ECOFaith: assessing the environmental performance of faith-based communities

Proposed by: Christine Chen
Stephanie Dolmat-Connell
Jessica Golman
Sarah Siedschlag

Advisor: Oran Young

Date: May 28, 2010
Abstract

As a representative of diverse faith groups serving the greater Santa Barbara community, our client, the Environmental Coalition of Faith Communities (ECOFaith), is developing a comprehensive program to aid religious groups in improving their environmental performance. ECOFaith has chosen to focus both on greening worship buildings by reducing resource consumption and greenhouse gas emissions and on greening congregations by promoting environmental education, awareness, and behavior change in the faith community. The two main obstacles that ECOFaith has encountered in pursuing its mission are lack of funds and lack of expertise, in terms of evaluating the performance of its environmental initiatives and education programs as well as making informed choices to increase its members’ environmental sustainability. Therefore, the primary objective of this project is to develop tools that will help ECOFaith enhance the impact of its programs. We will first evaluate ECOFaith’s existing projects and education programs to identify achievements and opportunities for improvement. The results from this assessment will then help us develop a refined process and toolkit that provides recommendations fitting the unique needs and abilities of faith institutions. Our process will help ECOFaith institutions design feasible, high-impact projects, engage congregation members, and measure and evaluate progress—without the help of expensive outside consultants.
# Table of Contents

Executive Summary ....................................................................................................................................... 4

Introduction .................................................................................................................................................. 6

Project Objectives ......................................................................................................................................... 7

Literature Review .......................................................................................................................................... 8

Introduction: Understanding Faith-based Environmentalism ................................................................. 8

Greening of Worship Buildings ............................................................................................................... 11

  Greenhouse Gas Emission Accounting ................................................................................................. 11

  The Role of Green Building and Retrofitting ....................................................................................... 12

  Carbon Calculators and Other Measurement Tools ........................................................................... 15

Greening of Congregations ..................................................................................................................... 17

  Connections between Environmental Awareness, Values, and Behavior .......................................... 17

  Sociological Methods for Evaluating Education Programs ................................................................. 19

Methodology and Deliverables ................................................................................................................... 22

  Methodology: Analysis of Pilot Projects ................................................................................................. 22

  Deliverable: Report of Pilot Project Accomplishments ....................................................................... 24

  Methodology: Improving Future Projects ............................................................................................. 24

  Deliverable: Toolkit for Future Projects ............................................................................................... 25

Milestones ................................................................................................................................................... 26

Management Plan ....................................................................................................................................... 27

Contacts and Professional Links .................................................................................................................. 30

Appendix I: Financial Information ............................................................................................................... 31

Appendix II: Software Features ................................................................................................................... 31

Notes ........................................................................................................................................................... 33
Executive Summary

As a representative of diverse faith groups of the greater Santa Barbara community, our client, ECOFaith, has acknowledged that climate change and resource scarcity are issues that transcend religious boundaries and that require collaborative leadership. The organization is developing a comprehensive program to aid religious groups in assessing the energy consumption of their places of worship and to promote environmental education, awareness, and behavior change in the faith community. In this report, we will refer to the former goal as “greening the worship buildings” and the latter goal as “greening the congregation.” ECOFaith’s membership alone includes twenty-one religious communities in the greater Santa Barbara area, four of which have already implemented pilot projects to green their worship buildings and congregations. With 50,000 religious congregations within the state of California alone, developing an effective and easily applicable procedure to improve the environmental performance of faith-based institutions could play an important role in addressing today’s most intractable environmental problems.

Our principal objective is to develop tools that will help ECOFaith enhance the impact of its programs. We will accomplish this by first evaluating ECOFaith’s existing projects and education programs and then by developing an improved process and toolkit to provide recommendations fitting the needs and abilities of the institutions. Our process will help ECOFaith members design feasible, high-impact projects, involve congregation members, and measure progress—thereby reducing their reliance on expensive outside consultants.

In order to accomplish our objective, we first plan on analyzing the quantitative and qualitative results of the actions ECOFaith members have already implemented through their four existing pilot projects. This evaluation will provide ECOFaith with a metrics-based report that can help them assess their progress and that they can communicate to existing and potential funders. To this end, we will interview the congregation leaders and relevant congregation members about what actions they have implemented and gather resource consumption information from utility bills. We will then review current literature for the best methods to convert these data into accurate calculations of greenhouse gas emissions and conduct a statistical Before-After-Control-Impact-Paired Series (BACIPS) analysis that will determine whether or not their actions have resulted in a significant reduction in greenhouse gas emissions. In our interviews, we will also seek to understand ECOFaith members’ goals, priorities, constraints, and obstacles in implementing the ECOFaith projects. The results of these interviews will help us highlight the successes of the ECOFaith process as well as generate recommendations for improvement.

Another important aspect of ECOFaith's mission is its goal of promoting a theologically-based motivation for environmental concern within the faith community. Its main vehicle for achieving this aim is its set of education plans, each grounded in the particular faith tradition of the different ECOFaith religious communities. Therefore, in order to develop a comprehensive evaluation of ECOFaith’s existing work, we must also assess the organization’s educational initiatives. To get a sense of the goals and priorities of the education programs, we will conduct one-on-one scoping interviews with the congregation and education leaders. The results from the scoping interviews will help us develop a protocol for conducting focus groups with both congregation members who participated in the education programs and those who did not. The focus groups will explore to what extent the education plans met their objectives, how faith plays into opinions and feelings of responsibility toward the environment, reasons individuals
chose to participate or not participate in environmental education activities, how education programs have changed members’ knowledge and interest in environmental issues, how that knowledge or interest did or did not translate into behavior, and other ways that the institution’s environmental stance affected its congregation members. If time permits, we will also conduct a simple survey of the congregations at large, based on the common issues that emerged during the focus groups. The survey would allow us to create a more comprehensive picture of the congregations and could be conducted following weekly church services in order to improve response rates and time. Not only will the focus group and survey process allow us to assess ECOFaith’s existing education programs, but it will also help us develop a methodology for ECOFaith to evaluate its own education initiatives in the future.

Based on our analysis of the existing ECOFaith projects and process, we will generate a set of recommendations that we will then share with our client. After incorporating their feedback about our recommendations, we will develop a new step-by-step process that will improve the success and impact of their future initiatives. As a part of this process, we will develop a software tool that will provide ECOFaith members with a list of feasible greenhouse gas-reducing actions tailored to the needs and constraints of faith-based institutions. Based on user inputted data, the tool will suggest the most efficient options for change given a specific budget, or the budget necessary to achieve a specific level of greenhouse gas reduction.

By the end of our project, we will provide our client with the following:

- A report that:
  - Quantifies the water, energy, and greenhouse gas reductions achieved in the four pilot projects
  - Analyzes the education component of the four pilot projects by conducting focus groups and a survey to see what worked and what could be improved
  - Assesses the current process based on both the experience of the pilot projects and congregation leader feedback
  - Recommends steps to take to improve the current process

- A toolkit for future projects which includes:
  - A new, refined process that other ECOFaith congregations can use to improve their environmental performance
  - A software tool, specifically tailored to the needs and challenges of faith-based institutions, that helps congregations establish baseline GHG inventory for their worship buildings and helps them conduct a cost-benefit analysis to see which actions to take to reduce greenhouse gases
Introduction

ECOFaith is a coalition of diverse faith groups serving the greater Santa Barbara community, all of whom recognize that collaborative leadership is needed to protect and preserve creation and to be intentional stewards of the environment.1 ECOFaith currently has 21 faith communities under its umbrella and seeks to engage numerous other local and regional faith communities as it grows. Partnering with the ongoing environmental efforts of other community agencies and organizations, such as the Community Environmental Council and the Interfaith Network, ECOFaith’s mission is to:

1. Work towards energy efficiency and conservation in its places of religious faith.
2. Educate and encourage its congregations to adopt environmentally sustainable lifestyles as a dimension of spiritual practice.
3. Partner with the broader community to create a healthy environment.

ECOFaith was formed in 2008 with the encouragement of Congresswoman Lois Capps and a grant from the James S. Bower Foundation.2 The idea to create an environmental coalition of diverse faith communities in Santa Barbara was born at the Faith and Politics Summit in 2007, organized by Karin Quimby, District Representative for Congressperson Lois Capps, where one of the major topics of the summit was the environment. The momentum built further when Rep. Capps invited faith leaders from her Congressional district to meet with the Democratic Congressional leadership as part of a special Faith Day in Washington DC. At that meeting, several prominent members of Congress eloquently articulated the relationship between religion, politics, and the environment. Following these talks, Ed Bastian, President of the Spiritual Paths Foundation, asked the California Central Coast faith leaders if they would support the formation of an interfaith environmental coalition when they returned back home. Everyone in the room replied in the affirmative. In February 2008, Karin Quimby and Ed Bastian convened a meeting in which 16 people representing a cross-section of Santa Barbara Faith Communities supported the formation of a coalition. Six meeting participants agreed to meet again to draft a mission statement and action plan for the coalition. In this initial phase, close to 20 faith communities joined the coalition, including three historically black churches, Jewish and Muslim congregations, and Catholic and Protestant denominations.

The coalition chose four congregations to serve as pilot projects in order to focus its initial efforts.3 The coalition chose the congregations to represent a diversity of denominations and faiths as well as congregation demographics. The four pilot congregations are: Grace Lutheran Church, Holy Cross Catholic Church, Second Baptist Church, and the Islamic Society of Santa Barbara. Each pilot project began with an in-depth assessment of the worship buildings as well as an articulation of the scriptural and inspirational foundation for environmental action. The four pilot projects have addressed a number of different action items and congregations have encountered both extensive opportunities and challenges within the process. ECOFaith now seeks the aid of Bren students to identify and quantify both successes and barriers to success, and to provide recommendations for enhancing the current process by evaluating the experience of the pilot projects.
Project Significance

Recently, some critics have attacked the environmental movement for abandoning the promotion of broader ethics in favor of technological, legal, scientific, and policy-driven solutions while others have condemned contemporary or “third wave” environmentalism as amoral. At the same time, many environmentalists believe that addressing the ecological crisis must involve widespread and deep-seated shifts in individual attitudes and behavior. Religion can play a role in filling this gap by influencing values and conduct. Environmental journalist Mark Dowrie recognized this potential when he wrote that “environmentalism needs to penetrate every institution, ideology, and religious faith in our culture. It needs to be seen as a social as well as a political movement.” With over three-quarters of Americans self-identifying as religious, ECOFaith members and other faith leaders who emphasize stewardship of the natural environment can contribute greatly to the far-reaching social change of which Dowrie writes.

ECOFaith’s mission encompasses not only transforming values but also mobilizing religious communities to mitigate local causes of climate change in their buildings and practices. Resource consumption in the built environment has a significant impact upon ecological, economic, and societal well-being. In addition, given the mounting urgency surrounding global climate change, demand for improved energy efficiency continues to rapidly increase. However, though implementation of green building and sustainable practices has gained momentum in the commercial, residential and government building sectors, no organization has yet sufficiently addressed the particular needs of faith-based institutions.

In the absence of binding national and international climate change legislation, policy development occurs rather at the state, municipal, and organizational levels. State policies such as AB 32 and AB 811 mandate reductions in greenhouse gas emissions; cities such as Santa Barbara and local organizations such as the Community Environmental Council have also established action plans and strategies aimed at a sustainable energy future. This movement must not discount the influence and importance of faith-based institutions at any of these levels. While applying strategies to reduce carbon emissions is not a new concept, framing this project within the context of the faith-based community makes this effort unique in terms of its drivers, potential, and challenges.

As representatives of diverse faith groups serving the greater Santa Barbara community, the ECOFaith coalition has acknowledged that climate change and resource scarcity are issues that transcend religious boundaries and that demand collaborative leadership. The organization is developing a program to help religious groups assess the energy consumption of their places of worship and promote environmental awareness in their congregations. With 50,000 congregations in the state of California alone, developing an effective and easily applicable procedure to improve the environmental performance of faith-based institutions could play an important role in addressing today’s most intractable environmental problems.

Project Objectives

Our principal objective is to develop tools that will help ECOFaith enhance the impact of its programs. We will accomplish this by first evaluating ECOFaith’s existing projects and education programs and then developing an improved process and toolkit to provide recommendations fitting the needs and abilities of the institutions. Our process will help ECOFaith design feasible, high-impact projects, involve congregation members, and measure progress—thereby reducing its reliance on outside consultants.
Literature Review

The focus of this review is to establish the connection between religion and the environment in order to better understand how education might translate into behavior changes, and how religious communities might successfully enact change within their congregations to address sustainability.

Introduction: Understanding Faith-based Environmentalism

A common concern amongst faith-based environmental organizations is that their secular environmental partners do not understand the religious community and its cultural, political, and organizational functioning. Therefore, this section seeks to provide an historical, sociological, and cultural context for our project, an understanding of the obstacles and challenges under which our client operates, and perspective on our client’s unique motivations and opportunities.

Background and History

Modern faith-based environmentalism emerged around the same time as the mainstream environmental movement. One particularly catalytic event was the 1967 publication of Lynn White’s article titled, “The Historical Roots of Our Ecological Crisis,” in *Science*. In his article, White pursued the thesis that the Judeo-Christian tradition is largely to blame for the current ecological crisis, stating that “we shall continue to have a worsening crisis until we reject the Christian axiom that nature has no reason for existence save to serve man.” Calling Christianity the “most anthropocentric religion the world has ever seen,” White pointed to Judeo-Christian teachings that promote human domination over other living beings and man’s duty to exploit nature for his own ends. Yet, despite his strong censure of Christianity, White firmly believed that environmental disasters would be averted not through science and technology but through “a new religion, or [a rethinking of] our old one.” Indeed, he asserted that, “Since the roots of our trouble are so largely religious, the remedy must also be essentially religious.”

While White was not the first to verbalize these views, his article provided fertile ground for debate and induced a wide range of responses, especially among laypeople and scholars within the Abrahamic traditions of Judaism, Christianity, and Islam. These responses can be divided into three categories: apologetic, but arguing that under alternative interpretations these traditions supported environmental sensitivity; confessional, acknowledging the truth of the criticisms and calling for religious reform to promote environmental responsibility; and indifference, viewing environmental concerns as matters unrelated to faith. Regardless of the variation in reactions, however, White’s article provoked vigorous debate, prompting many religious communities to establish or refine an eco-theology to defend their faith—an action that eventually resulted in the development and proliferation of environmental consciousness in mainstream faith communities.

Theological Context for Environmentalism

Though ECOFaith is an interfaith organization that welcomes all religions, an individual treatment of every religion and its relationship with the environment is outside the scope of this review. Therefore, this section focuses on the faiths represented by the four ECOFaith pilot projects: Christianity and Islam.
Christian Environmental Engagement

One study examining Christian environmentalism in the U.S. used interviews, observation, and literature review to identify three general models of Christian eco-theology, which are described briefly below.

**Christian Stewardship** operates under the premise of a biblical mandate for humans to take care of the earth and reinterprets the Genesis commandment of dominion as a divine decree to steward creation. Adherents to Christian Stewardship believe that the current environmental crisis stems from human arrogance, ignorance, greed, and disobedience of God. Their solution is to correct traditional Christian doctrine and restore Christianity as a guide to humanity. They seek a balance between biology and the Bible, looking for ways to incorporate scientific knowledge into a religious worldview.

**Creation Spirituality** adopts cosmological physics as a starting point, reorienting the creation story around the creation of the universe. This model rejects the traditional hierarchical relationship between humans and nature, establishing instead that humans are merely one part of the whole of creation. In contrast to Christian Stewards, Creation Spiritualists point to anthropocentrism, human alienation from nature, and the artificial separation between religion and science as causes of ecological problems. They aim to address the environmental crisis by creating a new worldview or religion that integrates spirituality and science and rejects the dualism omnipresent in contemporary society.

**Eco-Justice** differs from both Creation Spirituality and Christian Stewardship in its focus on changing society’s institutions and structures rather than individuals. Adherents of Eco-Justice have expanded their traditional focus on social justice issues to include environmental degradation, especially as it relates to poverty, oppression, and injustice. Like Christian Stewards, their worldview is generally anthropocentric, but Eco-Justice Christians believe that environmental degradation results from institutional injustice and inequality rather than the sins of individuals. Therefore, their preferred method of addressing the ecological crisis is through grassroots organizing and government reform.

Islamic Environmental Engagement

Early ecologically-oriented Islamic thinking established the notion of *wahdat al-wujud* ("unity of being"), based in the verse, “Withersoever you turn, there is the Face of God” (Qur’an 2:115). In suggesting an alternative to the then-dominant anthropocentric viewpoint, however, orthodox Islam rejected this philosophy as dangerously approaching pantheism, or the belief that everything is God. Islamic environmental thinking has not figured prominently in contemporary discussions of religion and the environment, especially in the United States where the Muslim population is relatively small. Muslim writers typically characterize environmental degradation as stemming from a subset of humans (usually Westerners) taking more than their fair share of the world’s resources. Others tend to react to doomsday scenarios with a fatalistic trust in God, though some Islamic environmentalists have countered that God endowed humans with rational intelligence, which should be used to recognize crises and find ways to avert impending disaster. In general, however, mainstream Islamic thought focuses more on the relationship between Allah and humanity; the world and its environmental problems are merely a passing concern.

Despite this apparent disinterest, some Islamic environmentalists have in recent years published essays that ground a stewardship ethic in scriptural sources. They define environmentalism as a facet of the more general Qur’anic concept of stewardship (*khalifa*). In addition, they expand the notion of *tawhid* (or unity) from its historical interpretation as oneness of God to mean “all-inclusive,” establishing more...
equal grounding between humans and the rest of creation in opposition to the traditional hierarchical worldview. Others have highlighted passages in the Qur’an commanding the good treatment of animals and plants and condemning those who despoil the earth. Finally, Islamic environmentalists have also explored *hadith*, or narrations originating from the words and deeds of the prophet Muhammad, for instructions on environmentally-conscious behavior. For example, one scholar modernized a *hadith* enjoining Muslims from relieving themselves on public pathways or into water sources into a prohibition against pollution. The work of these Islamic thinkers provides a promising foundation for a more thorough probing of Islam’s relationship with nature.19

**Faith-Based Environmental Organizations**

ECOFaith is one of several dozen existing faith-based environmental organizations operating in the U.S. Due to the relatively recent emergence of this movement, however, few scholarly articles have critically studied these groups. One article by Smith and Pulver,20 based on research conducted by Smith,21 provides an analysis of the organizations’ motivations and priorities.

**Motivations**

Several critics of the mainstream environmental movement have voiced concern over the movement’s preoccupation with political, technical, or legal solutions while neglecting to promote a broader, more sustainable environmental ethic.22 Faith-based environmental organizations with their ethical focus and moral command are therefore well-positioned to fill that void, and many of them are heeding the call.

Smith and Pulver conducted a study of forty-two faith-based environmental organizations from around the country, looking at groups that had a website and had been in operation for over a year. These groups operated nationally, regionally, and locally and had interfaith, ecumenical, non-denominational, and single-denomination memberships. Smith and Pulver’s research indicates that the groups view ethics-based work as integral to generating lasting environmental change. Furthermore, they see changing value systems as the particular specialty of the faith community, where influence over ethics is expectedly strong. Many of the groups’ founders were motivated to start their organizations because they felt the faith community’s response to environmental problems was inadequate. They saw a need to increase awareness of environmental issues among people of faith and not only organize them to act but encourage them to take leadership in solving environmental problems. Furthermore, they recognized that religion’s doctrinal basis for environmental stewardship and its moral and humanitarian focus could appropriately guide the environmental movement within the faith community.

**Priorities**

In their study, Smith and Pulver differentiated between “issues-based” and “ethics-based” environmentalism. Issues-based environmentalism addresses specific environmental issues such as climate change or biodiversity loss and urges action on that particular issue. Ethics-based environmentalism focuses on achieving attitudinal and behavioral changes by establishing a broader ethical framework through which actions and issues can be viewed. The researchers found that 76% of the groups studied tended to believe more strongly in the importance of ethics-based work, with only two groups leaning heavily toward issues-based work.

Nearly all participants in the Smith and Pulver study, however, believed that ethics-based and issues-based work should complement each other. None of the groups engaged in consciousness-raising or educational activities without also tying them to specific issues and actions, from lifestyle changes to
political advocacy or activism. Furthermore, groups recognized that ethics-based work occurs on a long timeframe and that some environmental issues may require immediate action. Those situations compel the groups to engage in issues-based work, though the products of this type of work are widely seen as less permanent than the products of ethics-based work.

Though perhaps more permanent, the results from ethics-based work are less measurable. Aside from reported personal testimonies, few objective methods exist of documenting the effects of ethics-based efforts since tracing, quantifying, and even recognizing changes in ethics is inherently difficult. While issues-based work is typically more quantifiable and hence more readily funded, Smith noted that the groups seem little swayed to change their goals or focus to access more money, believing that their true strength lies in ethics-based work. The researchers therefore stress the importance of developing measures to assess the effectiveness of ethics-based work, both to attract funders and to facilitate self-evaluation. Finding a suitable set of metrics therefore is one of the most significant challenges facing organizations undertaking ethics-based environmentalism.

**Greening of Worship Buildings**

**Greenhouse Gas Emission Accounting**

Via the release of greenhouse gases (GHGs), humans have contributed to the current and future net warming of the earth’s atmosphere. Scientists deem carbon dioxide (CO₂) to be the most important contributor to net warming, identifying the combustion of fossil fuels as its primary source. In the absence of overarching global treaties and action plans to address climate change, local and regional organizations must lead in reducing GHG emissions into the atmosphere.

Studies have characterized technology changes that contribute to mitigating climate change as “reducing demand for carbon-intensive products, increasing energy efficiency, and switching to low-carbon technologies.” Research shows that the buildings sector in particular has the potential to reduce CO₂ emissions over 40% at costs below $20/tCO₂. With 350,000 religious organizations in the United States and an estimated 50,000 congregations in California, the number of worship buildings in the United States encompasses a significant number of buildings and therefore has the potential to reduce GHG emissions considerably. Although ECOFaith itself has 21 organizations under its umbrella, the scope and applicability of ECOFaith’s measures and actions could be replicated across an extremely large community.

In order to assess how a particular building has increased its energy efficiency, an organization must conduct a baseline assessment. This GHG inventory is an accounting of GHGs “emitted to or removed from the atmosphere over a period of time.” The most widely-used international standard to conduct greenhouse gas accounting is the Greenhouse Gas Protocol. The protocol provides a framework of reporting standards and calculation tools that organizations can use to establish baseline GHG emissions and voluntarily report continuing emissions and mitigation efforts. The California Climate Action Registry (now known as The Climate Registry) developed a California-specific protocol based on the GHG Protocol. The GHG Protocol and the Climate Registry accounting tool, however, operate on a coarser level than ECOFaith would find useful, since it is designed primarily for corporations and community-level accounting. Nonetheless, since the GHG Protocol and the Climate Registry procedures give a solid framework within which to establish our own methods for GHG accounting in the worship buildings, we intend to use the GHG Protocol as the basis for conducting our own assessment of baseline GHGs and subsequent reductions. Because the ECOFaith pilot projects occurred without setting a baseline, we will use pre-project electricity, water, and gas bills to establish GHG baselines for these projects. For
subsequent churches engaging in projects, we intend to provide a tool for these congregations to establish their own baseline.

**The Role of Green Building and Retrofitting**

Buildings account for approximately 40% of all energy usage internationally; in the temperate region of Santa Barbara where heating and cooling loads are minimal, buildings still generate approximately 37% of energy use. Countering global climate change must therefore include changing the way the populace designs, constructs, and retrofits the built environment in order to more efficiently use energy and water and to minimize this enormous source of greenhouse gas emissions. Policies at the federal, state, and local level have strived to achieve this goal in recent years and to put into place financial incentives to motivate and support these initiatives. A barrier that religious institutions face when retrofitting, however, is a lack of funding. Moreover, because faith-based institutions are 501(c)3 tax-exempt non-profits, they cannot take advantage of incentives that rely on tax credits. Recently, however, more of the policies that promote improved building performance now allow not-for-profit organizations to take advantage of available incentives. Additionally, congregation members could take advantage of eligible incentives despite the institution itself not qualifying for a tax rebate.

Rating and certification systems for energy efficient building and design practices, such as the US Green Building Council’s LEED program, provide additional motivation for utilizing green building practices. The exponential growth in participation in these voluntary programs indicates not only the growing public concern with climate change and energy efficiency, but also the enhanced social and economic value placed on individuals, businesses, and communities that take responsible action to improve energy efficiency. While factors such as age of buildings, atypical occupancy patterns, or lack of financial resources for commissioning and auditing may preclude ECOFaith’s participating institutions from achieving certification, ECOFaith can utilize many valuable and technically applicable elements from each of these rating systems to improve their process, assess their projects and perhaps implement a small-scale certification system of their own.

**Federal Policy**

In June 2009, the House passed the **American Clean Energy and Security Act** (Waxman-Markey Bill HR 2454), which focuses on five aspects: clean energy, energy efficiency, reducing global warming pollution, transitioning to a clean energy economy and agriculture and forestry related offsets. While as of this writing the Senate has yet to pass the corresponding Kerry-Lieberman bill, a final bill should result in considerable actions for energy efficiency related to building, lighting, appliance, and vehicle energy efficiency programs. The bill sets target aggregate emissions reductions for GHGs 17% below 2005 levels in 2020, 42% in 2030 and a monumental reduction of 83% by 2050. The final form and implications of this bill, however, are largely dependent upon the outcome of the 2010 elections to the Senate.

- Section 202 of the bill would establish a building retrofit program (REEP) for residential and nonresidential buildings. The state-administered programs would fund the implementation, incentivizing, and initial capital for retrofits and utility-operated retrofit programs.
- Section 211 deals with lighting efficiency standards (mainly outdoor lighting) and would require that portable light fixtures be an Energy Star rated fluorescent, an LED or a CFL.
- Section 264 authorizes grants to private and non-profit organizations for the purpose of increasing the flow of capital and benefits to low-income communities, minority- and women-owned businesses and other projects located in low-income communities in order to reduce environmental degradation, foster energy conservation and efficiency, and create job and business opportunities for local residents.
California State Policy

The Global Warming Solutions Act, AB 32 is a bill passed in 2006 that aims to reduce greenhouse gas emissions to 1990 levels by approximately 15% from current emissions levels. The scoping plan details numerous strategies to achieve this goal, including the implementation of a cap-and-trade program, large reductions in transportation-related GHG emissions, an improved electricity and energy efficiency standard, auditing of the state’s largest industrial emitters, reduction and capture of refrigerants that have a high Global Warming Potential, preservation of forests for sequestration measures, improved efficiency in agricultural practices, and better management of waste and recycling in order to reduce methane emissions from landfills.40

- The Electricity and Energy section of AB 32 promotes a number of priorities: 33% of energy generation from renewable sources by 2020, bolstered use of combined heat and power, the 1 Million Solar Roofs campaign, promotion of solar hot water heating, green building practices and water efficiency initiatives.41
- The scoping plan upholds that energy efficiency is the greatest energy resource, and that investment in greening existing buildings can save business and property owners up to $0.60 a square foot, reducing per-square-foot energy costs by as much as 40%.42

Many of the implementation procedures of this bill are not finalized, however, and the upcoming state election could significantly impact them.

Title 24 is the California Building Standards Code that sets regulations governing the design and construction of all buildings, associated facilities and equipment. California first adopted the standards in 1978 and the State Legislature amends them periodically. The most recent 2008 standards went into effect January 1, 2010, and include changes to comply with AB 32 such as:

- Compliance through participation in New Solar Homes Partnership
- Added cool roof requirement for new roofs and reroofing of steep-sloped roofs
- Upgraded insulation requirements for roofs, walls and floors
- New and expanded credit requirements for energy efficient lighting, duct sealing, ventilation, building envelope, etc.43

Despite these amendments, many environmental groups voice concern that Title 24’s minimum efficiency standards are not stringent enough and encourage local municipalities to enact ordinances that hold contractors and developers to an even higher standard.

California passed AB 811 in 2008. This bill establishes financial districts for renewable energy and building energy efficiency. Under it, property owners can take out low-interest loans to complete solar installation or energy efficiency retrofits. Loans are paid back through property taxes. AB 474 expands AB 811 to cover water conservation measures as well.44

CPUC Long-term Energy Efficiency Strategic Plan (CLEESP, 2008) lists strategies and target goals to improve energy efficiency such as a reduction of 20% by 2015 and 40% by 2020 through improvements in HVAC, building envelope, lighting, heating, water heating and electronic and appliance plug loads.45

Regional Policy

The Community Environmental Council, based in Santa Barbara, established the Fossil Free by ’33 campaign in 2004 in order to motivate local citizens to do their part in helping California achieve the targets set forth in AB 32 and eliminate our dependence on GHG-emitting fossil fuels. They work closely with community groups to promote energy efficiency and conservation, and recognize the importance
of gaining the support and motivating the action of faith-based organizations such as ECOFaith in order to achieve this communal goal.

Applicable Financial Incentives

The CaliforniaFIRST Program is a statewide Property Assessed Clean Energy program authorized by AB 811 and AB 474 to provide financing for energy efficiency and renewable energy projects on residential and commercial properties. With this program, the property owner repays the cost of a clean energy project (between $5000 and $75,000) through a line item on their property tax bill with a repayment between five and twenty years.

EmPower Santa Barbara is a brand-new program that will provide upfront financing for county residents and businesses to green their property through a voluntary property assessment and improvements/retrofits such as attic/wall insulation, duct repair, lighting controls, HVAC systems, door/window improvements and sealings, tankless or solar thermal water heaters, low flow faucets and showerheads, and solar PVs. In line with AB 811, this low-cost financing would be paid back over 20 years as part of the property owner’s property tax assessment.46

The CPUC’s California Solar Initiative (CSI) is a small-scale feed-in tariff that provides considerable rebates for the installation of solar photovoltaic systems. Both the faith buildings as well as congregates who are homeowners are eligible for this incentive.47

Introductory Green Building Best Practices Research

The CEC body of research provides us with a solid start on our research for the development of a cost-benefit analysis tool identifying retrofitting priorities. Their studies have concluded that some of the most cost-effective energy efficiency retrofit measures for residential & commercial buildings to take are installing the following:

1. High efficiency tube fluorescent lighting (i.e. T8/electronic ballasts with reflectors)
2. Double pane windows
3. CFLs (due to the aggregate number, switching to these would result in by far the highest energy and cost savings overall)
4. High efficiency washers, freezers, and refrigerators
5. Energy Star-certified refrigerators
6. Heat pump space and water heaters (with insulation for the water heaters)
7. Automated lighting systems with occupancy sensors
8. Office equipment power management
9. Low-flow toilets, showerheads and faucet aerators48

The CEC also identified the most effective conservation measures that both individuals and businesses can take to significantly contribute to energy savings in our region. These simple, actionable lifestyle changes are just a few of the many that can be integrated into ECOFaith’s education plan in the promotion of energy efficiency amongst congregation members. These include setting the water heater thermostat to 120 degrees, setting heating thermostats to 68 degrees when home and lower when away, closing heating vents in rarely used or unused rooms, turning off lights upon leaving a room, using energy-saving settings on appliances, air-drying clothing, and fixing leaky faucets and toilets.49,50
Green Building Rating Systems

The U.S. Green Building Council developed and maintains the Leadership in Energy and Environmental Design (LEED) rating process, the dominant national standard in green building practices and certification. Many of the approaches encouraged through the LEED certification process take advantage of the synergistic effects on energy use reduction. Some of the credit strategies that ECOFaith could utilize are:

- Establishing an alternative transportation plan
- Reducing heat island effects (e.g. through landscaping, permeable paving, green roofs, etc.)
- Improving indoor plumbing fixture and fitting efficiency
- Planting water-efficient landscaping
- Implementing performance measurements such as system level metering (i.e., determining which appliances are using the most electricity)
- Evaluating on-site & off-site renewable energy options
- Optimizing energy efficiency performance using energy modeling software
- Creating a sustainable purchasing policy and solid waste management policy
- Improving lighting
- Establishing a high-performance cleaning program

While most of ECOFaith’s participating members will not aim to achieve LEED certification for their worship buildings due to its scrupulous standards and in-depth process, the LEED for Existing Buildings: Operations and Maintenance framework may be an excellent tool to follow in determining Best Practices for building retrofits component of ECOFaith’s process.

Carbon Calculators and Other Measurement Tools

A number of programs exist for businesses and individuals to establish baseline CO₂ equivalent emissions; as a group, these tools are known as “carbon footprint calculators.” Some of the tools, which are almost all web-based calculators, seek to estimate an individual’s or a business’s carbon footprint through “an estimate of the carbon dioxide emissions that an individual [or business] is directly responsible for over a given period.”

A study of ten of these US-based carbon calculators found that:

> Although these calculators employ similar approaches to CO₂ estimation, their results often vary, even when using uniform inputs. These variations may be due to differences in calculating methodologies, behavioral estimates, conversion factors, or other sources. However, the lack of transparency makes it difficult to determine the specific reasons for these variations and to assess the accuracy and relevance of the calculations.

The lack of transparency in existing carbon calculators and seeming irrelevancy of many calculators for faith-based organizations led us to conduct our own assessment of these tools in relation to our proposed software. Below, we list the carbon calculators that seemed most applicable to faith-based institutions and explore their strengths and weaknesses. While our review does not provide exhaustive coverage of the tools currently available, we believe that the selected calculators most closely align with the needs of ECOFaith’s participating institutions in terms of scope and depth. We then explore how our own process and software would better serve the needs of ECOFaith than these current tools.
Interfaith Power and Light Carbon Calculator, Carbon Checklist and Action Menu
(Found at: http://www.coolcongregations.com/)

Interfaith Power & Light is one of the largest groups dedicated to “energy conservation, energy efficiency, and renewable energy” in faith-based institutions. It has a California chapter and accepts all faiths into a larger eco-stewardship, creation care-focused path. 480 congregations belong to California Interfaith Power & Light. The carbon calculator is one of the tools encouraged to promote behavior change. The overall strengths of the its carbon calculator and tools are that it is specifically tailored to the faith community, shows overall carbon measured in pounds of CO2 per congregant, acres of land use equivalent, and how many developing world congregations could be supported on that amount of energy, and also provides a simple congregant carbon footprint calculator as well as checklist for church and individual action items. However, its weaknesses include a lack of flexibility in input unit measurements, no cost-benefit analysis or recommendations of how to proceed, low transparency, and no way for churches to benchmark progress.

Cool California Small Business Carbon Calculator and Action Plan
(Found at: www.coolcalifornia.org/business-calculator)

This carbon calculator provides an appreciable level of detail (e.g., level of specificity in location, # of employees, square feet, employee commute miles, waste in cubic yards, % of electricity from clean energy program, etc.) and does provide some actionable items, scalable discount rates, and in some cases it shows certain assumptions allows the user to change assumptions. However, overall the calculator does not provide enough breadth since it only has three levels of inputs (transportation, facilities, procurement). In addition, the tool makes wide assumptions about procurement based on total annual revenue, which is not applicable to religious organizations, and does not yet incorporate recycling and water portions.

Energy Star Program Portfolio Manager
(Found at: http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager)

Energy Star has a baseline assessment and management tool called Portfolio Manager. Energy Star also has an Energy Star for Congregations program which aims to give congregations “free, unbiased information and technical support from ENERGY STAR, [to] more easily improve stewardship of your budget’s energy dollars, and of the earth by reducing energy waste and energy costs, while protecting the environment,” including a guide for action and other resources. In California, 424 congregations belong to the Energy Star for Congregations program.

The Portfolio Manager is designed to be consistent with the GHG Protocol in terms of accounting, inventory, and reporting methodologies, and has a separate ‘Houses of Worship’ category. The tool creates a portfolio that could be used for all ECOFaith institutions as a whole and/or separately, requiring a year’s worth of utility bills which gives good benchmarking against standards for the US as a baseline indicator. The tool tracks progress over time and also gives guidelines for energy management.

However, Energy Star has a number of weaknesses that would not allow it to be an effective tool for ECOFaith. For example, the Portfolio Manager and Energy Star for Congregations are not linked to each other in a comprehensive program to provide GHG accounting and analysis of reduction actions in the same place. Also, the tool is difficult to use, especially for those not trained, and given the low amount of inputs, accuracy may be sub-par. Water footprints are not included in this analysis. While there are some suggestions for efficiency actions, the tool does not provide a cost-benefit analysis either.
Additionally, ECOFaith may wish to model their process and goals after certain aspects of the Unitarian Society of Santa Barbara’s (USSB) Energy Element of their Facilities Master Plan.\(^5^7\) To the extent that ECOFaith’s goals align with methods employed by USSB and to the extent we find these methods to be scientifically sound, methodologically reasonable, and applicable to ECOFaith institutions, we will include some of these methods and actions within the new, refined ECOFaith process.

In sum, the carbon calculators and current programs that currently exist to establish GHG baselines and that provide frameworks for improvement would not serve ECOFaith effectively, because none of these provides a coherent program for faith-based institutions that includes a complete process, an individualized cost-benefit analysis of options, or a way by which to measure achievement. Our group project seeks to fill this gap by providing a streamlined process and toolkit to achieve greenhouse gas reductions both in houses of worship and through education. Our carbon calculator for baseline emissions and cost-benefit analysis tool will be a comprehensive look at GHG emissions specifically tailored to faith-based institutions, and our process will also include evaluation of education plans. With this ‘one-stop-shop’ approach, we aim to give ECOFaith the instruments necessary to effectively plan and evaluate their projects.

**Greening of Congregations**

**Connections between Environmental Awareness, Values, and Behavior**

According to its mission statement, one of ECOFaith’s goals is to “educate and encourage [its] congregations to adopt environmentally sustainable lifestyles as a dimension of spiritual practice.” Popular movements describe environmentally friendly behavior with the slogan “think globally, act locally,” meaning that the small-scale, day to day choices made by individuals and groups can add up to achieve global protection. ECOFaith educates its community members in order to promote a better understanding of environmental threats and encourage a willingness to reduce those threats as part of a spiritual responsibility towards Creation. This section explores sociological behavior models that show that education based entirely on facts may not successfully shape behavior and explains how education coupled with an appeal to value systems may cause significant and lasting positive changes.

Many studies have investigated the effects of education on environmentally friendly behavior changes in individuals. Behavior models from the 1970s generally assumed a linear progression where an increase in environmental awareness through education leads to an increase in pro-environment attitudes, which in turn leads to increase in pro-environment behavior.\(^5^8\) Research has since shown that the correlation between improved awareness and environmental behavior is weak; an individual will not necessarily change her lifestyle to be more environmentally friendly after she learns how her actions impact the earth. Carter (2008) examined this relationship by evaluating the actions by participants in a conference on environmental issues both before and after the event.\(^5^9\) While her results showed some increase in environmentally favorable behavior following the conference, the low survey response rate, self-reporting bias, and the conference’s original self-selection bias made it impossible to form a statistically relevant conclusion on the source or size of the change. Her results showed a weak effect of education on behavior, even less strong than many would-be educators would consider as justifying their time and resources.

With the education-to-behavior linear model weakened, two new questions emerge. First, if education does not have a direct impact on behavior, does it at least have an indirect effect? Second, if education and issue awareness are not the main factors in driving behavior, what are? Several studies have
explored these questions. Barr (2003) investigated recycling and waste minimization in a residential area of the UK. While he found no significant correlation between these specific behaviors and general global environmental awareness, he did find a high correlation between more specialized knowledge about what is recyclable and the actual act of recycling. The greatest drivers of recycling behavior were convenience (areas with curbside pickup had much higher recycling rates than areas where residents had to take material to a central location) and social pressure (visible recycling bins and general social acceptance of the activity makes recycling much more common than waste minimization, which is less obvious to others). Barr’s results suggest that education can play a role in driving behavior, but administrators must specifically tailor the education to the desired action rather than focus on general or global needs, and they must show that the behaviors are socially acceptable.

Rajecki (1982) parallels Barr’s conclusion with a list of factors that can reduce environmental behavior even when the individual is well educated on the issue: 1) when an individual gains knowledge indirectly rather than through concrete experience; 2) when an individual gains knowledge in the somewhat distant past; 3) when the desired behavior conflicts with cultural or personal norms; or 4) when the knowledge is broad and vague and does not tie to a specific activity. Azjen and Fishbein (1980) also support the idea that social norms play a major role in defining individual behavior even when general values are more positive; a person may feel that climate change is a serious threat but is still unlikely to stop driving her car as long as doing so is socially acceptable. Blake (1999) states that a person’s environmental concern can only translate into environmental behavior if she can overcome three categories of potential barriers. First are individual barriers, such as motivation and level of interest; second are responsibility barriers where the individual must feel that she has both the means and the responsibility to act; and third are practicality barriers, where logistics such as time, money and resources prevent the change in question. If any of these barriers are present, the behavior will not occur even when the person is well informed and intends to act.

The studies we have examined thus far suggest that education best shapes behavior change when it is specific and focused on the action in question rather than made up of “big picture” ideas. Research also suggests that issue awareness is only one factor that shapes behavior; others include convenience of the action, the individual’s feeling of responsibility and influence, and social pressure. Barriers such as a lack of time, money, or power can block even the most interested individuals, so a successful education plan should also include information on available resources to reduce these burdens. As a faith-based institution, however, ECOFaith has the power to inspire people to change their behavior not only through education and reason but also by appealing to their personal value systems. Two studies suggest a two-dimensional axis model to describe individual value systems in regards to environmental behavior. The first axis ranges from “conservation” to “open to change” and the second from “self-transcendence” to “self-enhancement”; each quadrant is further divided into motivation types:
The researchers assigned individuals to a motivation type based on how strongly they personally identified and prioritized values such as “choosing own goals,” “inner harmony,” “social power,” et cetera. These studies both found that individuals who fall into the open to change/self-transcendence quadrant are significantly more likely to engage in environmentally friendly behavior. As a faith-based environmental organization, ECOFaith can appeal to its members to move into this quadrant if they are not already by connecting environmental responsibility and the need for social change to their spiritual faith. This tactic increases the chance of successfully changing member behavior, particularly when integrated with a well-designed education program as described above.

If ECOFaith carefully designs its educational process to harmonize with congregation members’ motivations as faith-based individuals, it can be a powerful tool in encouraging and improving environmental behavior. Therefore, ECOFaith congregation leaders should consider these models and observations when designing their education plan. The ideal system would provide specific, action-related information, where educators would present information in such a way that people perceive the encouraged behavior to be socially acceptable; remove potential barriers by showing how changes can be economically beneficial; and fit within reasonable time and resource constraints. To be effective as a faith-based organization, ECOFaith must conduct all the above within a larger, holistic framework centered around Creation. The potential for such an organization to effect deep and lasting behavior change is significant, and its work can help communities achieve a new environmental consciousness.

**Sociological Methods for Evaluating Education Programs**

In developing our methodology for evaluating the ECOFaith education programs, we explored a number of qualitative sociological techniques, including observations, interviews, focus groups, and surveys. The following section reviews these methods and discusses their relevance to our project.

Because the pilot project education programs already took place, we cannot use real-time observations to gather assessment information. Moreover, because this technique typically requires well-qualified, extensively-trained, objective observers, we do not believe it is an appropriate method for ECOFaith to evaluate its own performance.
In-depth personal interviews, on the other hand, can yield rich data and allow the interviewer the flexibility to explore topics in depth. Conducting interviews, however, can be extremely time-consuming and may not be appropriate given our and ECOFaith’s time constraints. Furthermore, the volume and detail of information from each individual interview may be too large to be manageable or useful for an organization and community already strapped for time and resources.

A third option is to hold focus groups. Focus groups are helpful in identifying and defining project problems, strengths, weaknesses, and recommendations as well as obtaining perceptions of project outcomes and impacts and generating new ideas. Their advantage over interviews is that they are less time-intensive and can foster group interaction that may stimulate richer responses and highlight conflicting opinions. While interviews can be a more appropriate tool to understand how attitudes and behaviors link together on an individual basis, we do not feel this benefit justifies the extra time required, nor do we see it as more important than the benefits offered by focus groups.

In conducting focus groups, practitioners must make a variety of decisions about group structure and dynamics to optimize for their research question. Such decisions include the size, makeup and characteristics, and quantity of focus groups as well as the way in which moderators should direct the flow of conversation. Focus groups typically last 1-2 hours and number between 4-15 participants, though experts recommend a group size of 6-10—large enough to keep discussion flowing but small enough so that all participants get a chance to speak. In terms of the type of participants to recruit, the group members should neither be too heterogeneous as to make them uncomfortable, nor too homogenous as to prevent a diversity of opinions. Generally, groups should be homogenous in the characteristics that affect the discussed topic and heterogeneous in features that are irrelevant to it, with the aim of representing every segment of the population related to the research question. Characteristics researchers should consider include respondents’ social class, age, cultural background, gender, and familiarity with the topic. Experts are divided on whether participants in a focus group should have pre-existing social connections or should be as unknown to each other as possible. Most maintain that pre-existing relationships between group members can prevent participants from talking freely and frankly with each other, but some assert that relationships allow people to better relate to each other’s comments and correct each other’s contradictions. In any case, the ECOFaith focus groups may not be able to avoid some degree of group member familiarity as participants will come from the same congregation.

Another key set of questions revolve around the focus group topic guide and group moderation. The topic guide is a list of topics or question areas that the focus group should cover and can range from a list of structured questions that the moderator should ask to a broad set of topics to which the focus group should respond. The content of the topic guide will establish how the focus group will address the research question, so researchers should give considerable thought to its development. Researchers should also decide how to moderate and record the focus group sessions. Some experts recommend one moderator to facilitate group discussion and another to take notes and ensure that recording devices function properly. Others, however, suggest that having a note-taker or observer can inhibit participation and responses as group members often perceive that person as an evaluator.

The sociological literature also provides a set of best practices for recruiting for, moderating, and analyzing data from focus groups. When recruiting, focus group practitioners should explain the reason for the study but only give a vague idea of the theme to be discussed so that candidates do not arrive with prefabricated opinions. To boost attendance, researchers can send written reminders as well as confirm by phone a few days prior to the meeting, though they should also recruit 20% more people.
than they expect to need in case of absences.\footnote{Incentives, such as food or other forms of compensation, can also increase participation rates.\footnote{During the meeting, moderators should promote debate, encourage participation by all group members, probe for details, move the conversation forward when it flags, keep the session focused, remain neutral, and avoid giving personal opinions.\footnote{Most of all, moderators must maintain consistency across focus groups.\footnote{Once the data has been collected, researchers should listen repeatedly to the complete discourse to gain an impression of the conversations as a whole, then group the data into identified themes, and finally synthesize the result from each theme, selecting quotations that capture the main ideas expressed in the focus groups.} Once the data has been collected, researchers should listen repeatedly to the complete discourse to gain an impression of the conversations as a whole, then group the data into identified themes, and finally synthesize the result from each theme, selecting quotations that capture the main ideas expressed in the focus groups.}}

While we can gather information from a larger number of participants with focus groups rather than individual interviews, it is still not typically possible to generalize from focus group data\footnote{While we can gather information from a larger number of participants with focus groups rather than individual interviews, it is still not typically possible to generalize from focus group data. Therefore, we would like, time permitting, to get a more representative if less in-depth sample of the entire ECOFaith congregation. To this end, a survey, which can gather a small amount of information from a large number of people, may be the most appropriate mechanism. Furthermore, results from the focus groups can help us determine the most effective questions to ask on a survey.} Therefore, we would like, time permitting, to get a more representative if less in-depth sample of the entire ECOFaith congregation. To this end, a survey, which can gather a small amount of information from a large number of people, may be the most appropriate mechanism. Furthermore, results from the focus groups can help us determine the most effective questions to ask on a survey.\footnote{Surveys are a huge undertaking and require a significant amount of time and resources. A typical questionnaire can take up to seven weeks to develop and administer. We address the major steps for conducting a survey in our Methodology and Deliverables section.}

Surveys are a huge undertaking and require a significant amount of time and resources. A typical questionnaire can take up to seven weeks to develop and administer. We address the major steps for conducting a survey in our Methodology and Deliverables section.

Primary concerns for quantitative data collection methods such as surveys include the problems of sampling error, sample bias, and response bias. Sampling error results from using a sample rather than the entire population under study. While it is nearly impossible to sample the entire population, maximizing sample size can reduce sampling error. Sample bias occurs when members of the sample provide incomplete information or do not participate. Two methods to correct for this type of error are to repeatedly attempt to reach out to non-respondents or to compare the characteristics of non-respondents with respondents to describe any differences that may exist. Finally, discrepancies between true opinions or behaviors and survey responses can cause response bias. These deviations may result from participants misunderstanding the questions or choosing not to answer truthfully. Focus groups and pilot testing questionnaires can help to mitigate this type of error.\footnote{Primary concerns for quantitative data collection methods such as surveys include the problems of sampling error, sample bias, and response bias. Sampling error results from using a sample rather than the entire population under study. While it is nearly impossible to sample the entire population, maximizing sample size can reduce sampling error. Sample bias occurs when members of the sample provide incomplete information or do not participate. Two methods to correct for this type of error are to repeatedly attempt to reach out to non-respondents or to compare the characteristics of non-respondents with respondents to describe any differences that may exist. Finally, discrepancies between true opinions or behaviors and survey responses can cause response bias. These deviations may result from participants misunderstanding the questions or choosing not to answer truthfully. Focus groups and pilot testing questionnaires can help to mitigate this type of error.}
Methodology and Deliverables

The overarching goal of our project is to evaluate the ECOFaith process for greening churches and their congregations and provide recommendations fitting the needs and abilities of faith-based institutions. To accomplish this, we will analyze the planned actions and implemented changes for four pilot projects in terms of building efficiency and member education. We will use this information to:

- Quantify and evaluate the actions taken and resulting GHG emissions reduced for each of the four pilot projects
- Develop a toolkit that will help the organization in planning, implementing and evaluating future projects

Methodology: Analysis of Pilot Projects

I. Analysis: Greening of Worship Buildings

1. Our first step will be to meet with community leaders to review their published renovation plans and determine the current status of each of the pilot projects. For each project, we want to determine:
   - Which of the planned actions have been implemented and which have not
   - The approximate date that specific changes were put into place
   - Of the changes that have not yet been implemented, which they have decided are not currently feasible and which they still hope to complete
   - What is blocking them from completing the above items
   - How they chose and prioritized the actions they did complete

2. Once we are familiar with the status of each project, we will perform a quantitative analysis of the resulting changes in GHG emissions. These assessments will be based on:
   - Utility bills (electricity, gas, and water) for a year before and after implemented changes
   - Suggested inputs on congregation energy use from Cool Congregations, Energy Star, and other carbon calculators

   All data will be compiled and converted into CO2 equivalents for the sake of comparison.

3. With the help of ECOFaith Project Director Ed Bastian, we will identify two or more congregations in the organization that did not conduct a pilot project to act as a control group for statistical analysis. We will gather similar data on energy use and perform a BACIPS (Before-After-Control-Impact-Paired Series) analysis to separate out normal variation and determine if a statistically significant reduction occurred.

   Note: The Islamic Society does not currently have a building of its own, but it is working through the development process. We will evaluate their planned structure and compare it to a typical building of similar size and use to determine the level of offset emissions.

   * Literature review needed: We will investigate the best ways to calculate CO2 equivalents and estimate the energy use of hard-to-quantify building characteristics.

II. Analysis: Greening of Congregations

1. Our first step will be to meet with the congregation and education leaders for scoping interviews. The primary focus of these interviews will be to determine:
   - How their faith has shaped their environmental values
   - The goals and motivations of the leaders in creating their education plan
   - What beliefs or ideas they hope to instill in their congregation
2. Our next step will be to conduct focus groups with congregation members, including:
   - Participants and non-participants in the education program
   - A demographically representative sample of the congregation
   We will use the information gathered during our scoping interviews to shape the questions we ask congregation members. Our goal in these interviews is to determine:
   - How faith plays into opinions and feeling of responsibility towards the environment
   - Reasons that individuals chose to participate or not participate in environmental educational activities led by the institution
   - Member knowledge and interest in environmental issues and how it may have changed due to the institution’s education plan
   - How environmentally-related behavior may have changed due to the education plan
   - Any other ways the institution’s environmental stance affects congregation members
   We will follow the procedure below to conduct the focus groups:
   - Work with congregation leaders to identify and recruit 12-20 focus group participants from each pilot congregation, selecting members based on each congregation’s demographics
   - Hold two separate one- to two-hour focus group sessions, one with congregation members who participated in the education program and one with congregation members who did not
   - Record the sessions using an audio recording device
   - Once data collection is complete, analyze the entire discourse for impressions of the conversation as a whole, group the data into identified themes, and synthesize the result from each theme, selecting quotations that capture the main ideas

3. If time permits, we will conduct a survey of the whole congregation. Survey questions will be based on common issues that emerged during the focus groups, and will allow us to gather a more comprehensive picture of the congregation at large than a selected focus group could provide. We will administer the survey through pencil and paper forms following weekly church services in order to improve response rates and time. Our procedure for conducting the survey is as follows:
   - Determine the survey objectives
   - Create a survey project plan
   - Ask permission to collect data from the congregation members
   - Develop the questions to achieve the survey objectives
   - Create response choices for rating scales
   - Put the questionnaire together
   - Pilot-test the survey
   - Administer the survey
   - Analyze the data

4. We will collect and analyze CEC pledge cards that were distributed to congregation members at the start of the pilot projects. We will attempt to determine if congregation members that signed pledges followed through with actual lifestyle changes, allowing us to analyze the effect of a pledge system on behavior change in a faith-based community.

5. After completing the focus groups and survey, we will compare the information gathered from the leaders to information from the congregation members. We will try to identify:
   - How well the education plan and pledge system succeeded in achieving leaders’ goals
   - Gaps in the education process as a result of miscommunication, where information was either not presented by leaders or not understood by members
• Misalignment in interests or values of leaders compared to members that results in a disjointed or ineffective educational experience
• Changes in behavior, values or motivation that resulted from the experience
• Which aspects of the program were especially effective in eliciting changes
* Literature review needed: We will further investigate best practices for conducting focus groups and interviews so that they are accurate and informative.

**Deliverable: Report of Pilot Project Accomplishments**

When our data collection and statistical assessment are complete, we will include these in a quantitative report that outlines the actions performed by each congregation. This report will:
• Quantify the water, energy, and greenhouse gas reductions achieved in the pilot projects
• Analyze interview and survey data to determine how member knowledge, values, and actions were affected by the four pilot projects’ education plans

**Methodology: Improving Future Projects**

III. Refinement of ECOFaith Process
1. We will begin our review of the current ECOFaith process by discussing our findings from the greening of worship building and greening of congregation analysis phase with the congregation leaders. We will seek their input in identifying areas where they have been successful and where they see opportunities for improvement.
2. Based on our quantitative report and our discussion with institution leaders, we will develop a series of recommendations outlining how ECOFaith can refine its process (see Deliverables). The purpose of these recommendations is to assist ECOFaith in improving its efficiency and effectiveness in promoting environmental change, and to help the organization develop ways to track its progress for use in media and funding campaigns.
* Literature review needed: We will investigate organization and leadership best practices.

IV. Development of Toolkit for Future Projects
1. Once all our evaluations are complete, we will develop a cost-benefit tool for ECOFaith to use on future projects. To build this tool, we will consider our quantitative report data and will incorporate financial information:
   • Subsidies and incentives available to faith-based institutions that can help defray the costs of implementing changes
   • Portion of budget each institution has allocated towards environmental efforts
   • Costs of changes thus far, and money saved in reduced utility bills
2. We will also research the best opportunities for making cost-effective changes by further investigating the options for a focused list of action items, including:
   • What other faith-based institutions have done to reduce their emissions
   • Details of water, lighting, HVAC, etc.
   • Non-building reduction and offset options such as carpooling and tree planting
   • The effect of observed and potential member behavior changes on emission reduction
3. We will incorporate our education recommendations, calculated data, financial constraints, and available options into the final product: a refined process and a software tool that will suggest the most efficient options given a specific budget, or the budget necessary to achieve a specific level of reduction.
4. Based on information gained from focus group interviews, we will develop a series of recommendations for faith leaders seeking to increase environmental awareness and motivation in their congregations. These recommendations will focus on:
   - Themes and commonalities in congregants’ baseline interests, values, and knowledge
   - Methods for connecting with different types of individuals, as determined by pilot project successes and a literature review of best practices in education and marketing

5. We will develop a method for ECOFaith to evaluate the success of its educational programs. This method will be based on:
   - Our experiences conducting focus group interviews and surveys, and the quality of the information each method provided
   - Other evaluative criteria as determined by education literature review

**Deliverable: Toolkit for Future Projects**

To enhance ECOFaith’s efficacy in future projects, we will develop a toolkit consisting of:

1. **Revised Planning and Implementation Process:** We plan to revise the process by which ECOFaith plans, executes, and evaluates its projects by doing the following:
   - Incorporate institution limitations early in the process to avoid wasting planning energy on unachievable actions
   - Improve goal-setting as a way of motivating members and encouraging follow-through
   - Develop a protocol for collecting baseline emissions data before a project is implemented
   - Improve methods of ongoing monitoring and follow-up as a way to track progress

2. **Software Tool:** To help faith institutions green their worship buildings, we will design a tool that will establish a GHG baseline profile and conduct a cost-benefit analysis of possible actions (see Appendix II for details). The software will provide the following features:
   - Checklist of possible actions that can be included in planning; actions that are infeasible or not applicable can be removed from consideration
   - Input options for baseline conditions
   - Input options for budget cap or reduction goal that can be used to constrain analysis
   - Calculated action plan that considers input data and lists most efficient and effective actions
   - Calculations detailing cost of plan, tons of CO₂ equivalent reduced, level of reduction per dollar spent, and return on investment timeframe
   - Usable and useful for individuals who are neither computer nor green-building savvy
   - Flexible and transparent in terms of data inputs and calculations
   - Able to function independently without continuous outside support

3. **Revised Education Planning:** We hope to enhance ECOFaith’s ability to green its congregation members by doing the following:
   - Provide education leaders with information detailing the successes and opportunities of current projects as determined by interview and survey data
   - Develop a process that allows education leaders to follow up with participants, track progress, and adjust lessons as needed
## Milestones

### Spring 2010

- **May 18**: Submit draft proposal to Oran, Christina Tague, and Amy Burgard
- **May 25**: Peer feedback meeting on proposal
- **May 28**: Submit final proposal to External Advisory Committee
- **June 4**: External group website completed
- **June 8**: Meeting with External Advisory Committee to review final proposal
- **June 11**: Turn in summary of proposal review
- **June 11**: Preliminary GHG assessment of pilot projects completed

### Summer 2010

- **Ongoing**: If CGIU grant approved, potential for internship to begin developing software and developing focus group/survey
- **Summer 2010**: Develop independent literature review summaries of potential action items for GHG reductions
- **Summer 2010**: Develop focus groups and survey questions

### Fall 2010

- **Conduct focus groups and surveys for each pilot project**
- **Conduct statistical analysis on GHG reductions for each pilot project**
- **Extensively research CO2 equivalents and costs for inputs**
- **Develop algorithm for cost-benefit analysis**
- **Begin software development and implementation**

### Winter 2011

- **Continue to develop software, attaining reach goals if feasible**
- **Create project poster**
- **Run usability tests on software**
- **Complete future process draft**
- **Draft project brief**
- **Defend project**
- **Submit final report, toolkit, presentation, and poster to Oran and External Advisory Committee**

### Spring 2011

- **Present at Bren Group Project Final Presentation event**
- **Print project poster and briefs for all involved parties**
Management Plan

Group Roles and Management

Project Manager (currently Christine Chen)
This is a rotating position, with one person as Project Manager during Spring Quarter, one during Fall Quarter, and two group members splitting Winter Quarter. Project Manager responsibilities include:
- Setting and distributing the agenda for each meeting
- Leading meetings according to the agenda
- Scheduling and calling group meetings
- Developing a project plan with deadlines and owners for each deliverable
- Ensuring that deadlines are met

Web Manager (currently Stephanie Dolmat-Connell)
Responsibilities include:
- Designing and developing the group’s external website
- Responding to any internal or external website-related requests

Financial Manager (currently Jessica Golman)
Responsibilities include:
- Developing and maintaining the project budget
- Managing financial transactions and handling reimbursement requests
- Contracting with vendors

Recording Officer (currently Sarah Siedschlag)
This is a rotating position with a different Recording Officer each quarter. Recording Officer responsibilities include:
- Recording meeting minutes during each meeting
- Uploading the meeting minutes to the group’s internal website

Data Manager (currently Christine Chen)
Responsibilities include:
- Managing the group’s server space and shared Dropbox folder
- Developing naming, storage, and permissions conventions for the group’s data
- Managing the group’s internal website

Client Managers (currently Jessica Golman and Stephanie Dolmat-Connell)
Client Manager responsibilities include:
- Acting as the main points of contact for the client
- Updating the client on the progress of the group’s work
- Leading meetings with the client

Editor (currently Sarah Siedschlag)
This is a rotating position with a different Editor for each quarter. The Editor is responsible for the following:
- Compiling written pieces by individual group members and creating a consistent, logical, and organized final product
• Establishing writing style guidelines for the group as needed

Meeting Management

Regular meetings will be held twice a week: one hour-long meeting with the group members and their advisor and one 1.5-hour meeting with just the group members. Regular meetings will be scheduled at the beginning of the quarter depending on the group members' and advisor's availability. Additional meetings and meetings with the client will be scheduled as needed.

Prior to each meeting, the Project Manager will send out an agenda to meeting attendees. Each meeting will be run by the Project Manager according to the agenda. The Recording Officer will record the meeting minutes from each meeting and upload them to the internal website.

System to Meet Deadlines

Each quarter, the Project Manager will create a project plan with deadlines and owners for each deliverable for that quarter, according to the Deliverables and Milestones sections of this proposal as well as the group's input. The project plan and current status on each deliverable can be viewed at the group's internal website at any time. During each group meeting, the Project Manager will review the status of each upcoming deliverable and ensure that deadlines will be met. If a group member will not be able to complete the assignment by the deadline, they must inform the group as soon as possible and suggest a solution. Group members should only agree to assignments and deadlines that are feasible and inform the group in a timely manner if they are temporarily going to need a lighter work load.

Conflict Resolution Process

The ECOFaith team will abide by the following principles in order to foster a sense of cooperation and to avoid conflict:

• Show respect for one another
• Encourage equal participation by all team members
• Refrain from venting group project-related frustration to Bren students outside the group
• Foster openness and honesty and engage in active listening

If a conflict does arise, however, the following steps will be taken:

1. The injured party will individually approach the injuring group member and address the issue professionally. The two parties will agree upon a solution to prevent the issue from recurring.
2. If the problem is still not resolved, the group member who is upset will bring the issue to the group. The group will have an open discussion and try to find a resolution.
3. If the issue still persists, the group will either bring the matter to their advisor, committee chair, or another relevant third party.

Data Documentation, Cataloguing, and Archival

We will be using Dropbox as our primary method of sharing files. Subfolders will be used to separate different categories of files (e.g. Literature Review, Proposal, etc.). Document deliverables such as the project proposal and final project report will be written in Microsoft Word (.doc or .docx). The Data Manager is responsible for maintaining order in the Dropbox folders.

An internal project website has been set up through Google Sites to track project administrative information, such as meeting minutes, schedules, to-do lists, the project plan, individual responsibilities,
and informal, collaborative documents. All group members have owner access to the Google Site and can make any changes as needed, but the Data Manager is responsible for overall maintenance.

In addition:
- Meeting minutes will be uploaded to the group’s internal website following each meeting.
- Group members will share their availability with the group via Google Calendar and keep their calendars up-to-date.
- The Financial Manager will keep the budget up-to-date on the group’s internal website, using an embedded Google spreadsheet.
- The contact database will be kept on the group’s internal website and updated by group members as they receive new contact information.

Guidelines for Interacting with Client and Other External Parties

The client can expect the following from the group:
- All interactions will be conducted in a friendly and professional manner.
- The group is dedicated to building a strong relationship with the client and the client’s community.
- The client’s unique needs and background will be incorporated into the project in both the planning and implementation phases.
- The group will work with the client to achieve consensus on all important decisions.
- The group will keep the client updated on the project’s process every few weeks or more frequently as needed through a password-protected blog on the group’s website. Furthermore, the client can provide feedback and input through comments on the blog posts.

Conversely, the group expects that the client will:
- Facilitate contact with other stakeholders and volunteer professionals
- Provide data and information relevant to project implementation
- Give feedback on work products
- Attend meetings as needed
- Allow the group to have final say in project planning and decisions

Overall Expectations of Group Members and Faculty Advisor

Individual group members will be evaluated on their respective contribution to the project, and the group as a whole will be evaluated on the quality of its work products. Furthermore, the faculty advisor expects that the group will:
- Submit documents or work products requiring response several days before the response is due
- Proofread and ensure the high quality of any documents submitted for feedback
- Write and present clearly, concisely, and powerfully

Conversely, the group expects that the faculty advisor will:
- Attend weekly meetings and notify group members via email at least 24 hours in advance if a meeting must be rescheduled
- Attend additional meetings with clients and/or other key stakeholders if needed
- Provide logistical and technical advice and feedback
- Mediate conflicts between group members or between the group and external parties if needed
Contacts and Professional Links

**Group Members**

Christine Chen  
cchen@bren.ucsb.edu  
650.380.7046  

Stephanie Dolmat-Connell  
sdolmat-connell@bren.ucsb.edu  
339.222.8348  

Jessica Golman  
jgolman@bren.ucsb.edu  
760.917.3606  

Sarah Siedschlag  
ssiedschlag@bren.ucsb.edu  
909.921.1099  

**Advisors**

Oran Young  
young@bren.ucsb.edu  
805.893.8747  

Simone Pulver  
pulver@es.ucsb.edu  
805.893.3396  

Zoe Elizabeth  
zoe@theclimateregistry.org  
213.213.1253  

Ivor John  
ivorjohn@cox.net  

**Client**

Ed Bastian, Ph.D.  
Director, ECOFaith Santa Barbara  
President, Spiritual Paths Foundation  
ed@spiritualpaths.net  
805.695.0104  

Pastor Wallace Shepherd  
2nd Baptist Church  
walsaint1@gmail.com  

Pastor Lynn Bruer  
Grace Lutheran Church  
pastorlyb@verizon.net  

Father Ludo DeClippel  
Holy Cross Church  
pastor@holycross.sbcxmail.com  

Norma Halim  
Islamic Society  
normahhalim@hotmail.com  

**Notable Organizations**

California Interfaith Power & Light  
220 Montgomery Street, Suite 450  
San Francisco, CA 94104  
allis@interfaithpower.org  
415.391.4214  

Community Environmental Council  
26 West Anapamu Street, 2nd Floor  
Santa Barbara, CA 93101  
cecadmin@cecmail.org  
805.963.0583  

The Climate Registry  
523 W. Sixth Street, Suite 428  
Los Angeles, CA 90014  
213.891.1444  

Walter H. Capps Center for the Study of Ethics, Religion and Public Life  
University of California, Santa Barbara  
info@cappscenter.ucsb.edu  
805.893.2562
Appendix I: Financial Information

Project Budget

<table>
<thead>
<tr>
<th>Total Budget</th>
<th>$1300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing</td>
<td>Posters and final report printing and binding ($300)</td>
</tr>
<tr>
<td>Human Subjects Research</td>
<td>Personal car mileage: (15 miles round trip * 4 pilots * 2 sessions) * $.50/mile ($60)</td>
</tr>
<tr>
<td></td>
<td>Food: (5 participants * 4 pilots * 2 sessions) * $5/person ($200)</td>
</tr>
<tr>
<td>Client Meetings</td>
<td>Personal car mileage: (15 miles round trip * 2 meetings * 2 drivers) * $.50/mile ($30)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Phone calls, software, etc. ($400)</td>
</tr>
<tr>
<td>Total Cost of Project</td>
<td>$990</td>
</tr>
<tr>
<td>Estimated Remaining Funds</td>
<td>$310</td>
</tr>
</tbody>
</table>

Appendix II: Software Features

Planned features of the software tool outlined above are as follows:

**Top priority (required deliverable)**

Cost-benefit analysis of actions that reduce GHGs for worship buildings: The costs will be based on the cost of implementation of each action item and the benefits will be in terms of GHG-reduction potential. The starting point will be either how much GHG reduction the congregations can achieve in terms of their budget, or how much investment would be required for a certain GHG reduction goal.

**Functional Requirements for Software**

**Inputs**

- The software presents a checklist of options a congregation wants to consider (before inputting baseline information). The user can decide to remove certain options if they are considered to be infeasible or not applicable
- The user inputs a budget or GHG reduction goal (different modes will exist for each)
- The user inputs baseline info (i.e. electricity bills, bulbs, insulation, number/type of windows, etc.)
- The software provides data about the cost of each option per unit (i.e., $/bulb changed)
• The software provides data about the GHG reduction benefit per unit (i.e. estimated tons of CO₂ equivalent reduced for each bulb changed)
• The user can adjust the time horizon for GHG reduction goals (i.e. a year, by 2020, etc.)
• The software provides data about financial savings and/or return on investment for different options

Outputs
• The software orders action options starting with those that provide the greatest GHG-reducing benefit for a given budget; OR
• The software chooses options that would achieve the stated GHG reduction goal and gives the cost and GHG reduction potential for each action

Other
• The software will allow the user to save data so that they can explore different scenarios
• The software allows the user to print out the plan

Usability Requirements for Software
• Should be easy-to-use for people who are not computer-savvy
• Should be easy-to-use for people who are not green-building savvy (i.e. the user interface could include pictures or links for more information)
• Should be self-supporting (will not require continual outside help to support it)
• Should be flexible (users can input new data as new scientific/technical information emerges)
• Should have an opt-out/in (override) option for each strategy evaluated/recommended.
• Should represent numbers in visuals (i.e. charts, graphs, pictures)
• Must work on a PC

Reach Deliverable (as time allows)

Project Evaluation Functionality
• The software will allow the user to save the project plan generated from the cost-benefit analysis and open it in “evaluation” mode
• The software will display a list of plan options and a way for user to indicate which actions were taken
• The software will quantify the actions implemented in terms of GHG reductions
• The software will display reductions against the goal in the plan in a visually-appealing manner

Stretch Deliverable (as time and expertise allow)

Incorporate Congregation Members’ Behavior Changes into Project Design and Evaluation
• Investigate the following: What would a goal for congregation members look like? What would baseline data look like? How would ongoing data collection happen? What type of data would be collected? What would this portion add to the process that the focus groups/survey portion of the education component does not already address?
Notes

18 Ibid.
19 Ibid.
20 Smith and Pulver (2009)
21 Smith (2006)
22 Shellenberger and Nordhaus (2004)
23 Smith (2006)
25 Ibid.
27 Ibid.

30 National Center for Charitable Statistics. (n.d.). Number of non-profit organizations in California, 1998-2008. Retrieved from http://nccsdataweb.urban.org/PubApps/profile1.php?state=CA. **The actual number of congregations reported (26,444) is estimated to be about half of the actual number since religious organizations are not required to report to the IRS.


Ibid.


47 Community Environmental Council (2007)

Ibid.


Ibid.
Ibid.


Ibid.


Ibid.

Ibid.

Ibid.

Ibid.


Gibbs (1997)

Flores & Alonso (1995)

Mahoney (1997)

Flores & Alonso (1995)

Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health & Illness, 16*(1), 103-121.

Mahoney (1997)

Flores & Alonso (1995)

Gibbs (1997)

Flores & Alonso (1995)

Ibid.

Ibid.

Gibbs (1997)

Ibid.

Ibid.

Ibid.

Ibid.

Ibid.

Ibid.

Ibid.

S. Anderson (personal communication, April 28, 2010)
89 S. Pulver (personal communication, May 7, 2010)
90 Ibid.