hopes to drive down unit costs and expedite installations.

The scope of services provided shall also include, but not be limited to, securing all permits and approvals from governing agencies, all labor, taxes, services, and equipment necessary to produce fully operational solar PV systems at the agreed-to City facilities.

The City envisions the solar PV developer(s) owning and operating the systems after system commissioning. Proposals submitted in response to this RFP should assume developer ownership. The City will consider alternate proposals to developer ownership/power purchase agreements, however funding for turnkey projects is not available and third-party financing is not a current option. Any alternate proposals shall be in addition to (not in substitution for) the proposal(s) assuming developer ownership.

The City of San Diego anticipates installing approximately 5 Megawatts over the next five years. The term of the PV partnership is also anticipated to be five years. The initial term of the proposed agreement will be one year. The contract will also provide four additional - one year contract options. The four - one year contract options will be negotiated on an annual basis based upon the previous year's success of the partnership

Page 1 of 2



REQUESTING A COPY OF THE PROPOSAL:
Upon request the City will mail proposal to interested vendors
Please contact Denise Rocha at 858 492 6005

PROPOSALS SHALL BE SUBMITTED TO:
John Helminski, Project Officer
City of San Diego
Environmental Services Department
9601 Ridgehaven Court, Suite 120, MS 1101B
San Diego, CA 92123

PROPOSAL DUE ON JANAUARY 10, 2005, NO LATER THAN 5:00 PM
Submit Ten (10) Copies

QUESTIONS REGARDING THIS RFP SHOULD BE SUBMITTED TO:

John Helminski, Project Officer II
City of San Diego
Environmental Services Department
9601 Ridgehaven Court, Suite 120, MS 1101B
San Diego, CA 92123

PRE-PROPOSAL CONFERENCE AND SITE VISITS
TO BE HELD ON DECEMBER 8, 2004

QUESTIONS FROM PROPOSERS ARE DUE TO THE CITY OF SAN DIEGO
ON DECEMBER 10, 2005, NO LATER THAN 5:00 PM

OR

QUESTIONS SUBMITTED IN WRITING BY FACSIMILE (FAX)
TO PHONE NUMBER: 858 492 5068

IMPORTANT:

Answers to questions shall be provided to those firms on the list of firms who received copies of the RFP from the City of San Diego, Environmental Services Department, Energy Conservation and Management Division located at:
9601 Ridgehaven Court, Suite 120, MS 1101B
San Diego, CA 92123

Page 2 of 2

¹U.S. Environmental Protection Agency, *Putting Energy Into Stewardship, ENERGY STAR® For Congregations Guide*, 480-B-00-003, 2000

²U.S. Environmental Protection Agency, Congregations, 2005, available from http://www.energystar.gov/index.cfm?c=small_business.sb_congregations&layout=print; Internet; accessed February 15, 2006

³Air of Injustice, Clear the Air, Georgia Coalition for the People's Agenda, The Southern Organizing Committee for Economic and Social Justice, 2002

⁴ibid

⁵Energy Information Administration, *Annual Energy Outlook 2006 with Projections to 2030*, (Washington, DC, U.S. Government Printing Office, 2006), Report #:DOE/EIA-0383

⁶ibid

⁷<http://www.christiansandclimate.org/statement>

⁸U.S. Environmental Protection Agency, Mercury Basic Information; 2006, available from <http://www.epa.gov/mercury/about.htm>; Internet; accessed February 15, 2006

⁹Clearing the Air: An Oversight Hearing on the Administration's Clean Air Enforcement Program, Senate Democratic Policy Hearing, February 6, 2004, <http://democrats.senate.gov/dpc/hearings/hearing11/transcript.pdf>

¹⁰U.S. Environmental Protection Agency, National Air Quality 2001 Status and Trends, 2001, available from <http://www.epa.gov/air/airtrends/aqtrnd01/sulfur.html> and <http://www.epa.gov/air/airtrends/aqtrnd01/nitrodiox.html>; Internet, accessed February 15, 2006

¹¹Krewski, D. et al., *Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality*, Health Effects Institute, 2000

¹²U.S. Environmental Protection Agency, Health and Environmental Impacts of Nox, 2000; available from <http://www.epa.gov/air/urbanair/nox/hlth.html>; Internet; accessed February 13, 2006

¹³U.S. Environmental Protection Agency, SO₂—How Sulfur Dioxide Affects the Way We Live & Breathe, 2000; available from <http://www.epa.gov/air/urbanair/so2/index.html>; Internet; accessed February 13, 2006

¹⁴<http://www.epa.gov/maia/html/valley.html>

¹⁵Energy Information Administration, *Electric Power Annual 2004*, p. 47, 2005

¹⁶U.S. Environmental Protection Agency, *Putting Energy Into Stewardship, ENERGY STAR® For Congregations Guide*, 480-B-00-003, 2000

¹⁷U.S. Environmental Protection Agency, Congregations, 2005, available from http://www.energystar.gov/index.cfm?c=small_business.sb_congregations&layout=print; Internet; accessed February 15, 2006

¹⁸Energy Information Administration, Commercial Buildings Energy Consumption Survey 2003 Building Characteristics Overview, Buildings, Size and Age Data by Equipment Types for Religious Worship Buildings, 2004; available from <http://www.eia.doe.gov/emeu/cbecs/pba99/worship/worshipequiptable.html>; Internet; accessed February 15, 2006

¹⁹Energy Information Administration, *Electric Power Annual 2004*, p. 47, Washington, DC, U.S. Government Publishing Office, 2005

²⁰Joel Makower, et al., Clean Energy Trends 2004, Clean Edge, Inc., March 2004

²¹Lori Bird, et al., *Trends in Utility Green Pricing Programs (2003)*, (National Renewable Energy Laboratory, September 2004), NREL/TP-620-36833

²²Energy Information Administration, *Electric Power Annual 2004*, p. 47, Washington, DC, U.S. Government Publishing Office, 2005

