ENERGY STAR® Action Workbook for Congregations

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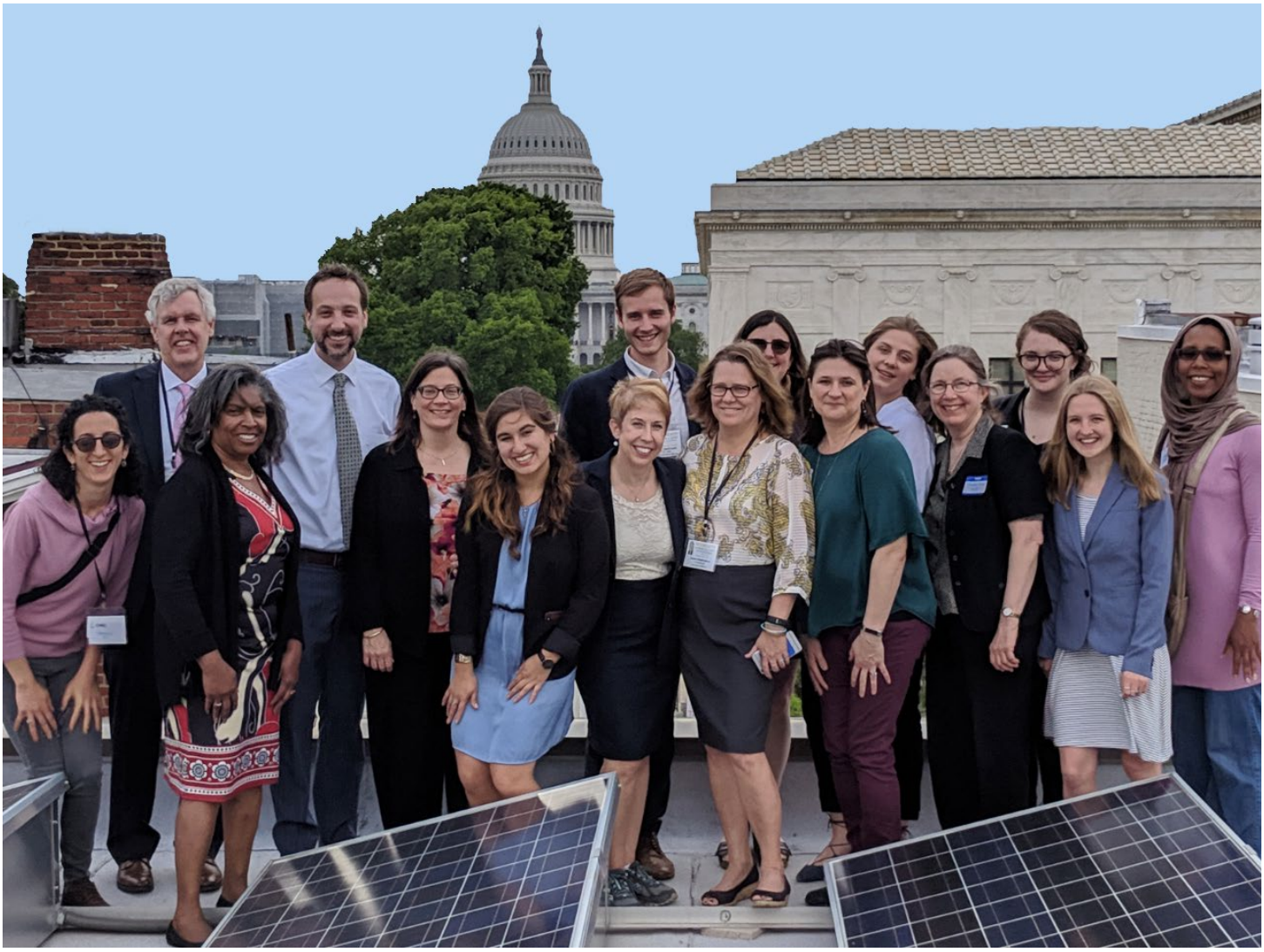

Interfaith Power and Light is partnering with EPA's ENERGY STAR to help people of faith and conscience achieve their goals to increase energy efficiency, reduce their carbon footprint, and care for our common home. *Learn more at* *www.interfaithpowerandlight.org*

This workbook is a perfect companion to Interfaith Power and Light's Cool Congregations program used by congregations nationwide to reduce energy use and climate pollution. *Learn more about Cool Congregations at* *www.coolcongregations.org*

About the Workbook

The United States (U.S.) Environmental Protection Agency's (EPA) ENERGY STAR® program and the U.S. Department of Energy's (DOE) Building Technologies Office (BTO) collaborated through the National Renewable Energy Laboratory's (NREL) Commercial Buildings Research Group to create this workbook.

This workbook serves as a resource and planning guide for clergy, staff, and laypersons of houses of worship who want to increase the energy and water efficiency of their facilities by implementing realistic and cost-effective energy improvement projects. It is available at www.energystar.gov/congregations.

Disclaimer

All energy, water, and monetary savings listed in this document are based upon average savings for end users and are provided for educational purposes only. Actual savings will vary based on energy, water, and facility use, national weather data for your locality, energy prices, and other factors. Greenhouse gas (GHG) emissions are calculated based on emission factors reported to the U.S. EPA by the electric utility provider serving your ZIP Code. Data referenced in this document is provided by the U.S. EPA and the U.S. DOE's NREL.

Interfaith Power & Light

A Religious Response to Global Warming

We have been very grateful for the partnership with the EPA ENERGY STAR for Congregations program, having used these resources for years to help congregations reduce their energy use, global warming pollution, and costs. We are now pleased to co-brand this valuable workbook and encourage many other congregations to use it to carry out their goals to care for our common home. The EPA resources dovetail nicely with Interfaith Power and Light's own Cool Congregations program.

Interfaith Power & Light (IPL) helps congregations address global warming by being better stewards of energy. The campaign has a track record of tangible results: shrinking carbon footprints and educating hundreds of thousands of people in the pews about the important role of people of faith in addressing this most challenging issue.

IPL invites congregations and individuals to set a reduction goal by signing the **Paris Pledge** to reduce emissions in keeping with the international climate accord agreed to in Paris. Sign the pledge at www.parispledge.org. Then use IPL's Cool Congregations resources to meet your pledge.

Our unique **Cool Congregations** stewardship program helps congregations across the nation engage their members in caring for the Earth by reducing congregational and householder global warming pollution and helps save hundreds of dollars in the process. IPL offers Start Up Kits that include the popular "25 Steps Under $25 to Save Energy". Find Cool Congregations on the web at http://www.coolcongregations.org/

The Cool Congregations Challenge is IPL's annual national contest to recognize congregations that are becoming energy efficient and sustainable role models within their communities. Enter to win $1,000 in five categories.

IPL offers a **Cool Congregations Certification** for congregations that reduce energy use by 10% to 40%. It's a great way to celebrate your congregation's accomplishments.

Global warming is one of the biggest threats facing humanity today. The very existence of life – life that religious people are called to protect – is jeopardized by our continued dependency on fossil fuels for energy. Every major religion has a mandate to care for Creation. We were given natural resources to sustain us, but we were also given the responsibility to act as good stewards and preserve life for future generations.

This valuable resource is a great help in serving out our call to care for our common home.

Rev. Susan Hendershot
President, Interfaith Power and Light

Interfaith Power and Light is a national network of 40 state affiliates whose mission is to inspire people of faith and conscience to take bold and just action on climate change. Read more and sign up for our newsletters at www.interfaithpowerandlight.org

369 Pine Street, Suite 700, San Francisco, CA 94104
Phone 415-561-4891 • *Fax* 415-561-4892 • *Web* www.InterfaithPowerandLight.org

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Introduction

Energy efficiency is the fastest, cheapest, and largest single resource solution for simultaneously saving energy, saving money, preventing GHG emissions, and saving water saves energy. Through the market-based, voluntary, ENERGY STAR program, the U.S. Environmental Protection Agency (EPA) is helping the commercial building sector improve energy efficiency where Americans worship, work, shop, play, and learn. These efforts have created jobs, saved money, and contributed to cleaner air and the protection of human health. These and future efficiency efforts are of critical importance, as commercial buildings are responsible for nearly 20 percent of all energy consumption in the U.S.

Thousands of American building owners and operators, including major corporations, state and local governments, school districts, universities, hospitals, and congregations are already using ENERGY STAR tools and resources to realize significant energy and dollar savings, all while preventing GHG emissions. This free, online "ENERGY STAR Action Workbook for Congregations" was developed to help congregations like yours use these tools and resources to strengthen financial and environmental stewardship.

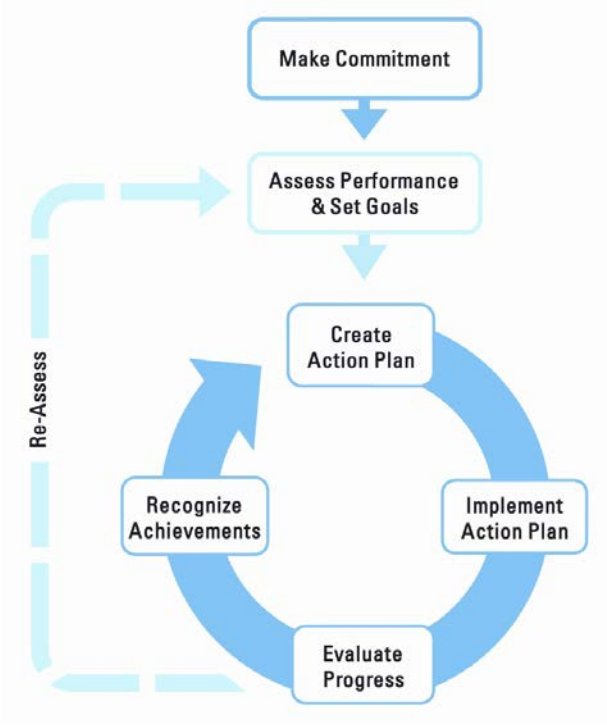


Figure 1. ENERGY STAR Guidelines for Energy Management

This action workbook walks you through the 7 steps of the proven ENERGY STAR Guidelines for Energy Management (Figure 1) tailored for worship facilities and provides a strategic approach to implementing projects that will improve your property's energy performance. Most of the steps described in the workbook do not require much time or money but are important in determining which actions make the most sense for your congregation. Often, simple operation and maintenance improvements requiring little or no investment can achieve significant savings.

The Workbook Appendices highlighted throughout include more in-depth information on specific technical items as well as resources to help you look at utility savings opportunities throughout your congregation. The ENERGY STAR Guidelines for Energy Management detailed in this workbook are summarized below. Let's get started!

Step 1: Make a Commitment

Become an ENERGY STAR partner and make a commitment to better stewardship.

Gain the support of your clergy, staff and governing board. They are critical to successful efficiency projects.

Motivate your congregation. Your congregation members can be the primary source of inspiration, finance, and labor for many energy efficiency projects. Help your members understand and participate.

Create a stewardship team. This "green team" can be large or small—or even a committed individual. Invite youth to contribute.

Step 2: Assess Performance

Benchmark, and start saving now! Track and analyze performance data using EPA's free, online Portfolio Manager®. This tool can help you set energy, water, and waste management savings goals, and document achievements, including pollution prevention.

Sign up for ENERGY STAR training and find recorded webinars.

Access the Portfolio Manager QuickStart guide.

Conduct a walk-through survey guided by "Sure Savers" to implement low- and no-cost, reliable, low-risk actions that your green team can take any time.

Step 3: Set Goals

Determine the scope of your goals; you can focus on a single property, or even specific equipment and/or a section of your congregation for your efficiency project.

Set and prioritize goals. Sample goals include 1) energy use reductions from baseline, 2) cost reductions, or 3) increased staff/congregant awareness of energy use and associated energy efficiency actions.

Step 4: Create an Action Plan

Define targets and projects. Use Portfolio Manager to compare your baseline with a national average, and the goals you set. The gaps between goals and your baseline can help identify projects.

Determine roles and responsibilities by identifying which steps of the action plan you will implement internally and for which you will need external help—such as contractors, consultants, and utility representatives.

Find funding for your projects. Take stock of your financial situation to understand how much you can invest in projects, including what is on hand, what could be raised quickly, and what could be found elsewhere. Check on utility financial incentives, and possible "shared savings" contracting.

Step 5: Implement the Action Plan

This is the time to hire a contractor if necessary, to negotiate based on competing bids, and name a congregation member or team to manage the projects. Portfolio Manager's powerful features can help you monitor progress and generate standard or custom reports to inform decision makers.

Create a communication plan to build awareness, educate, and motivate your members.

Manage the Action Plan. Establish a consistent method for tracking the progress of your projects and maintenance tasks.

Step 6: Evaluate Progress

Track progress. Monitoring progress helps your congregation look toward the future, create new action plans, evaluate which elements of your plan worked and which didn't, and set new performance goals.

Measure results and verify savings through a formal review of energy use data and the activities carried out to implement projects. Did the projects implemented through your plan help meet goals?

Review the Action Plan. What was successful in terms of ease of implementation, congregant support, as well as saving energy? What didn't work and what could have been done differently?

Step 7: Recognize Achievements

Provide recognition at regular intervals for everyone who helped the project succeed.

Tell your story. Share your success with other congregations and in your community through traditional and social media. Your story can inspire other congregations and community organizations to act.

People enjoy friendly competition that supports a good cause and inspires excellence. See the ENERGY STAR Guide to Energy Efficiency Competitions and Treasure Hunt resources.

Apply for the ENERGY STAR. Recognized by more than 90% of Americans as the mark of excellence in energy efficiency, environmental, and financial stewardship.

Welcome to the ENERGY STAR Action Workbook for Congregations!

Step 1. Make a Commitment

1.1 Advocate for Energy Efficiency

The prospect of increasing the energy efficiency of your worship facility may seem daunting at first. There may be concerns within the congregation that new technologies won't work as well as the old ones, or that they will change the appearance of your worship space. There may be doubts as to the validity of the energy and dollar savings expectations of your group. There may disagreements as to priorities, such as investing in costly high-profile improvements before low-cost/no-cost improvements. The appropriate sizing (and therefore the cost) of heating/air-conditioning or solar, or the payback on new windows are all highly dependent on the baseline level of efficiency. The first step toward improving your worship facility's energy performance is to educate the decision-makers that cost-effective, sustainable improvement of your building is achievable and in your best financial interest. Improving your building's energy efficiency will recover resources that your congregation can use to focus on its main missions. This section will explain:

- How energy efficiency relates to stewardship
- How to sell your project to decision makers and congregational members
- How to create a stewardship team

1.2 Why Energy Efficiency is Key to Your Stewardship Goals

Faith traditions teach the importance of stewardship of natural and financial resources. Below are just a few of the important potential benefits of strategic and cost-effective energy stewardship:

- Save money that can be redirected to the basic faith-inspired mission of the congregation.
- Reduce energy-related pollution that threatens human life and health directly, and indirectly through damage to life-supporting ecosystems.
- Conserve natural resources for future generations.
- Improve the overall comfort and appearance of your worship space.
- Extend the useful lifespan of your worship facility and its equipment.
- Increase the asset value of the facilities owned by your congregation.
- Support the credibility of capital campaigns by demonstrating that stewardship of funds is "practiced as well as preached".
- Improve the credit-worthiness of your congregation for financing new construction or remodeling.
- Engage the time and talents of congregation members, especially youth groups.
- Serve as a model of energy and financial stewardship for the homes and businesses of congregation members.

Money and Caring for Sacred Spaces

Congregations may not be concerned about the resale value of the worship facility, as they expect to inherit and bequeath care of the building over generations. However, the value of the building is an important factor in the congregation's financial strength when looking at funding or borrowing for expansion, remodeling, and maintenance. The vitality and diversity of the modern U.S. faith community also means that worship facilities are, in fact, often sold when congregations outgrow them. The growing incidence of repurposing commercial facilities into houses of worship may also increase the turnover in ownership.

The People: Stewarding the Stewards

Without the congregation of people, an empty, unused worship facility would be just a building. The living congregation brings together skills, knowledge, and productive passion. Many people can contribute to stewardship through their time and talents. Some members may bring professional engineering, architectural, or financial training; others may be skilled carpenters, gardeners, painters, electricians, or plumbers, or just be handy enough to get the job done right at no cost to the congregation. Any number of members, especially youth, may be looking for opportunities to contribute to the congregation and will be attracted to hands-on environmental stewardship.

When a congregation becomes serious about reducing energy waste, saving money, and preventing pollution, an inevitable question arises: What can members do in their own homes and businesses? Can't they also save money with energy efficiency? Yes, of course they can! ENERGY STAR is a resource for information specific to improving residential energy efficiency. Additionally, your congregation can hold classes to help members take the energy and money-saving knowledge and skills learned from your project home with them. Some congregations may want to hold friendly energy-saving competitions among members or with other local worship facilities. Small prizes (like LED bulbs) and recognition can be fun and can stimulate serious energy savings.

1.3 Sell Your Project

Introducing energy efficiency to your whole congregation is key to a successful energy project. It is essential that the leadership of your worship facility understand the importance and level of involvement the project will entail. In addition, be sure the congregation members are excited about the project. Promoting and selling the project to the members of the congregation up front will help the process run more smoothly and give confidence to those implementing it.

Talk to Decision Makers

In most congregations, one of the first and most important steps in implementing a new energy efficiency project is gaining the approval of the governing board and key staff. These positions may include the congregational governing board, facility caretaker, business administrator/treasurer, buildings and ground committee, and green team (if you have one). It is important that the facility caretaker and business administrator/treasurer understand that the new push for energy stewardship is in no way critical of past efforts. The project can offer a new level of recognition for any past efforts and for support of improvements they would likely have been implemented had the time, technical support, and finances been available. These people can be your strongest allies, and they will need to provide critical information on energy costs and the physical property as well. It is often better to ask for advice on an idea before offering a full proposal. Here are some key points that can help ensure success as you discuss your proposed project:

- **Explain the overall project in detail.** Before talking with those responsible for making decisions at your property, plan how you are going to present and advocate a change in operation and/or maintenance processes, property or equipment, and energy-consuming behavior. Make sure you are prepared to answer the following questions:
  - ✓ *Where do you notice room for improvement in your building's energy use?* These observations can address technology, infrastructure, and energy consumption habits.
  - ✓ *What benefits do you see the congregation gaining from an improvement in the building's energy use?* Consider immediate and long-term financial benefits, maintenance costs, personnel time and costs, convenience, and social benefits.
  - ✓ *What types of costs do you expect to encounter?* Consider financial, maintenance, personnel, and convenience costs.
  - ✓ *Who will be responsible for monitoring and managing the progress of your property's energy improvements?* Include all the potential parties.
- **Emphasize the savings.** The point in doing an energy efficiency project is stewardship, not only of the earth, but of your worship facility's resources and assets. Making smart choices on energy efficiency can save your congregation substantial money on a continuing basis.
- **Tailor the project to your worship facility.** An energy project is unique to your own congregation's needs, opportunities, and desires.
- **Highlight that you have many of the skills already on-site.** As you will see in this workbook, you can take advantage of the skills and abilities of your congregation members to do much of the needed work to improve the energy efficiency of your property.

Promote Energy Efficiency to Your Congregational Members

The congregation is not only the heart of the worship facility but also the main financial provider through donations and offerings. It is vital to the overall success of your project that the membership be involved in bringing it to fruition so that they have a stake in the outcomes. Although some congregants will be familiar with energy efficiency, not all will understand why it is important for the worship facility. Therefore, education is imperative. Here are a few key ways to get buy-in from your congregation:

Ohev Sholom, the first synagogue in the country to earn ENERGY STAR certification, focused on low/no cost efforts to improve energy efficiency. The key to the Washington District of Columbia-based synagogue's success was a focus on staff and congregant education and dedication to improving building operations.

- **Highlight environmental stewardship, along with financial stewardship, as part of the religious service.** Many religious leaders have never spoken to their congregation about stewardship of the earth and its relation to religious doctrine, despite clear guidance within most faith traditions of its importance. People increasingly understand the impacts on human life and health—before birth and throughout life—of pollution such as from mercury, carbon dioxide, and particulate matter.
- **Explain the project.** Don't hesitate to explain the project to your congregation. They will probably be pleased with efforts to improve the stewardship of your facility resources and to create a safer, healthier, and more comfortable place for worship.
- **Use multimedia.** Whatever type of multimedia is used in your worship service, it can be tailored to show the importance of environmental stewardship to human health and wellbeing. Whether it is done through skits, videos, songs, or scripture readings, caring for the earth can be a recurring theme. Ask your youth group for help with social media strategies.
- **Provide educational materials.** ENERGY STAR has a great deal of information on general energy efficiency that you can use to educate your congregation, including resources on strategy, products, and equipment.
- **Involve the congregation.** An energy project usually needs to be implemented from the top down, but the whole congregation can be involved. Different age groups can sign up to help implement various phases of the project that are appropriate, such as fundraisers, youth projects, and weekend work days.
- **Provide progress updates.** To create an enduring project, you need to update the congregation on its progress. How much money has the congregation saved on utilities? How have the saved funds been used to better the congregation? How have the efforts of all those involved contributed to improving the environment?

1.4 Create a Stewardship Team

Successful energy efficiency projects are tailored to individual congregational culture and resources. It is important to make these projects your own by taking advantage of existing resources or individuals who may already be undertaking efficiency efforts. A core team of dedicated individuals is behind most successful energy efficiency projects. For most congregations, two to three people may be the core of the stewardship team, while for larger congregations it could be five to ten people. A single individual may be the full "team" for a very small property and may simply need to take advantage of the skills of other members. A small group can reach consensus and start working quickly.

Regardless of the size of your congregation or of the property, the key to creating an effective team lies in finding enthusiastic people who will share the workload according to individual strengths, yet band together to overcome larger issues that may arise.

Plantation Baptist Church in Plantation Fla. was the first worship facility to earn the ENERGY STAR. Much of the energy savings at the facility is due to church staff managing energy onsite. For example, the church deacons are responsible for adjusting thermostats and turning off the HVAC units when not in use. Says Pastor Tom Hunter, "Our energy stewardship was motivated by our desire to obey the Word of God. A steward is someone who manages another's resources. We use the slogan 'Not wasting the Lord's money' to spearhead our energy management."

Who should be Included in the Core Team?

Several key positions and people should be represented in the core team. One person may have skill sets to fill multiple roles, but care should be taken not to overburden anyone. Because of congregational differences, people with key skills may have many different titles or no title at all. In many cases, individuals may be volunteers from the congregation. The roles described are intended only to identify and describe the key skill sets, but if titles are an important part of your organization, feel free to use them.

Recommended Core Team Members Roles and Responsibilities

Team Leader: The role of the team leader is to spearhead the project, assemble a strong team, and organize the team's efforts. This person is instrumental at getting the project off the ground and provides leadership throughout. The team leader should be able to clearly communicate the purpose of the project, attract other team members, and command respect and trust throughout the congregation.

Financial Representative: The financial representative should be familiar with the congregation's finances. This person should understand any financial constraints, the long-term plans and goals of the congregation, and should be able to communicate the project findings to the rest of the financial group or council. The financial representative should also take the lead in planning the project budget and securing funds, in conjunction with the congregation's treasurer or financial/accounting department.

Facility Operator/Caretaker: The facility operator or caretaker should understand the operations and maintenance procedures of the property. This person should be familiar with the current building condition and be comfortable making high-level observations in this area.

Publicity/Outreach Coordinator: The publicity/outreach coordinator is responsible for explaining the project and its progress to the whole congregation. This person should be comfortable speaking to groups and answering questions. Their enthusiasm will be important for recruiting other participants, as needed—dedication and enthusiasm can matter more than expertise in this role.

Technical Expert: The technical expert team member should be comfortable thinking about technical problems and projects. Engineers, architects, scientists, and contractors, even business leaders without a background in buildings, can be a good choice to fill this role.

Computer Facilitator: The computer facilitator should be comfortable sending and receiving emails, using the Internet, and viewing online videos. This person might also work with the publicity/outreach coordinator to create presentations to show progress to congregation members, either in person or through social media.

Voice of the People: The voice of the people should be someone who has a good relationship with many diverse members of the congregation, especially those who aren't typically engaged in the decision-making process. This person can float new ideas and gauge responses.

Youth Representative: Environmental issues can be of great importance to many of today's youth who understand they are inheriting the earth from their elders. The youth representative on the team should be a member of your congregation who is a leader in the youth community and is interested in contributing in the efforts to improve energy efficiency. This person can lead youth work groups or youth fundraising initiatives for the effort. Young people are often more interested and quicker to adapt to new software and electronic media—for example, social media, benchmarking with ENERGY STAR Portfolio Manager, and generating progress reports.

1.5 Review: Make a Commitment

Step 1 gave you the tools you need to get your congregation focused on improving your property's energy efficiency. You learned how improving the energy efficiency of your property is a form of stewardship, and how it will help your congregation meet other stewardship goals; you learned how to talk to your clergy, governing board, and congregation about energy efficiency and you learned how to create a stewardship core team. Now it's time for you to turn your words into actions! You can use the steps below to measure your progress towards completing Step 1.

1. **Become an ENERGY STAR partner and make a commitment**: This simple action takes a few minutes and sets you on your way with no obligation or cost. ENERGY STAR partners are plugged into the latest information on energy efficiency and have access to certain free technical support, case studies, tools, and public recognition of success.
2. **Gain the support of your clergy and governing board**: The clergy, governing board, and staff of your congregation represent the key facility decision makers. Their support is critical to successful projects.
3. **Motivate your congregation:** Your congregation members are the primary source of financial support for your property, as well as a source of time and talent for promoting and implementing many energy efficiency projects. Member understanding and involvement in projects will strengthen their commitment for your organization's stewardship initiative.
4. **Create a stewardship team:** This core team can be a large or very small group, or even an individual who is committed to moving the projects forward. Consider a contributing role for the youth group.

Step 2. Assess Performance

Benchmark and Start Saving NOW

It is necessary to know how your congregation is currently using energy in your property to help determine where to focus your team's efforts. Think about your property. Do you know the last time routine maintenance was performed on your HVAC system? Do staff and congregants always turn off items that are not in use? The answers to questions such as these should start to give you an idea of places where energy consumption can be reduced. Step 2 will show you:

- Why "benchmarking" is important.
- How to benchmark using the EPA's ENERGY STAR Portfolio Manager tool.
- The benefits of a technical walkthrough to identify Sure Savers.
- How to host an Energy Treasure Hunt.
- When to consider an energy audit.

2.1 Understand Benchmarking

Your benchmark provides a baseline from which your core team can plan, manage, and track improvement projects toward success.

ENERGY STAR® Portfolio Manager®

You can't manage what you don't measure.

ENERGY STAR Portfolio Manager is a free online tool provided by EPA that you can use to benchmark the current energy and water use of your property. With Portfolio Manager, you can calculate your building's baseline energy and water consumption, track your building's energy and water use over time, track your waste, and see how your property compares to other houses of worship nationwide through the 1 – 100 ENERGY STAR score. Armed with this information, the core team will be able to help your congregation make informed decisions on energy-efficient investments and continue to keep them informed about your progress.

By entering details about the property and consumption data for energy and water you can:

- Assess whole building energy performance.
- Track changes in energy, water, waste, GHG emissions, and energy costs over time.
- Track green power purchases.
- Create custom project reports.
- Share data with others.

To benchmark your property, Portfolio Manager performs calculations with your utility data, and adjusts for the weather in your area and for some specifics about the property systems, equipment, size, and building use. The 1 – 100 ENERGY STAR score that the tool generates shows you the energy efficiency of your house of worship from any given start date and reflects your progress. The core team can then use this information to set goals for your building's energy efficiency, and work toward receiving recognition for improvements if you qualify for ENERGY STAR certification (for buildings that score 75 or higher). Earning the ENERGY STAR indicates that your property is among the most efficient houses of worship in the U.S., but whether your congregation pursues certification or not, you can realize and accurately track significant savings using Portfolio Manager. For example, just achieving a 20% improvement can provide deep savings. By tracking utilities in Portfolio Manager, ENERGY STAR has found that buildings that start with a lower ENERGY STAR score/higher energy use can achieve the greatest savings by benchmarking. In fact, buildings starting with below average energy efficiency in 2008 (those with a score under 50) saved twice as much as those buildings that started above average. EPA prepared the DataTrends series to examine energy and water benchmarking trends for the thousands of buildings in Portfolio Manager.

Why Is Reducing Waste Important?
It can save you money, it highlights your environmental commitment to your congregants, and it reduces your environmental impact. Tracking the waste is an important step in reducing it. Here are some ways to cut down on waste:

- Don't print out a file unless it's necessary and print double-sided if possible.
- Reuse file folders and envelopes by placing a new label over the old one.
- Bring a reusable water bottle and/or mug to work instead of using disposables.
- Bring your lunch to work in a reusable container.
- Recycle any paper, plastic, glass, aluminum, or other recyclable materials you use.

Portfolio Manager is used by other national certification programs as well, including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), Green Globes system, the GreenFaith Energy Shield, and several Interfaith Power and Light faith affiliates. Dozens of city and state governments are also using Portfolio Manager for voluntary competitions and for mandatory GHG emissions tracking.

Benchmarking Steps

STEP 1 - GATHER DATA ABOUT YOUR PROPERTY

Before you can benchmark your property, you will need to gather information about your property and its energy and water consumption. ENERGY STAR has an online data collection worksheet that highlights the type of data you need to benchmark your property. A completed data collection worksheet will ensure you have all your information at hand when you set up your account. It is a good idea to nominate one member of your team to take the lead in setting up and managing the Portfolio Manager account (including data entry) to make sure there is a single point person for information management.

STEP 2 – SET UP YOUR PORTFOLIO MANAGER ACCOUNT

Appendix A: *Benchmarking your Property in Portfolio Manager* provides step-by-step instructions on how to create a Portfolio Manager account. Once you have established an account and entered the information from your data collection worksheet, you will be able to generate custom reports, charts, and data sets that will help your core team analyze your property's energy and water consumption. For more detailed information, utilize ENERGY STAR Training resources. ENERGY STAR has Express Videos which show users how to create a property, add meter data, share building data, and generate reports in five-minute animated demonstrations.

Ideally, you should update your energy and water use data every month to ensure progress reports remain current and relevant. Additionally, you can view your property performance results, including annual energy use, water use, environmental performance, financial performance, GHG emissions, and track your waste. You can also compare performance during two different time periods.

In addition to displaying your property's performance results online, Portfolio Manager can adapt the data from your portfolio into a ready-made report. These reports will be useful for presenting project results to the congregation, demonstrating the property's history of stewardship to potential lenders, or sharing your success with other interested parties.

STEP 3 - INTERPRET YOUR ENERGY STAR SCORE

Your initial ENERGY STAR score sets the benchmark by which your core team will be able to measure progress as you work to improve your efficiency. The ENERGY STAR score represents how your property's energy use compares to similar houses of worship on a scale of 1 – 100, with 1 being the least efficient and 100 being the most efficient. If your property has a score of 75 or above, it may be eligible to receive ENERGY STAR certification.

2.2 Conduct a Technical Walkthrough and Implement Sure Savers

Now that you have a better understanding of your energy and use, it's time to walk through your property. There are many reliable, low-risk actions that your team can take—*Sure Savers*—most of which are low- and no-cost. The Sure Saver categories included in this section include the following:

- Lighting
- Windows and Walls (Building Envelope)
- Office Equipment
- Kitchen and Food Service Equipment
- HVAC
- Water

You may be concerned that new, energy efficient technologies won't work as well as old ones, or that they will affect congregant satisfaction. There may be competing priorities, such as investing in costly high-profile improvements before low-cost/no-cost improvements. The appropriate sizing (and therefore the cost) of heating/air-conditioning or the payback on new windows, are all highly dependent on the baseline level of efficiency. Figure 2 below highlights the different energy use requirements at

houses of worship based on recent US Department of Energy data. As shown, energy for space heating is the largest use by far—highlighting the need for efficient HVAC systems and operations.

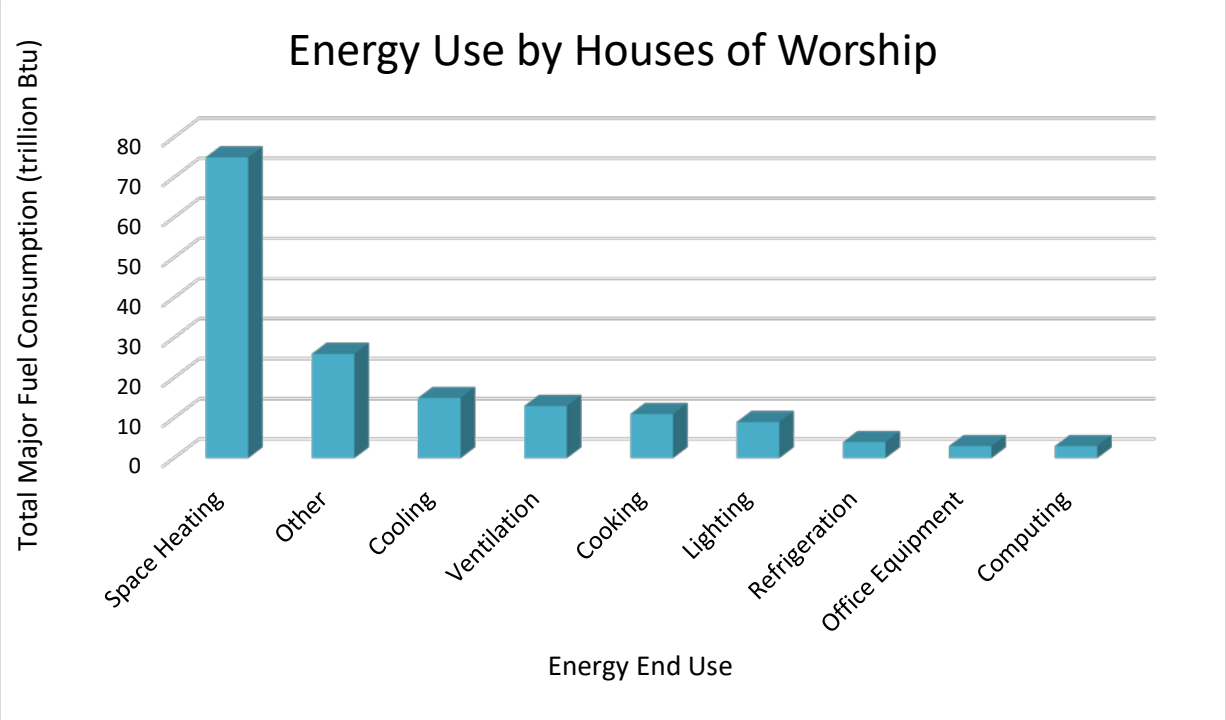


Figure 2. Illustration of energy end use as reported by Houses of Worship; based on Commercial Building Energy Consumption Survey (CBECS) 2012 data courtesy of Energy Information Agency, USDOE.

Before investigating professional assistance, implement some or all the following Sure Savers if they make sense for your property. Take the checklist that follows each component description with you and walk through your property to identify areas for improvement. Afterwards, your team can either "do it yourself" if there is the expertise on staff/among members, or you can hire a professional.

SURE SAVERS: LIGHTING

All congregations—regardless of size—rely on lighting (for large worship facilities of 250 seats or more, lighting is typically the most expensive Sure Saver). In today's market, new energy-efficient, long-life bulbs offer many features at affordable prices. This diversity provides multiple options for currently installed lighting equipment; replacement of outdated bulbs represents energy saving opportunities. You can achieve energy savings in your lighting system through two main pathways—installing more efficient equipment (bulbs and/or fixtures) and changing the way you operate lighting. *Appendix B.1: Lighting,* provides more information on each of the following guidelines suggestions:

- Replace incandescent bulbs with ENERGY STAR certified LEDs.
- Turn off lights (and other equipment) when not in use.
- Ensure that appropriate lighting levels are maintained. Too much light can be as bad as too little.

- Upgrade older T12 fluorescent bulbs with magnetic ballasts to more efficient T8 or T5 fluorescent bulbs with solid-state electronic ballasts.
- Ensure that LED retrofit kits are safe for use.
- Install LED exit signs.
- Install occupancy/vacancy sensors.
- Install daylight-responsive lighting controls.

Sure Savers: Windows and Walls (Building Envelope)

Your property's building "envelope" or "shell" includes windows, walls, a roof, and insulation. Addressing leaks that allow unwanted air infiltration into the building envelope can often eliminate a major energy drain. Outside air can enter a building through a variety of places, most commonly the windows, doors, walls, and roof. At the same time, cooled or heated air will be lost. Fresh outdoor air in the building is good, but only as controlled ventilation, not as accidental infiltration. Investigate the following options to improve your building envelope, then review *Appendix B.2: Building Envelope Assessment Guidance* for more information. If you find leaks that are easy to fix, utilize the ENERGY STAR resources on Sealing and Insulating.

St. Frances Cabrini Catholic Church in West Bend, Wis., is the first Catholic facility to earn the ENERGY STAR. Through funds from the church's operating budget and grants from WI Focus on Energy, the facility found the process of making itself more efficient fairly low-effort. In addition to changing lighting ballasts and bulbs, the church found that they saved a great deal of energy and water by changing water control valves in the kitchen and looking at how water was used for cleaning. Although the upgrades have made for a more efficient facility, most of the changes have had no visual impact for congregants.

- Check for leaks throughout the property.
- Check exterior walls for leaking and proper insulation.
- Check your roof and attic spaces to ensure the roof is in good condition and the attic is properly insulated; consider investing in a "green roof" or "cool roof".
- Check the condition of and replace windows and window shadings, if needed.
- Minimize unconditioned air flow through doors.

Sure Savers: Office Equipment

Office equipment used in worship facilities presents an often-overlooked opportunity for significant energy and cost savings. Surveys show a steady increase in the volume of electronic office equipment being used by congregations. The ENERGY STAR mark indicates the most efficient computers, printers, copiers, televisions, windows, thermostats, ceiling fans, and other appliances and equipment. Evaluating your office equipment can help your

congregation realize energy and monetary savings. More information can be found in *Appendix B.3: Office Equipment Guidance*.

- Always buy ENERGY STAR certified products for your congregation.
- Use power management features. Place computers (CPU, hard drive, etc.) into a low-power "sleep mode" after a designated period of inactivity.
- Replace cathode ray tube (CRT) monitors with ENERGY STAR certified monitors.
- Utilize smart power strips.
- Control amplifiers, receivers, and other audio equipment.
- Develop an education and/or training program to encourage energy conservation.
- Print double sided pages; much more energy is used in the manufacturing and distributing of paper than the actual printing at your office.

SURE SAVERS: KITCHEN AND FOOD SERVICE EQUIPMENT

Many worship facilities have kitchen areas where occupants can prepare coffee, lunch, snacks, or congregational dinners. Microwave ovens, coffee machines, stoves, and refrigerators are common in these areas. Microwave ovens and stoves generally consume energy in direct proportion to the need to prepare or warm foods, refrigerators run continuously, and coffee machines may be left on longer than necessary. There are also additional opportunities to improve energy efficiency if your building has a larger commercial kitchen. Review the following items to consider each suggestion as it may apply to your property. See *Appendix B.4*: *Kitchen and Food Service Equipment,* for more information on general food service equipment.

The Islamic Society of Boston Cultural Center (ISBCC) is the first mosque in the country to earn the ENERGY STAR certification. ISBCC is also a member of Massachusetts Interfaith Power and Light (MIP&L), a national organization that assists congregations with better environmental stewardship practices. ISBCC took advantage of MIP&L's offer of a comprehensive environmental assessment to their facility and combined that with their local utility company's energy-efficiency program offer to receive electrical and gas audits at no cost. The MIP&L and the utility assessments helped to identify areas of improvement and led to upgrading more than 70% of the lights in the building, adding motion sensors in bathrooms, and installing reducers on the faucets to save on water and energy.

- Purchase ENERGY STAR certified commercial food service equipment.
- Purchase ENERGY STAR certified kitchen appliances such as refrigerators, dishwashers, vending machines, and water coolers for your congregation.
- Check refrigerators for leaks and to see if a newer, more efficient model is available.
- Have walk-in refrigeration systems serviced at least annually.
- Use multiple refrigerators only when necessary.
- Turn off appliances (such as the coffee maker) when not in use.

SURE SAVERS: HVAC

The HVAC systems in a worship facility represent the largest portion of most congregations' utility bills. Worship facilities have unique needs compared to other buildings because of their energy-use patterns. Most commercial buildings require relatively constant heating and cooling, but worship facility energy use tends to be higher on weekends and lower during the rest of the week (with occasional spikes for special meetings and other functions). Because most congregations use most of their facilities only a few days a week, controlling your energy use to meet these needs will help the property reach optimal energy efficiency. In addition to the recommendations in this section, many of the improvements discussed in other sections of this appendix can improve the efficiency of your property's HVAC system. For example, efficient lighting has less waste heat and can reduce air conditioning costs; making sure the property is well insulated will allow the HVAC system to work less to maintain desired indoor temperatures. In addition to the points below, see the ENERGY STAR Guide to Energy-Efficient Heating and Cooling. Review the following items to consider each HVAC suggestion as it may apply to your property, then see *Appendix B.5: Heating, Ventilation, and Air Conditioning (HVAC)*, for more information.

When to Replace an HVAC System?

All equipment has a certain useful lifetime. This lifetime may be extended with regular maintenance, but at some point, the equipment will need to be replaced. Replacement can be an opportunity to invest in energy efficiency and can impact energy costs for years to come.

Because major HVAC equipment typically has a long useful life and a major impact on energy consumption, special attention should be paid to this equipment. Replacement of major HVAC equipment is expensive. When the equipment is 1-2 years from the end of its useful life, planning for a replacement should start so your congregation is not taken by surprise and ends up purchasing a less efficient but easily available model. Appendix B5 presents a full case study on running the equipment to failure versus replacing it before the end of its life.

- Keep windows and exterior doors closed while running the HVAC.
- Install a programmable thermostat to control the HVAC system.
- Check the accuracy of the thermostats.
- Change the filters monthly during "high use" seasons.
- Clean heating and cooling coils twice a year.
- Clear any clutter that is blocking vents or air intakes.
- Use fans when a room/area is occupied.
- Tune-up the HVAC system with an annual maintenance contract.

SURE SAVERS: WATER—HOT AND COLD

Energy and water efficiency are closely tied together. In most cases, electricity or natural gas is used to heat water, and this costs money. The more heated water your congregation consumes, the more you can save by optimizing water use. Additionally, treating and pumping water and wastewater may well be the number one use of electricity by your municipality. You can save water, energy, and money with the EPA's WaterSense program. The EPA created WaterSense to help American consumers and businesses use water more efficiently. Reducing water use lowers the costs associated with operating and maintaining equipment, as well as the energy needed to heat, treat, store, and deliver water throughout the property. WaterSense promotes water-efficient products and practices to help commercial and institutional facilities save water, energy, and operating costs. More information on the recommended actions below is available in *Appendix B.6: WaterSense and Water Guidance* and *Appendix G: EPA Guide: Saving the Rain: A Congregation's Guide to Stormwater Solutions*.

- Conduct a water assessment to identify major water uses within the property.
- Purchase WaterSense certified products when replacing fixtures such as faucets, showerheads, toilets, and urinals.
- Purchase an ENERGY STAR certified water heater when buying a new water heater.
- Insulate water heaters.
- Find and fix leaks.
- Set water temperatures only as hot as needed.
- Optimize the amount of water used in heating and cooling systems.
- Practice water-efficient landscaping.
- Construct sustainable stormwater management practices to absorb and treat stormwater close to where the rain falls, which reduces impacts to lakes, streams and estuaries. Read the EPA Saving the Rain: A Congregation's Guide to Stormwater Solutions.

2.3 Host a Treasure Hunt

In addition to walking through your property to identify Sure Savers, you may want to consider hosting an Energy Treasure Hunt at your congregation where teams walk around a building looking for quick ways to save energy which can add up to big savings. Hundreds of organizations have used Energy Treasure Hunts to reduce their facilities' energy use by 7 to 15 percent. Treasure Hunts focus on quick fixes with a short payback period. Many improvements can be made immediately and without significant expenditures or capital investments. These events can strike a positive, optimistic tone, focusing on outcomes and improving day-to-day operations—and can involve a large team to motivate and educate employees and volunteers. ENERGY STAR has created a Commercial Buildings Treasure

Hunt guide (with maps for specific property types) to walk you through the basics of planning and implementing a 1 – 2 day Treasure Hunt.

2.4 Consider an Energy Audit

After you and your team have gone through the Sure Savers, an audit can help identify additional specific areas for improvement. An audit is basically a survey of your property's energy and water use and is typically conducted by a professional. It includes specific energy and water consuming items, rates of consumption, and costs. If you are interested in both an energy and a water audit, you may need to conduct two separate audits, however some auditors may be able to do both. For more information on energy audits, including the types of audits available, how to decide when one may be needed, and information on managing the process, see *Appendix C: Energy Audits and Professional Assistance*.

There are different types of audits that can highlight energy use at your property in different levels of detail, from "walk through" to "investment grade". Depending on your congregation's expertise and the level of detail you would like to have done, your current staff or a member of your core energy stewardship team could perform an audit. In other cases, your congregation may need to hire a professional auditor. Usually professional audits make sense for larger properties with longer operating hours and more complex systems. For larger or more complex properties, an audit can identify ways to enhance the energy efficiency of current equipment, in addition to technically viable and cost-effective investment projects that will reduce property energy use and operating costs.

Ask your utility and your state energy office if they offer free or low-cost energy audits, financial incentives, or other technical support. See if there is an ENERGY STAR Service and Product Provider (SPP) in your area by visiting the ENERGY STAR SPP Directory. Certain faith-based nonprofit groups provide energy services for free or reasonable fees; ENERGY STAR has a listing of external faith-based stewardship organizations that may be able to help. A few to consider include GreenFaith and state affiliates of Interfaith Power and Light.

Some things to consider when looking at an audit include:

- Sometimes the full cost of a professional investment grade audit will be free if you agree to implement the auditor's recommendations.
- Another variation is called shared savings, in which there is no initial cost with the new equipment paid at a pre-agreed rate from monthly savings.
- If affordable professional services are not available, you can still achieve big savings with free ENERGY STAR tools, training, and technical support.

2.5 Review: Assess Performance

Step 2 gave you the tools and ideas you need to assess your property's energy and water performance. You learned how to benchmark your property's energy and water consumption using the ENERGY STAR Portfolio Manager tool and walk through your property to identify Sure Savers. You can use the review list below to measure your progress towards completing Step 2.

1. **Gather and track data:** Use Portfolio Manager to benchmark your congregation's energy and water consumption by entering a year's worth of utility data.
2. **Analyze your data:** Accurately assess your property's current energy and water use, track it over time, and compare your energy consumption to that of like properties with Portfolio Manager.
3. **Conduct a walk-through survey:** Walk through your property to identify and implement Sure Savers.
4. **Host an Energy Treasure Hunt:** Involve your team in finding more opportunities to save energy.
5. **Consider an audit:** Determine if a professional audit would be beneficial, and if so, choose the type of audit you'd like and find funding to cover its expense.

Step 3. Set Goals

By this point you've created an energy stewardship team, become more familiar with your property's energy consumption, benchmarked your property using Portfolio Manager, and identified Sure Savers. Now it's time to evaluate your priorities and set goals. Step 3 will help you identify the goals that are most important to your core team.

Step 3 will walk you through:

- How to identify the scope of your energy program goals.
- The steps of setting goals.
- How to prioritize goals.

3.1 Evaluate Priorities and Determine the Scope of Your Goals

Congregations decide to invest in energy efficiency for a variety of reasons. In some cases, different decision makers have different reasons for being interested in a project—some may be focused on the internal benefits, such as reducing the money spent on utilities, while others may be interested in external benefits, such as reducing the carbon footprint or other emissions harmful to human health. Often, investing in energy efficiency can maximize both internal and external benefits.

When setting project goals, it is important to start out by setting the scope of the project, especially to determine if it is organization-wide or specific to one aspect of the property. It is also helpful to review your benchmark energy use and evaluate past projects and best practices. Ideally, the goals for the project should link to any organization-wide strategic goals so they can align. You may want to review the goals of other congregations to see what worked best for their projects. What is most important is that the goals you set match your needs.

The Winchester Unitarian Society (WUS) in Winchester Mass. dealt with high heating costs each winter and used annual congregant donations to cover the heating bill. Instead of using the funds to cover the costs, the newly formed Building Committee challenged itself by setting specific goals to spend that money on energy-saving programs instead of energy use. In the first year, WUS used the $7,000 special appeal funds to implement heating upgrades and by the next winter had saved enough money from the heating bills to implement even more upgrades. The teamwork of the Building Committee and the congregants working together allowed them to make significant changes.

Some helpful methods to determine the savings potential associated with a goal may include:

- **Benchmarking.** Benchmark the energy use of your property to provide a yard stick for evaluating opportunity when enough data is available to show trends in energy use—this can be of use for both short-term and longer-term goals. Portfolio Manager includes sections specifically for planning and goal setting.

- **Evaluating past projects and best practices.** Evaluate past projects and best practices over time to see what works for your property and organizational culture.
- **Reviewing technical assessments and audits (if applicable).** Identify the opportunities to reduce energy use identified during walkthroughs and audits of your property to serve as a basis for potential improvement.
- **Comparing goals of similar worship facilities.** Review performance goals of other worship facilities. If you have colleagues who are undertaking similar work, see if they will share their goals and any lessons learned from their own projects. Your utility may be able to provide you with case studies as well.
- **Ask your peers.** Reach out to other congregations within your denomination or other local congregations to see if they have experience to share.

3.2 Set Goals

Once your energy team has set the scope of your goals and estimated the potential for improvement, you can put them into writing. Some examples of specific energy management goals include:

- **Defined energy (and/or water, GHG) reduction.** Goals are presented in terms of a specific quantity or percentage decrease in use, such as a 10 percent reduction measured in Portfolio Manager.
- **Cost reduction.** A savings of a certain percentage on utility bills. Note that this goal is easier to measure on an annual basis due to changing energy use over the course of the year. Portfolio Manager uses weather-normalized data which ensures accurate reports.
- **A more comfortable working/worship environment** such as lighting quality or temperature (measured through specific user feedback such as surveys of staff and congregants).
- **An increase in congregants participating in property issues**—such as bringing in the youth group or other types of volunteers.

3.3 Prioritize Your Goals

Once your team has set its goals, you will need to prioritize them. You should include other key decision makers at your congregation in this process to evaluate how well the proposed project aligns with the congregation's priorities, and how far it moves the team toward accomplishing its goals. Prioritizing your energy efficiency goals can also help your team look at what may be feasible to accomplish in a specific period—such as over the next year versus over the next five years.

Another important thing to consider when setting goals is cost. ENERGY STAR can help guide your financial decisions, calculate the cost of delay, and help you meet your performance goals through the Cash Flow Opportunity (CFO) Calculator. Additionally, you can use the ENERGY STAR Building Upgrade Value Calculator (BUVC) to analyze the financial value of efficiency-related capital investments. Finally, ENERGY STAR also has online savings calculators for ENERGY STAR certified products.

3.4 Review: Set Goals

Step 3 walked you through the process of setting goals for your project prior to creating an action plan. These goals will be overall markers for achievement—by doing a walk-through of your property and setting an action plan you can add more specifics to these goals. Measure your progress towards completing Step 3.

1. **Determine scope:** Your energy team can consider the scope of overall program goals you would like to set. It is important for your team to sit down with other decision makers and evaluate how well the goals align with your congregation's vision.
2. **Set goals:** Work within your congregation to determine which goals will best meet your needs.
3. **Prioritize project goals:** Rank which goals are most important for initial implementation compared to potentially longer-term goals.
4. **Think big:** Consider an "aspirational goal" such as being able to communicate a message to congregants a year from now: *Doing our part for environmental protection through 25% energy and water reductions and emissions savings.*

Step 4. Create an Action Plan

Once your team has assessed the current energy use of your property by benchmarking in Portfolio Manager, walked through the building and implemented Sure Savers, and has set goals for improved efficiency, it is time to create an action plan to help meet your goals. This plan should outline selected projects and activities ready for implementation. Be sure to update your action plan regularly to highlight achievements, changes to the property, and/or shifting priorities and goals.

Include the different sectors of your congregation when creating this plan to take all perspectives into account. This will help with leadership buy-in and most likely improve the implementation process if your energy team and congregants have played a role in plan development.

Step 4 defines the three key activities in creating an action plan:

- How to define projects.
- What to consider when you determine roles and resources.
- How to find funding for planned work.

4.1 Define Projects and Timelines for Implementation

Based on the work accomplished in Steps 1 – 3, you should have a clear picture of the energy and water use as well as the requirements of your property. You know which systems or appliances are in good condition and which may need replacement soon. Choosing projects and defining the steps to accomplish them will help you clarify a plan. First, look at reports from Portfolio Manager or any audits and see how your energy benchmark compares with the goals you have set for your property. Based on the gaps between your goals and your current situation, you can then identify what you need to do to meet your goals. This may be as easy as switching from incandescent light bulbs to LEDs, or a more complex project like replacing your heating system.

Once the steps for each project have been defined, you can now set timelines for project implementation. Creating concrete timelines (sometimes referred to as targets) allows you to have a clear idea of when accomplish a specific section of the action plan. The timelines should include milestones, so it is clear when certain projects need to be complete. Establishing a tracking system to monitor the progress of your projects helps you meet your targets.

4.2 Determine Roles and Responsibilities

For those teams at larger multi-building/multi-use worship facilities, you should ensure that everyone is clear on what aspects of the action plan they should focus on and at what level. Depending on the size and structure of your worship facility, your action plan may involve the Facility/Operations Manager, the Maintenance Department, IT, Purchasing, the religious leaders, and/or the Marketing/Communications Manager to ensure all sectors of your property and worship facility are covered. For example, the Maintenance Department can provide information on the physical structure and appliances, while the

Communications Manager can assist with a roll-out plan to inform your congregants and staff of your progress.

If you have a smaller worship facility, your action plan implementation team may be just you and one other volunteer, or you alone. It is important to identify which steps of the action plan you implement internally and for which you will need external help—such as contractors, consultants, utility representative, etc.

4.3 Assess Resources and Find Funds

After you and your energy stewardship team decide which energy projects to undertake, you will need to consider how best to fund those projects. This is a key component of any energy efficiency project. Knowing what funding is currently on hand, what could be raised quickly, and what could potentially be found elsewhere is important when deciding which projects are feasible and when to do them. It is a good practice to look at how funding availability fits into the congregation's overall property management plan.

If your team is focusing on smaller scale energy efficiency upgrades, you may be able to use funding from the congregation's general operations and maintenance budget, from funds already saved through efficiency, from small fundraising projects, or from a dedicated donation by a congregant. For projects that may require a larger investment, there are many traditional and nontraditional financial resources available.

Additionally, a well-designed upgrade may provide your property with a positive cash flow from energy savings and pay off the investment for new equipment. It is important for your team's financial representative to look closely at the best investments for your congregation over time. For more information on the different ways to finance upgrades, see Appendix D: *Project Financing*.

4.4 Review: Create an Action Plan

Step 4 included information about many possible upgrades and other activities that could be part of your team's energy efficiency action plan. This section gave you information to help you complete the tasks listed in the checklist below to create an action plan.

1. **Define technical steps and targets:** Based on your energy assessments, select projects to meet program goals and set targets for completion.
2. **Determine roles and responsibilities:** Once your targets are set, identify who is responsible for implementation for those projects.
3. **Determine if projects require funding and how best to secure it:** Cost-effective funding is key to a good return-on-investment. Savings from Sure Savers may fund some projects, while others may require more significant capital investment.

Step 5. Implement the Action Plan

Having a regularly updated plan in place to manage your projects and track their progress will help your energy stewardship team stay organized. In your tracking system, you should record not only the human, financial, and physical resources committed to projects that are currently being implemented, but also routine maintenance activities for existing infrastructure. Keeping track of what's happening with both new and existing infrastructure and equipment will ensure that your congregation gets the most value out of the resources they have invested in their worship facility.

The size and complexity of the energy efficiency projects your congregation undertakes will most likely be the main factor in deciding who will manage the project implementation. For something as simple as replacing HVAC filters or replacing incandescent lamps with LEDs, members of your team, facility staff, or congregants could complete the work. Depending on the skills available to your team, installing caulking and weather-stripping, ceiling fans, occupancy sensors for lights, LED exit signs, and programmable thermostats may be "do-it-yourself" projects not requiring outside help.

The St. Paul African Methodist Episcopal (AME) Church in Detroit, Mich., earned ENERGY STAR certification by conducting upgrades over the course of three months in the facility. Using staff expertise, the church facility manager updated the lighting with LEDs on timers, sealed ducts and holes in the building, and with a local contractor, updated the boiler with a timer and special controls. All the work was done through facility management funds and staff labor so there was no special fundraising was needed.

A more complex project, however, such as designing and replacing your property's entire lighting system, will require the help of someone who has experience managing that type of project, such as an energy services company (ESCO) or a private energy contractor. In these cases, your team should keep a record of the contractor's progress, and periodically review how their progress compares to the tentative schedule in the contract. This step will help communicate the plan to your congregation, effectively manage the efficiency upgrades, and keep the project on time and on budget. For more information on issuing a Request for Proposal, choosing a contractor, negotiating bids, and working with contractors, see *Appendix E*.

As you work to implement the action plan, communication and awareness is very important. Step 5 will explain:

- How to create a communications plan.
- Why you should raise awareness of your action plan.
- How to effectively manage projects and keep them on time and on budget.

5.1 Create a Communication Plan

Although your team may be all set to move forward with project management and implementation, it is important to create awareness, educate and motivate your congregation regarding energy efficiency and the benefits of the project. This will help them understand the goals of the project and give them notice of possible changes to the property. The communications plan does not need to be complex but should keep everyone in your congregation up to date on what the team has done, where the project currently stands, and what is still needed to be accomplished. It is helpful to provide timelines and other visual highlights of project milestones, planned deliverables, and progress. The Publicity/Outreach Coordinator from your stewardship team could be the contact person for questions about the project. The ENERGY STAR Communications Toolkit includes many resources that can help you create and implement a communication plan.

5.2 Raise Awareness of the Action Plan

The implementation of energy efficient practices and policies should involve individuals at all levels of your congregation. Effective programs make leadership, staff, congregants, and other key stakeholders aware of energy performance goals, the projects undertaken to reach those goals, as well as roles in project implementation.

Making people aware of how their everyday actions and activities at home, at worship, and at work affect energy use and impact the environment is a key step to implementing your action plan. Increasing overall awareness can be an effective way to gain greater support for your congregation's energy program and its goals. Additionally, staff members and volunteers at your congregation may have a limited understanding of energy performance and its impact on the organization and environment. Targeted efforts designed to increase awareness of program goals can help build support for each energy efficiency project. It is important to keep key stakeholders updated on progress by sharing Portfolio Manager reports as appropriate, providing general education on energy generation and use, and highlighting which equipment at your property uses the largest amount of energy.

By investing time in ENERGY STAR free training and educational content, and promoting energy efficiency, you can better implement your action plan to increase your overall organizational capacity. Many congregations find that engaged congregants and staff are more likely to contribute ideas, operate equipment properly, and follow procedures, helping to guarantee that capital investments in energy improvements will realize their potential.

5.3 Manage the Project - Implement the Energy Efficiency Upgrades

If members of the stewardship team or the congregation will be implementing the upgrades that are part of the project, your management of those tasks will consist of recording resources and deadlines, as opposed to micro-managing the project. Some projects may be grouped together to make them easier to accomplish, while others may be larger stand-alone work.

To best manage the project(s), make sure to keep track of:

- **Who** is responsible for implementing each project.
- **Where** (and in how many places) in your property the project upgrades be implemented.
- **What** your energy use benchmark was pre-project and how it has improved by using the ENERGY STAR Portfolio Manager tool.
- **What** financial resources are devoted to the project and how they are being spent.
- **When** the project upgrades will be completed.
- **How** to best motivate your staff to initially engage them and keep them involved throughout the project(s). This can be internal competitions, recognition, financial bonuses/prizes, or overall messaging on the financial and environmental benefits of this work.

Where you choose to store this information is up to you and your stewardship team; however, you should make sure that the project records are kept together to avoid fragmenting your knowledge of the progress made in your buildings' energy efficiency improvements. A permanent record of the project will be a valued artifact by, and of interest to, future congregants as part of the history of your house of worship.

As you continue to invest in efficiency projects, the maintenance required at your congregation's property will also continue. All equipment—even new energy efficient equipment—will need regular maintenance to perform at peak levels and to achieve optimal equipment life. Managing your property's maintenance is an important part of making sure that the project upgrades continue to benefit the property. Keep consolidated and well-organized records of the maintenance tasks for your property, the dates by which they must be performed, and verification that they were performed by those dates.

5.4 Review: Implement the Action Plan

In Step 5 you focused on implementing the action plan—both by performing energy efficiency upgrades and by communicating the work to your staff and congregation. You can use the checklist below to measure your progress towards completing Step 5.

1. **Create a communication plan:** Use freely available ENERGY STAR information, tools, calculators, and materials to enhance your ability to "do it yourself" using onsite time and talents, and to help the staff understand when professional assistance is necessary.
2. **Raise awareness of the action plan:** Educate your staff on energy efficiency measures and practices for your property.
3. **Manage your action plan:** Establish a consistent method for tracking the progress of your projects and maintenance tasks.
4. **If larger improvements are needed, select a contractor and negotiate a contract:** Select a contractor with whom your congregation will be able to cooperate, and negotiate a contract that cost-effectively implements your projects. This is the time to hire a contractor if it is deemed necessary, negotiate based on competing bids.

Step 6. Evaluate Progress

After you have implemented projects, it is important to evaluate their progress through a formal review of both energy and water use data as well as the activities carried out as they compare to your performance goals. Monitoring progress can help your stewardship team and the congregation look toward the future and create new action plans, evaluate the elements of your action plan that worked and what didn't work, and set new performance goals for future projects. Custom reporting features in Portfolio Manager can help monitor progress, evaluate current actions, and set performance goals.

Step 6 describes:

- How to track your progress.
- Why and how to measure the results of your work.
- When to review and modify your action plan.

6.1 Track Progress

It is good practice to continuously assess energy performance as your property implements energy efficiency projects. Continue updating Portfolio Manager each month to track how your property's energy and water consumption has changed over time, how much money the congregation has saved and, correspondingly, how much carbon has been saved. In addition, talk to your congregation about energy issues to see if they have noticed any changes in comfort, aesthetics, or usability experienced because of the project.

Green Castle Baptist Church in Louisville, Ky. has a very efficient facility—mainly due to their work in combining several technologies including high efficiency lighting, efficient windows, a tight building envelope, and a highly efficient HVAC system that is computer-controlled for different zones throughout the facility. The computer-controlled HVAC allows the facility manager to automate the heating and cooling of the facility for higher efficiency.

6.2 Measure and Verify Savings

As you design your project, it is good practice to incorporate a means to measure and verify the energy savings that result. Once the project is complete, your stewardship team can do the measurement and verification, which includes a formal review of energy use data and the activities carried out compared to the project's performance goals. These results will provide feedback on how everything is operating, the congregation's return on investment, and what new performance goals can be set. The results may also highlight areas where further investment is warranted. The data can then be communicated to the congregation to showcase the work done to date. Portfolio Manager is designed to make analysis accurate and reporting easy and effective.

How to Measure and Verify Savings

To measure how much energy your project has saved, you will need to have set a benchmark on how much energy your property was using pre-upgrade, which you did when you first entered your data into Portfolio Manager in Step 2. As described in that section, this tool provides calculations such as national weather data and emissions for the utility company serving your area and allows you to factor in changes in energy prices, your property's square footage, and its hours of operation.

Portfolio Manager can run different savings data based on the project information entered, such as the amount of energy and water saved, reduced carbon dioxide emissions, dollars saved, and others. Your team can also run a Statement of Energy Performance (SEP) report from the tool at any time. This report communicates information about your property's energy performance in a format that is both understandable and easy-to-highlight to your congregants. If your team chooses to apply for an ENERGY STAR label for your congregation (more information on this option is available in Step 7), the SEP, validated by a Professional Engineer or Registered Architect, can be used to verify project savings. ENERGY STAR hosts a growing list of Licensed Professional Volunteers who will provide free verification of worship facility data. However, your quickest and best verification resource may be the licensed professional members in your congregation or volunteers from the community.

6.3 Review the Action Plan

After reviewing your results and overall performance data, it is wise to then look at what factors affected these results and the effectiveness of your action plan. Which projects were most successful both in terms of ease of operations as well as saving energy? Which ones were poorly received by staff or congregants and/or did not result in measurable savings? Some helpful steps in reviewing your action plan may include:

- **Getting feedback** from the energy team, staff, and congregants.
- **Gauging awareness** to assess changes in employee understanding of energy issues.
- **Quantifying the side benefits** of your work including increased comfort and better public relations.

Taking the time to review the action plan and then taking steps to improve it can yield strong results for future initiatives at your property.

6.4 Review: Evaluate Progress

In Step 6 you reviewed the importance of progress evaluation through managing maintenance and tracking progress, as well as measuring and verifying savings. It is important to understand the outcome of your team's labor and to ensure that you are making the most of your congregation's investment. You can use the checklist below to measure your progress towards completing Step 6.

1. **Track progress:** Observe the benefits of your investments. Have discussions with your staff on how the improvements are affecting property comfort and usability in addition to the savings and emissions reductions.
2. **Measure and verify your savings:** Generate reports within Portfolio Manager and use the tool to assess the effect of the project on your property's energy and water consumption over time and to help you plan continuing improvement.
3. **Review your action plan:** Go through what worked and what didn't work so you can better plan your next project. Solicit feedback from staff and customers to get a fuller picture of the project.

Step 7. Recognize Achievements

After your energy stewardship team has completed Steps 1 – 6, you may feel like you're finished with the process of improving your building's energy efficiency. After your congregation has improved its energy use behavior, perhaps tweaked operations and maintenance practices, upgraded its building's equipment and technology where cost effective, reduced energy consumption, and realized financial savings, it may seem like all the work is done. And it's true—most of the hard work is done! All that is left to do is to receive appreciation and recognition for your team's efforts and encourage other facilities to practice energy stewardship with your story.

Providing and seeking recognition for your achievements sustains momentum and supports your energy program. Acknowledging the individuals who helped your congregation achieve results motivates staff and volunteers as well as brings positive exposure to the energy management program. You and everyone who is part of your success can congratulate each other publically through reciprocal promotion. Recognition from outside sources validates the importance of your work to both internal and external stakeholders, and provides positive exposure for the organization as a whole.

Step 7 provides guidance on:

- How to recognize achievements internally.
- How to solicit external recognition for your congregation.

7.1 Provide Internal Recognition

Seeing the results of your action plan including energy, water, and cost savings is usually what inspires most congregations and decision makers to develop an energy management strategy in the first place. Recognizing the accomplishments of the energy team as well as the staff and other volunteers in your organization sustains momentum for your efficiency program. Rewarding particular efforts defines what constitutes success and motivates your team. In order to provide recognition, first determine recognition levels, then establish recognition criteria, and determine recognition.

Determine Recognition Levels

The decision about who should receive recognition in your organization will likely be shaped by the purpose for providing recognition and your organizational culture. Common recognition levels

Lakewood Church in Houston, Texas, is the nation's largest regularly used worship facility seating 16,000. When the utility bills grew to nearly $1.5 million annually, the church decided to make some changes including creating an energy-efficiency program. "We are a non-profit church organization and our primary income is the donations and tithes of our members," says Lisa Ward, who oversees the energy-efficiency program. "Lakewood Church understands the great responsibility of demonstrating good stewardship of those financial contributions. The savings of more than $360,000 the church has realized in the first year of the program leaves no doubt that continuing the process is in the best interest of the church and the people it serves."

include:

- **Individual.** Acknowledge the contributions and accomplishments of specific people or everyone who contributed to your success.
- **Team.** Recognize the achievements of your energy team.
- **Department.** If your congregation is larger, you can reward the performance of a specific department.

Establish Recognition Criteria

Create criteria for recognition and communicate these criteria and any process eligibility requirements. Recognition criteria might include achievements such as: **1)** offered the best energy and/or water savings ideas; **2)** achieved the greatest energy/water use reduction; and **3)** increased savings by a certain amount.

Determine Recognition Type

There are a variety of ways to provide recognition and rewards. Forms of recognition can range from formal acknowledgements and certificates to simple forms of appreciation such as coffee mugs. You may consider:

- Asking the senior leadership to provide the recognition publicly during worship services.
- Using a formal means for providing recognition, such as an award ceremony.
- Highlighting services to the congregation through the newsletter and website. can do this in the congregation's newsletter, on its website.

7.2 Receive External Recognition

Good work deserves to be acknowledged. Recognition from a third party provides validation for your congregation's energy and water management program. Earning recognition for your congregation's successful energy use reduction is not necessarily about bragging rights or being unduly prideful in your achievement. Your congregation's stewardship success is a powerful tool to help other congregations learn about efficiency—and a powerful witness to the stewardship teachings of your faith tradition for other congregations across the faith community.

Additionally, the youth in your congregation may be observing your team's environmental stewardship actions for consistency with your congregation's teachings much more closely than you realize. These observations can constructively engage young members of the congregation in practical, hands-on expressions of their faith at home, at school, and in the community, as well as within your worship facility. You can communicate your success story through your newsletter, website, Facebook, YouTube, Twitter, and other social media. To develop a communications plan, review the ENERGY STAR Resource on Planning a Communications Strategy and/or the ENERGY STAR Communications Toolkit. The toolkit has many valuable resources to help your congregation share its work and results.

Consider that the commitment of your congregation and its leaders not only deserves fair notice, but that your congregation's example can multiply the stewardship benefits it has achieved by inspiring others to emulate your team's efforts through their own actions. Other congregations can learn from your experience in overcoming obstacles, financing improvements, when do-it-yourself is the best approach, when a professional is needed, how innovative solutions may have been created, and even facing problems your congregation has not yet solved. They may even share a possible solution with your congregation.

Other ways to gain recognition for your congregation's efforts as well as share your story can include:

Partnership Programs. If you have not already, join ENERGY STAR as a partner to pledge your commitment to energy efficiency.

Performance Standards. Meet widely recognized standards of performance, such as those established by ENERGY STAR, that reflect superior performance.

- **ENERGY STAR Certification for Existing Buildings.** Worship facilities are eligible to receive the ENERGY STAR when the Portfolio Manager tool scores the energy use of the building at 75 or higher on EPA's 1 – 100 ENERGY STAR scale. This score is based on such inputs as 12 months of energy utility billing data, property square footage, and critical equipment and operating characteristics. A score exceeding 75 indicates energy performance in the upper quartile of U.S. worship facility energy efficiency. The integrity of the score is assured by the requirement that all data be verified by a licensed Professional Engineer or a Registered Architect. To assist worship facilities in earning certification, search the database of licensed professionals offering data verification free of charge. A property can reapply for the ENERGY STAR each year. You can also see which congregations have earned the ENERGY STAR—some have earned it eight times!
- **Designed to Earn the ENERGY STAR for New Construction.** Many congregations can do-it-right the first time by insisting on new building design and construction that address the costs and benefits of energy efficiency from the start. The incremental cost of optimal energy efficient design, materials, and systems for new construction is much smaller than having to retrofit poor design and cheaper first cost equipment that costs more to operate in the long run. EPA works closely with the American Institute of Architects, and with its participation created online tools to help architects design for optimal energy performance and long-term cost savings.

Awards, Challenges, and Competitions. Participate in ENERGY STAR Competitions and Challenges to see how much energy and water your property can save—with opportunities to earn recognition from ENERGY STAR for your successes.

- **ENERGY STAR National Building Competition.** Energy managers in buildings in every state compete to see who can save the most energy and water. Competitors will work off the waste through improvements in energy and water efficiency and can receive recognition for achieving specific reductions. Congregations can also set up congregation-specific competitions.
- **ENERGY STAR Guide to Energy Efficiency Competitions.** If your congregation is interested in setting up or participating in a competition, see the ENERGY STAR Guide to Energy Efficiency Competitions which can take you step-by-step through the process. Other congregations may not have connected the ideas of energy conservation and stewardship, or they may not know where to start on energy efficiency projects of their own. You can help these congregations become better stewards by inspiring and challenging them to improve their buildings' energy efficiency.

Other Energy Stewardship Programs

A large and growing number of denominational, interfaith, state, and local organizations offer programs supporting and recognizing the greening and environmental stewardship success of congregations of all sizes. ENERGY STAR tracks these programs on the ENERGY STAR Congregations webpage.

Through ENERGY STAR, EPA focuses on improving energy performance in buildings as a method of reducing GHG emissions. An additional certification program is Leadership in Energy and Environmental Design (LEED), which includes various aspects of green building and awards recognition to buildings that meet certain standards.

The EPA believes that energy efficiency is the first step to going green, and that no building can be truly sustainable if not highly energy efficient. Further, energy efficiency savings can also be used to pay for other green features. Using ENERGY STAR tools and resources and recognition, where available, will ensure that your congregation's green buildings are truly energy efficient and can remain so. State affiliates of Interfaith Power and Light (IPL) such as Michigan IPL, Pennsylvania IPL, and Georgia IPL are working with local groups to highlight more opportunities for energy efficiency in their areas. Additionally, some denominational groups can provide support to congregations by connecting to technical expertise and guidance as well as financing for energy efficiency upgrades. Examples of these groups include Lutheran's Restoring Creation and the Evangelical Lutheran Church of America, United Church of Christ, Conference for Catholic Facility Management, and Catholic Energies.

7.3 Review: Recognize Achievements

In this final step, you looked at different ways to share your congregation's story and recognize its achievements through possibly applying for ENERGY STAR certification, participating in energy savings challenges and competitions, and through other programs. It is important to highlight the hard work of your energy stewardship team to your congregants and to other congregations to keep the momentum moving forward. You can use the checklist below to measure your progress towards completing Step 7.

1. **Provide internal recognition:** Publicly recognize those who made the energy program succeed. These may include staff, volunteers, and donors.
2. **Tell your story:** Share your team's results with other congregations through traditional and social media, such as local newspapers, community "bulletin board" websites, Twitter, and Facebook.
3. **Plan an energy efficiency competition in your workplace:** Enter a competition that supports a good cause and inspires excellence. Check out the ENERGY STAR Guide to Energy Efficiency Competitions Guide. All buildings can participate in EPA's National Building Competition.
4. **Apply for ENERGY STAR certification:** More than 90% of American households recognize the ENERGY STAR. Your community will appreciate your congregation's contribution to environmental protection.

Now that you're familiar with the ENERGY STAR Action Workbook, we invite you to explore or download the Workbook Appendices from the ENERGY STAR Congregations webpage and review the information for office equipment, lighting, heating/cooling, and other building systems. You will find additional guidance on getting started with Portfolio Manager, energy audits, working with contractors, project financing, and additional online resources. Don't forget—you can find frequently asked questions or email your own questions anytime to ENERGY STAR tech support. Good luck and tell us about your success!

APPENDIX A – Benchmarking your Property with Portfolio Manager®

Entering your property's energy and water use data into the free online Portfolio Manager software will allow your team to track and measure the property's energy and water use over time—this is especially helpful as new upgrades are implemented. You will need both property data and utility data to benchmark your building in the program.

Before you set up an account, it can be helpful to review what data is needed. The ENERGY STAR data collection worksheet will highlight what specific data is needed for your property type after you select the property type from a dropdown menu. Note, congregations are listed as "worship facility" in Portfolio Manager. Some specific information that will be required for all property types include:

- Portfolio Manager username and password.
- The building street address, year built, and contact information.
- The building gross floor area and key operating characteristics for each major space type. Use this worksheet to collect this information before logging in to Portfolio Manager.
- 12 consecutive months of utility bills for all fuel types used in the building and water if you will also track water. If you don't have this information readily available, contact your utility provider(s) as most will be able to easily supply this historical information.

Once you have collected your property's data, you're ready to create the Portfolio Manager account. ENERGY STAR has a Quick Start Guide to walk you through setting up an account, and inputting the data you collected from the data collection worksheet. If you have questions or trouble during the process, the Portfolio Manager Help Desk is a valuable resource to guide you through the process. For more detailed information, utilize ENERGY STAR Training resources. ENERGY STAR has Express Videos which show users how to create a property, add meter data, share building data, and generate reports in five-minute animated demonstrations.

Once you have your account set up and data inputted, you can start to look at trends in energy and water use and see your congregation's performance results per selected metrics. In addition to displaying your results, Portfolio Manager can adapt the data from your account into ready-made reports. You can generate reports instantly using your property data, or you can request a Statement of Energy Performance (SEP). Guides are available to help you understand how to produce either Standard Reports or Custom Reports.

Appendix B – Sure Savers: Energy and Water

When looking at which products and appliances to purchase, which projects to undertake, and which behavioral changes to implement, the amount of information can be overwhelming. This appendix walks through six project sectors to help your team decide which actions are most beneficial to implement as part of your energy efficiency projects. In your decision-making process, consider both the initial cost of installing the efficient technology/product/practice and its expected energy cost savings compared to the technology/product/practice currently in use. The sections included in this appendix are:

- Lighting
- Windows and Walls (Building Envelope)
- Office Equipment
- Kitchen and Food Service Equipment
- Heating, Ventilation, and Air Conditioning (HVAC)
- Water

In addition to this information, there are free online resources for more product-specific information:

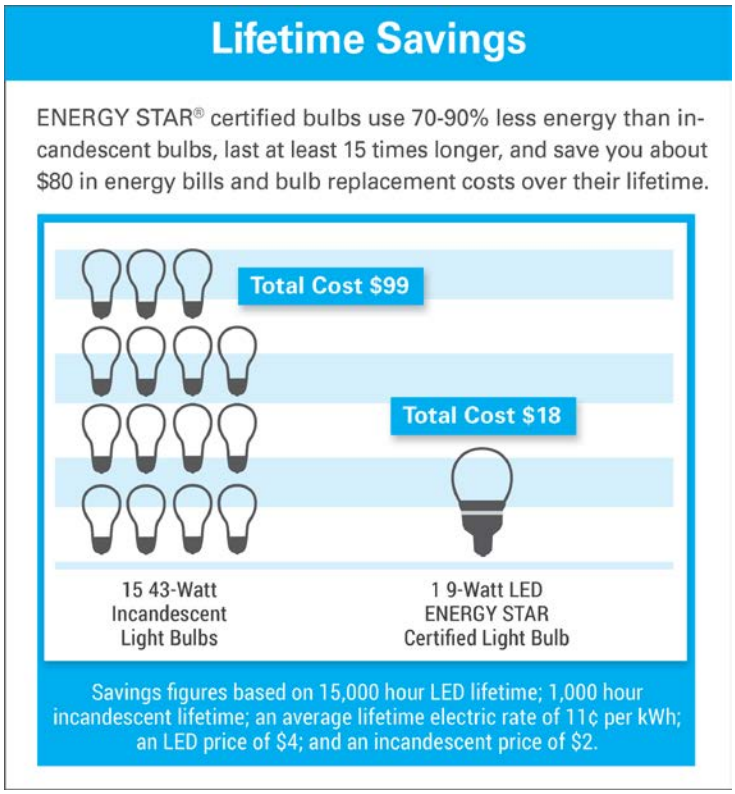
- ENERGY STAR Products website
  - ✓ Learn more about the ENERGY STAR label.
  - ✓ Find ENERGY STAR labeled product lists, cost calculators, and other analysis tools on office and commercial food service products.
- Federal Energy Management Program (FEMP) Energy Efficient Products website
  - ✓ FEMP offers its own recommendations for products not listed under ENERGY STAR.
  - ✓ Detailed information about performance requirements for energy-efficient products, energy cost calculators, and additional resources and analysis tools.
  - ✓ Energy Savings Calculators for appliances.

B.1 LIGHTING

The lighting systems in a worship facility are integral to a safe, functional, and comfortable environment. Traditionally most, if not all, of these lighting needs were met with incandescent or halogen bulbs because of their low initial cost, warm color, and dimming capabilities. However, both types of bulbs are inefficient and radiate significant waste heat. Today, new energy-efficient, long-life bulbs provide features similar to incandescent and halogen bulbs at affordable prices. The result is a tremendous diversity in lighting products—all with varying efficiencies that could represent energy saving opportunities. This section discusses the two basic ways to achieve energy savings in your lighting system—installing more efficient equipment, and/or changing the way you operate the lighting. This means turning lights off when unneeded, maintaining the lighting systems (keeping them clean), and illuminating spaces only to the light levels required to suit the task. For large worship facilities of 250 seats or more, lighting is typically the most expensive Sure Saver.

Use the following information to consider each lighting suggestion as it may apply to your property.

- **Replace incandescent bulbs with ENERGY STAR certified LEDs.** Light Emitting Diode bulbs (LEDs) can be used for your recessed lighting, pendant fixtures, and accent and spot lighting applications. LEDs cost about 75 percent less to operate than incandescent bulbs, and last about six times longer; generating about 75 percent less heat. Until recently, LEDs were more expensive to purchase up front than CFLs; this is no longer the case and LEDs use less energy over the lifetime of the bulb and last longer. New ENERGY STAR specifications set efficiency levels above today's CFLs, and major manufacturers are not investing in CFL technology improvements. Additional benefits to LEDs include superior dimming ability over CFLs, better color rendering, and they contain no mercury. ENERGY STAR certified LED bulbs are available in a variety of shapes and sizes for any



application—including recessed cans, track lighting, table lamps, and more. If you see an incandescent bulb, there is a cost-effective replacement option available. Look for lights that are ON most often and are easily accessible.

The ENERGY STAR Lighting Calculator allows you to look at how quickly more efficient bulbs can pay off based on your utility rate, the type of bulb you are replacing, and the replacement type. This can provide a quick estimate on the savings potential of more efficient bulbs.

The ENERGY STAR website has many resources on ENERGY STAR certified lighting and the energy savings opportunities by using LEDs.

If you have a larger worship facility with more lighting, you should review the US Department of Energy Better Buildings Interior Lighting Campaign (ILC) materials. The ILC is a recognition and guidance program designed to help facility owners and managers take advantage of savings opportunities from high efficiency interior lighting solutions.

The Lighting Research Center at Rensselaer Polytechnic Institute is a center for lighting research and education—pioneering research in solid-state lighting, light and health, transportation lighting, and energy efficiency.

- **Turn off lights (and other equipment) when not in use.** High utility costs often include paying for energy that is completely wasted by equipment left ON for long periods while not in use. You may wish to visit the property at a time when everything is supposed to be turned off and make a list of places where the lights were left ON. Also, ensure that exterior lighting—typically not needed during the day—is turned off in daylight hours. Different types of automatic controls can turn lights ON when needed and off when not.
- **Ensure that appropriate lighting levels are maintained.** Too much light causes glare—and it costs more. Fine-tuning the bulb wattage, type, or layout can improve visual quality and reduce energy use. You may want to consider conducting a lighting assessment by walking through your property both during the day and at night to determine if you are over/under lighting certain areas. A good light meter is relatively inexpensive and can provide accurate lighting levels. You can use the light meter to record horizontal illuminance levels (fc) in various spaces within your property and then compare your results to the suggested illuminance levels for houses of worship listed below. When measuring illuminance levels, be sure to:

  - Turn on all the electric lights, even for the daytime measurements.
  - Hold the illuminance meter steady, and make sure the sensor is horizontal and at the correct height for the space types listed in the worksheet.
  - Wear dark clothing to minimize the effect of reflected light from your clothes on the sensor.
  - In general, light level measurements should be taken at 30” above any finished floor. This is appropriate for offices, classrooms, pulpit, choir, and nave.
  - Take hallway, lobby, and other general circulation space measurements at the floor level.
  - Take restroom measurements at counter height.

- Take several readings throughout each space, noting the minimum, maximum, and average light levels for each space.
- Record nighttime and daytime light levels within each space. Take these measurements at the same location to determine daylight contribution, and note sky conditions (clear, partly cloudy, cloudy, etc.).

Recommended Illuminance Levels (fc) (*Recommended Illuminance levels from the Illuminating Engineering Society of North America (IESNA) Lighting Handbook, Tenth Edition)*

- Lobby: 10
- Worship Pulpit, Choir, Sacristy: 20 – 100
- Private Office: 30
- Classroom: 30
- Kitchen: 50
- Congregation Seating: 5 – 30
- Corridor, Stair: 5
- Restroom: 10
- Storage: 5
- Electrical/Mechanical: 20
- Parking Areas (uncovered): .2

Once you have this information, you can determine which areas may need more (or less) lighting. Then, you can investigate the efficiency of your current lighting.

- **Upgrade older T12 fluorescent bulbs with magnetic ballasts to more efficient T8 or T5 fluorescent bulbs with solid-state electronic ballasts.** Because T12 bulbs are no longer manufactured, it is timely to upgrade to more efficient T5 or T8 bulbs**.** T5 (less than 1" diameter) and T8 (1" diameter) fluorescent bulbs with modern electronic ballasts use less energy than older T12 (1.5" diameter) fluorescent bulbs while providing the same amount of light. In areas of the property where T12s are used for many hours per week, a T12 to T8 or T5 upgrade can pay back the costs quickly, but will require both bulb and ballast changes.
- **Ensure that LED retrofit kits are safe for use.** Underwriters Laboratories (UL), a global safety and science organization, advises that any LED retrofit kits (commonly used to replace recessed ceiling lighting) that are chosen for a project are UL-approved and that proper installation and permitting (if necessary) takes place to ensure they are safe for use.
- **Install LED exit signs.** You may want to consider an LED-illuminated exit sign, which saves about 90 percent over an incandescent fixture's lighting electricity costs. When deciding whether to replace your incandescent exit signs with LEDs, remember that LEDs last for 25,000 hours, whereas incandescent lamps last for only 750 to 2,000 hours. This decreases the need change bulbs as frequently; the

lower risk of bulbs burning out can increase property safety. There is an initial up-front cost increase for LEDs, but once installed and running continuously, they last almost three years before requiring replacement.

- **Install occupancy/vacancy sensors.** Install wall-mounted occupancy or vacancy sensors in high-use areas to automatically turn lighting off when no one is present. If occupants forget to turn the lights off when they leave the space, occupancy sensors turn the lights off after a pre-set time, and turn them back on when people re-enter the room. Vacancy sensors automatically turn lights off, but the user must manually turn them back on. Vacancy sensors generally create greater energy savings than occupancy sensors because there are times when occupancy sensors will turn the lights on even when the occupant doesn't necessarily need the lights on. This is particularly true in any space with windows. Investing in dual-technology occupancy/vacancy sensors is an excellent way to save money and energy. These room sensors combine passive infrared and ultrasonic technologies to detect occupants in different ways. Having two technologies that must agree on occupancy helps eliminate false positives—where lights turn off when occupants are sitting still or lights turn on when no one is in the space but papers flutter, etc. When installing the sensors, remember that even good equipment can be installed in an incorrect location; they should not be installed behind a coat rack, door, bookcase, etc. Likewise, they should be located so that neighboring traffic doesn't inadvertently cause a false trigger. Sensor vendors generally provide a diagram indicating the sensors' "cones of sensitivity" to assist with proper positioning.
- **Install daylight-responsive lighting controls.** Daylight-responsive lighting controls typically consist of dimmable or switchable ballasts and drivers (installed in the fixtures) and a photocell (typically mounted on the ceiling). These components work together to turn lights on and off (or dim) automatically based on available daylight, thus producing energy savings while maintaining the proper illumination levels for the space. The performance of daylight controls depends on customizing the lighting requirements of each individual space. The sensor's installed position should also be carefully considered to ensure that it is accurately tracking task light levels.

B.2 WINDOWS AND WALLS (BUILDING ENVELOPE)

Your property's building "envelope" or "shell" includes windows, walls, a roof, and insulation. Addressing leaks that allow unwanted air infiltration into the building envelope can often eliminate a major energy drain. Outside air can enter your congregation through a variety of places, most commonly the windows, doors, walls, and roof. Outside air can be refreshing, but only as controlled ventilation, not as accidental infiltration. Improvements to the envelope will vary based on several factors, including how the property was built, when it was built, and how it is maintained. The following suggestions provide detailed information on how to check specific areas, address small leaks, and if necessary, suggest greater improvements to the envelope. These include checking: 1) leaks in the overall property; 2) exterior walls; 3) roof and attic spaces; 4) windows and shading; and 5) doors. ENERGY STAR has sealing and insulating resources that you can use to fix leaks as you walk through the property—this includes installing weather stripping, insulating ducts, sealing leaks around windows and doors, adding insulation, and installing plastic on windows. The resources can also help you determine which projects you can do yourself and which may need external expert resources.

B.2.1 Check for Leaks in the Overall Property

Follow the steps below to identify and fix weak points in your property's overall building envelope. You will also get to know the structure and elements of the building better in the process. You may find it helpful to have the items listed below on hand when completing the building envelope assessments for your property. To complete the task, you should have the following materials on hand: tape measure/ruler; incense stick and lighter; flashlight; digital camera; ladder; and thermometer. Then follow the steps below to identify and fix problems in the property's overall building envelope.

1. **Collect architectural and construction drawings of the building**. Use these resources to determine the layout of internal zones and the construction of exterior surfaces.
2. **Look for noticeable air infiltration in the property and record your observations**. Record temperatures from different points throughout the building to identify less noticeable infiltration points.
3. **Run either a smoke pencil or a lit incense stick slowly along door jams, window frames, and vents to determine the level of air flow**. This flow is "air infiltration" or the exchange of unconditioned outside air that your congregation paid to heat or cool. Record locations where there are drafts or a lot of air movement in your building sketch. You may need to turn on the air handlers (fans/ventilation) to create air pressure.
4. **Check the interior walls**, being sure to record the wall construction and if there is any insulation/wall condition and noticeable air infiltration.

5. **Take a digital photo of all areas of concern**.

B.2.2 Check Exterior Walls

Follow the steps below to check for problems with the property's exterior walls.

1. **Check for and fix air leaks**: Unconditioned outside air can add additional heating or cooling requirements. Seal areas of infiltration in walls using caulk or weather stripping to prevent unconditioned air from entering your property.
2. **Check for and fix rainwater leaks:** Wet insulation is not as effective as dry insulation, and excess moisture can create mold, rot, and structural decay. Mold can be a serious health hazard for staff and customers. Fix rain leaks in exterior walls by repairing poorly installed siding, flashing, weather stripping, or caulking.
3. **Check the insulation**: Installing additional insulation in exterior walls is a possible way to reduce heat gain or loss. However, depending on the construction of the building, this could be very labor intensive and expensive:
    a. Use loose-fill insulation for enclosed existing walls and hard to reach places.
    b. Use rigid fibrous insulation for ducts in unconditioned spaces and other places that can withstand high temperatures.
    c. Use spray foam or foamed-in-place insulation for enclosed existing walls.
    d. Make sure to use ENERGY STAR certified insulation for optimal efficiency results.

B.2.3 Check Roof and Attic Spaces

Follow the steps below to check for problems with the property's roof and attic spaces.

1. **Check the roof for the following and record:**
    a. Any water intrusion.
    b. Roof age and warranty.
2. **Assess the roof condition** (including signs of leaks, membrane holes, and damaged insulation):
    a. Roof construction and insulation thickness.
    b. Check attic bypasses.
3. **Check the insulation**: You may want to use a professional to determine the best insulation solution if you need to add more/replace existing insulation. They may recommend that after first sealing attic air infiltration, increase attic and roof insulation to reduce heat transfer; unconditioned outside air can add additional heating or cooling requirements.
    a. In an unfinished attic, use loose-fill, sprayed foam, or foamed-in-place insulation.
    b. In unfinished attic walls and ceilings, use batt or roll insulation.
    c. Make sure to use ENERGY STAR certified insulation for optimal efficiency results.
4. **Check to see if the roof surface needs replacement**: Research and consider the possibility of retrofitting the existing roof with a "green" roof or a "cool" roof to reduce heat transfer; the Department of Energy has a Cool Roof Calculator to help you make this assessment. Additionally, you can review the Global Cool Cities Alliance's Cool Roof Toolkit for more options. Make sure to have a structural engineer evaluate the building if the new roof is going to add weight to be sure that your building is strong enough to carry the additional weight.

B.2.4 Check Windows and Shading

Follow the steps below to check for and fix problems with the property's windows and shading.

1. **Fix leaks:** Seal areas of air infiltration, starting with the attic and moving to windows using caulk or weather stripping to prevent unconditioned air from entering the building.
2. **Check the windows**, especially if you are considering replacements, being sure to record:
    a. Window condition (cracked or broken glass, dry rot, missing caulk, etc., both inside and outside).
    b. The window to wall ratio on each façade (the area of the window: the area of wall).
    c. Window size and dimensions.
    d. Window framing and type of thermal break.
    e. Window type (double paned, single paned, etc.).
    f. Window operation.
    g. External window shades/overhangs/caulking.
    h. Interior window blinds.
3. **Consider installing new ENERGY STAR certified windows/skylights**: New windows are expensive and may not provide the savings relative to cost of many other upgrades. However, when the property needs new windows, replace old or single-pane windows with ENERGY STAR certified double- or triple-pane glass and an insulating gas. Consider choosing windows with tints, heat reflective coatings, or laminates to further reduce heat gain. Old and metal window frames should also be replaced with non-metal insulating frames.
4. **Check interior shading**: Venetian blinds and other operable shades are low-cost and effective solutions for keeping out sunlight in summer months.
5. **Check exterior shading**: Overhangs, awnings, shade screens, roller blinds, and vegetation can provide exterior shading that also reduces the glare from direct sunlight striking glass windows. Overhangs and awnings can be particularly beneficial because they admit light from the low winter sun (when sunlight is beneficial for heating and lighting) and tend to block the higher summer sun (when solar gain is less desirable). Western sun in the summer, especially in hot climates, can increase the cooling requirement of your HVAC system substantially, so it is a good idea to focus shading to the western windows first (in warm climates).
6. **Consider installing fiberglass or metal shade screens**: These cost-effective applications can reduce solar heat gain up to 80 percent compared to un-shaded clear glass. A shade screen is a specially fabricated screen of sheet material with narrow weave or louvers formed in place to prevent solar radiation from striking a window. The air space between the exterior shade screen and the window helps carry away heat absorbed by the shade before it can be transferred through the window.
7. **Consider exterior roller blinds**: These are a series of slats, typically horizontally oriented, made of wood, steel, aluminum, or vinyl. Like interior shades, they can be raised or lowered as needed to control the amount of sunlight entering a building space. In warm temperatures during sunny hours, they can be lowered to function as an insulating barrier to limit incoming sunlight and reduce heat gain. In cold weather they can be raised to allow desirable heat gain. Partially rotating the blinds allows some daylight and air to enter between the slats.

8. **Plant a tree**: Deciduous trees are very effective at providing shade. During the winter when they are bare, they allow sunlight to pass through; in summer they leaf out and provide shade. The best location for deciduous trees is due west of west-facing windows. East, southeast, and southwest sides of buildings are also good locations. Plant trees within 20 feet of windows and allow them to grow at least 10 feet higher than the window.

B.2.5 Check Doors

Follow the steps below to check for and fix problems with the property's doors. If you need to replace doors, research a replacement door that is ENERGY STAR certified.

1. **Check for and fix air leaks**: Seal areas of air infiltration around attic access and doors using caulk, weather stripping, and door sweeps to prevent unconditioned air from entering the property.
2. **Calibrate automatic doors**: If your property has doors that open automatically, set the sensitivity so that the doors only open when people are approaching the doors. This is especially important if there is a commonly traveled pathway close to the door.
3. **Install revolving doors**: One technical option is installing a revolving door to reduce the exchange of unconditioned and conditioned air. However, this could be an expensive option.
4. **Create an entrance vestibule**: A vestibule is two sets of doors separated by a small enclosed space. The idea of a vestibule is that only one set of doors is open at a time. This reduces the amount of unconditioned air entering your property.

B.3 OFFICE EQUIPMENT GUIDANCE

Office equipment used in worship facilities presents an often-overlooked opportunity for significant energy and cost savings. Surveys show a steady increase in the volume of electronic office equipment being used by congregations. This includes computers, printers, copiers, televisions, and small appliances such as coffee makers. Evaluating your office equipment use will help your congregation realize energy and monetary savings. Review the following information to consider each suggestion as it may apply to your property:

- **Always buy ENERGY STAR certified products when new office equipment is needed.** The ENERGY STAR label indicates highly efficient computers, printers, copiers, televisions and other small appliances and equipment. Equipment that has earned the ENERGY STAR saves energy and money. Many of these products save energy by utilizing auto-power down settings which cause the unit to enter a sleep or off-mode when not used after a certain amount of time. In addition, they also consume less energy when in use. The easiest way to measure potential cost savings from investing in ENERGY STAR certified office equipment is to use one of the free online ENERGY STAR calculators for office equipment.
- **Set computer power settings to save energy when not in use.** An average desktop computer consumes 58 watts when powered on and three watts when in a sleep state. Over 60 percent of computers in the United States (U.S.) are left powered on overnight. This can waste significant amounts of money and energy while generating excess heat on site and unnecessary carbon emissions at the power plant. Because the use patterns for many typical businesses are standard, you can program the computers to follow a typical schedule. ENERGY STAR has instructions for setting computer power settings for different operating systems as well as online calculators to help estimate how much you can save using power management.
- **Replace cathode ray tube (CRT) computer monitors.** Older CRT monitors should be replaced by ENERGY STAR certified monitors to take advantage of the energy savings. It is important to dispose of CRT monitors properly through recycling because they may contain hazardous or toxic components. The average CRT monitor operates at 73 watts while a more efficient monitor uses 28 watts.
- **Utilize Smart Power Strips.** Smart power strips address a key energy-wasting issue: the fact that many appliances and other equipment pull a slight energy load, even when turned off (also called the “vampire effect”). Many devices can be plugged into the same power strip, which can then be turned off to ensure that the appliances are not drawing any power. can be used for office and

kitchen equipment that “stays on” even when turned off, such as a television, coffee maker, or stereo system. Smart power strips are available from most electronics retailers, but it's also a good idea to check with your local utility. Many electric utilities offer smart power strips at a discount or rebate a portion of the retail price.

- **Control amplifiers, receivers, and other audio equipment.** Congregations often use audio equipment throughout their services. Amplifiers use an average of 34 watts when turned on but are not playing, and can use from 250 watts while in use for a smaller facility, up to 1,500 watts while in use for a medium-size facility. Because there is no predictable use pattern for a property, the best power-saving strategy is to manually turn them on/off and educate users about energy-efficient operation.

  Receivers use about 35-50 watts when turned on but not playing, and three watts when in standby mode. It is generally good practice not to unplug or remove all power from receivers for extended periods of time because many receivers can lose their stored settings after a few days. The optimal power management strategy is to educate the users of this equipment to switch the device to standby when not in use.
- **Develop an education and/or training program to encourage energy conservation.** Educated staff and congregants can make significant contributions to load reduction by simply turning off office equipment when it is not in use, and enabling energy-saving settings for computers and monitors. ENERGY STAR has free training and educational resources available online, including pre-recorded trainings that users can access any time of day.
- **Print double sided pages**. Much more energy is used in the manufacturing and distributing of paper than the actual printing at your congregation; this will also save on paper use and waste at your congregation.

B.4 Kitchen and Food Service Equipment

Many worship facilities have kitchen areas where occupants can prepare coffee, lunch, snacks, or congregational dinners. Microwave ovens, coffee machines, stoves, and refrigerators are common in these areas. Microwave ovens and stoves generally consume energy in direct proportion to the need to prepare or warm foods, refrigerators run continuously, and coffee machines may be left on longer than necessary. There are also additional opportunities to improve energy efficiency if your building has a larger commercial kitchen. Review the following items to consider each suggestion as it may apply to your property.

- **Purchase ENERGY STAR certified commercial food service equipment.** Certified refrigerators and freezers are, on average, 30 percent more energy efficient than standard models. There are also ENERGY STAR certified commercial dishwashers, fryers, griddles, hot food holding cabinets, ice machines, ovens/stoves, water coolers, and steam cookers.
- **Purchase ENERGY STAR certified kitchen appliances** such as refrigerators, dishwashers, and water coolers for your office to save energy at the office kitchen. For example, a typical bottled water cooler can use more energy than a large residential refrigerator. An ENERGY STAR model requires about half as much energy as a standard unit, which reduces your utility bills.

  Improving your property's refrigerated vending machines results in cost savings and reduced building cooling load. Standard refrigerated beverage vending machines use about 50 percent more power than ENERGY STAR certified vending machines. Talk with your property's vending operator about replacing non-ENERGY STAR vending machines with new or rebuilt models that conform to the latest ENERGY STAR performance standards, and use software or occupancy sensors to further increase their performance.
- **Check current refrigerators.** While your property's old refrigerator may still look good and work well, it could be costing your congregation over $300 per year to run, while using a significant amount of energy—in fact, more than twice the energy of a new ENERGY STAR certified model. However, even new refrigerator units can be run inefficiently. To help improve performance, position the refrigerator away from heat sources such as ovens and dishwashers, and leave a space between the wall and the refrigerator to allow air to circulate—this keeps the coils cooler so the refrigerator doesn't have to work as hard. Keeping the coils clean on the outside of the refrigerator is a great way to save energy as well. Also, consider unplugging the refrigerator when it is not in use, especially if it is only used for special events. Be sure to contact the manufacturer or consult the manual of your specific refrigerator model for usage, but it is generally recommended to unplug the refrigerator if it will not be used for a period of four weeks or longer.

By properly recycling a refrigerator manufactured 20 or more years ago and replacing it with a new product that has earned the ENERGY STAR, your congregation can save up to $1,100 and prevent up to 26,000 pounds of GHG emissions. For more information on making sure your old refrigerator is disposed of properly, see the EPA's Responsible Appliance Disposal (RAD) Program.

- **Have walk-in refrigeration systems serviced at least annually.** This includes cleaning, refrigerant top off, lubrication of moving parts, and adjustment of belts. This will help ensure efficient operation and longer equipment life.
- **Use multiple refrigerators only when necessary.** Work to reduce the use of multiple refrigerators: consider consolidating cooling needs into a single refrigerator and consider turning off an extra unit that is not needed. Many worship facilities may have an extra refrigerator in the basement for use in special occasions; if it is not used on a daily basis, look to use one main refrigerator and turn the basement one off unless really needed.
- **Turn off appliances** (such as the coffee maker) when not in use.

B.5 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

The HVAC systems in a worship facility represent the largest portion of most congregations' utility bills. Worship facilities have unique needs compared to other buildings because of their energy-use patterns. Most commercial buildings require relatively constant heating and cooling, but worship facility energy use tends to be higher on weekends and lower during the rest of the week (with occasional spikes for special meetings and other functions). Because most congregations use most of their facilities only a few days a week, controlling your energy use to meet these needs will help the property reach optimal energy efficiency. In addition to the recommendations in this section, many of the improvements discussed in other sections of this appendix can improve the efficiency of your property's HVAC system. For example, efficient lighting has less waste heat and can reduce air conditioning costs; making sure the property is well insulated will allow the HVAC system to work less to maintain desired indoor temperatures. Since replacing HVAC systems are often larger financial decisions, the information below can help your team maintain your existing system and create a replacement plan for a new system. In addition to the points below, see the ENERGY STAR Guide to Energy-Efficient Heating and Cooling.

- **Keep exterior doors closed while running the HVAC.** This simple action will help avoid wasteful loss of heated or cooled air.
- **Install a programmable thermostat to control the HVAC system.** Programmable thermostats allow you to optimize HVAC operation based on your property's scheduled use, and can be overridden as needed for unscheduled events. To ensure that congregation members, staff, and visitors always enter a comfortable facility, this "smart thermostat" can be scheduled to turn on the HVAC for a certain amount of time before arrival.
- **Check the accuracy of the thermostats.** The thermostats at your congregation can become dirty or damaged over time, causing them to read an incorrect temperature. This can lead to over-heating or over-cooling of the property and to higher utility bills. Your property's thermostats should be checked annually to make sure that they are working properly by comparing them to a thermometer. Ideally, your property's regular professional HVAC tune up should confirm the accuracy of the thermostat.
- **Change the filters.** To ensure maximum efficiency and air quality, HVAC filters should be cleaned and replaced at least quarterly, and even monthly during heating/cooling seasons. You can also clean and seal ducts to ensure they are not leaking.

Concerned about night setback and its effect on the pipe organ? The Associated Pipe Organ Builders of America says that temperatures as low as 45 degrees Fahrenheit will not cause damage to the organ; so normal setback ranges of about 55 degrees Fahrenheit to 60 degrees Fahrenheit should not be an issue.

- **Clean heating and cooling coils.** For the highest system efficiency, the place where air/water enters the HVAC system should be kept clean. Whether in an air handler or in a rooftop unit, the methods for cleaning include using compressed air, dust rags or brushes, and power washes. In addition, check baseboard heating systems for dust buildup, and clean them if necessary. This should happen twice a year—in the spring and in the fall.
- **Clear the clutter.** Make sure that fan coil units and baseboards are not blocked or covered by chairs, books, boxes, or file cabinets. Besides creating a fire hazard, blocking these units prevents proper air circulation. Always keep the area around supply and return vents clear.
- **Use fans when a room/area is occupied.** Comfort is a function of temperature, humidity, and air movement. Moving air can make a higher temperature and/or humidity feel more comfortable. Using ceiling fans allows the thermostat to be set as much as three to five degrees higher and the room feels just as comfortable as a lower temperature. Fans are most effective when the air movement is felt on the skin, and are a good choice for areas where occupants are in one place.
- **Schedule special events (such as choir practice or community events) and cleaning duties on the days just before and after major services.** This will help to ensure that the building is warmed or cooled on consecutive days to reduce energy consumption. Only heat or cool the part of the building where the event is occuring.
- **Tune-up the HVAC system with an annual maintenance contract.** Just like a new car, even a new ENERGY STAR certified HVAC system will decline in performance without regular maintenance. An annual maintenance contract automatically ensures that your HVAC contractor will provide pre-season tune-ups before each cooling and heating season. Use the tune-up appointment to have your contractor check for possible leaks in the property's duct system. Your congregation saves energy and money, and by paying annual maintenance fees up front, the system may last longer.

B.5.1 Should HVAC Equipment be run to Failure?

All types of equipment have a certain useful lifetime. This lifetime may be extended with regular maintenance, but at some point, the equipment will need to be replaced. Replacement offers an opportunity to invest in energy efficiency, and can impact energy consumption and costs for years.

Because major HVAC equipment (boilers, air conditioners and air handlers, chillers, etc.) typically has a long, useful life and a major impact on energy consumption, special attention should be paid to this equipment. Replacement of major HVAC systems is expensive, and for many congregations, HVAC replacement can have a big impact on finances. For this reason, you should check equipment periodically to estimate its remaining life. When the equipment is one to two years from the end of its remaining life, plans for replacement should begin—ideally choosing an ENERGY STAR certified unit. The difference between running to failure and scheduled replacement are best outlined through the following scenarios:

- **Scenario 1 – Run HVAC system to failure:** A worship facility in Minnesota has a boiler that provides hot water to heat the building. Although the boiler has been well maintained, it is 40 years old. On one particularly cold night, the boiler stops working entirely. The technician comes and says that it

can't be fixed. Although the building owners and operators knew that the equipment was old, they'd never really thought about it or planned for this occasion. Now, the congregation is facing a $60,000 dilemma. They must have a new boiler installed right away to keep the worship facility and all its uses functioning for the rest of the winter. They call the local boiler supplier, which carries a few models. The models that it usually stocks are not high-efficiency boilers, but they do have a lower up-front cost, and they're in the warehouse ready for installation. High-efficiency models are available, but they are more expensive, and aren't stocked in the supplier's warehouse now. The building owners choose the regular efficiency unit because it is available right away and is the cheapest. However, the cheapest unit is typically less expensive in terms of upfront costs, but not in lifetime costs in terms of operation, maintenance, and utility costs. The higher quality product may cost more initially, but will outlast and outperform a cheaper version for life-cycle savings.

- **Scenario 2 – Scheduled HVAC replacement:** This is the same worship facility as described in Scenario 1, but this is two years earlier, before the start of the heating season. The building owners and operators have a boiler technician come every year to tune-up the boiler and let them know how it's doing. This year, the technician informs them that the boiler will probably last this year and one or two more seasons. The congregation starts a capital campaign to raise money for a new boiler. They start talking to the boiler supplier about the different options available, and find out that the high-efficiency models are 20 percent more expensive up front, but that over their estimated 40-year lifespan, they take only a few years for the energy savings to make up for the extra cost. The people considering this decision take what they've learned to the other decision makers, and convince them that in the long run, the high-efficiency unit is a better deal, and will save the congregation on utility bills long after the extra cost. The congregation raises the money, and after the end of the heating season, the staff schedules the boiler replacement. The boiler that they want must be shipped in, which will take two weeks, but the weather is warm, so the boiler isn't needed. The boiler is installed, tested, and ready for the next heating season well ahead of time. The congregation is happy that utility bills will be lower for the life of the boiler.

In these two scenarios, the difference is that the second group had the time to sit back, think, and make a decision that made sense in the long run, rather than being limited by the situation at hand. By keeping a close eye on the condition of major HVAC equipment, congregations can plan and make the best decisions possible, which usually mean that equipment is not run to failure.

B.5.2 Applying the Concept

A major piece of equipment is most likely to fail when it is under the most stress or greatest demand. Therefore, it is likely to fail at the "worst possible time." Heating equipment is likely to fail on the "coldest day" and air-conditioning on the "hottest day." Without a planning and replacement strategy in place, a congregation can either "do without" or jump to a major purchase with too little research and too few good choices, and be faced with long-term cost implications. Regularly scheduled maintenance (at least annual or "pre-season") and a replacement plan are the responsible financial approach for your property and its vital HVAC equipment. ENERGY STAR has a checklist to help determine when it is time to replace your equipment.

B.6 WATER—HOT AND COLD

Energy and water efficiency are closely tied together. In most cases, electricity or natural gas is used to heat water, and this costs money. The more heated water your congregation consumes, the more you can save by optimizing water use. Additionally, treating and pumping water and wastewater may well be the number one use of electricity by your municipality. You can save water, energy, and money with the EPA's WaterSense program. The EPA created WaterSense to help American consumers and businesses use water more efficiently. Reducing water use lowers the costs associated with operating and maintaining equipment, as well as the energy needed to heat, treat, store, and deliver water throughout the property. WaterSense promotes water-efficient products and practices to help commercial and institutional facilities save water, energy, and operating costs. The WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities guide is a comprehensive guide to managing commercial water use. Read more on how to save water with the suggestions below.

- **Conduct a water assessment to identify major water uses within the property.** Look for opportunities for savings; use Portfolio Manager to track your water use across your property, compare your water use over time, and against other properties in your portfolio.
- **Use water-saving faucets, showerheads, toilets, and urinals to save water.** WaterSense-labeled products can save a great deal of water and therefore energy. For example, WaterSense toilets use 20% less water than those manufactured following the current federal standard. Replacing just one older inefficient urinal with a WaterSense-labeled model could save your property approximately 4,600 gallons of water per year.
- **Purchase an ENERGY STAR certified water heater when purchasing a new water heater.** If your water heater is outdated or working inefficiently, upgrading to an ENERGY STAR certified model will reduce water heating costs. All water heaters, especially gas-fired, should be inspected annually for safety as well as efficiency. Keep the immediate area around water heater clean and free of any debris, and allow nothing to be placed on top of the heater. In areas of infrequent water use, consider tank-less water heaters to reduce standby storage costs and waste. There are a few options when looking to purchase a new water heater:
  - ✓ **High-Efficiency Gas Storage:** High-efficiency gas storage water heaters work the same way as conventional gas storage water heaters but high-efficiency models have better insulation, heat traps, and more efficient burners.
  - ✓ **Gas Condensing:** Gas condensing water heaters operate similarly to conventional gas water heaters, but reduce the amount of gas required by the water heater by approximately 30 percent.

  - ✓ **Heat Pump:** Heat pump water heaters use electricity to pass vaporized refrigerant through a system containing a compressor, a condenser coil, and an expansion valve.
  - ✓ **Whole-Home Gas Tank-Less:** Whole-home gas tank-less water heaters work similarly to conventional gas types by heating cold water with a gas burner. However, instead of constantly maintaining a supply of hot water, tank-less water heaters only operate when hot water is needed. By only heating water on-demand, tank-less water heaters can substantially reduce energy consumption in some applications.
  - ✓ **Solar Water:** Solar water heaters come in a variety of designs, but all include a collector (a device that captures solar thermal energy) and a storage tank for hot water.
- **Insulate water heaters.** Install an insulation blanket on water heaters that are more than seven years old or that are warm to the touch; insulate the first three feet of the heated water "out" pipe on both old and new units.
- **Find and fix leaks.** Small leaks mean many gallons of water and dollars are wasted each month. Water conservation saves energy and money, especially for hot water. Since electricity is also required for purification of drinking water, treatment of waste water, and pumping of water, fixing leaks will save energy.
- **Set water temperature only as hot as needed.** Typically, hot water should only be heated to 110 to 120 degrees Fahrenheit. This prevents scalding and saves energy. Remember to check local codes for specific temperature requirements.
- **Optimize the amount of water used in heating and cooling systems.** Evaluate cooling towers, chillers, and other large systems to ensure they are running as efficiently as possible. Eliminate single-pass cooling systems wherever possible by re-circulating water or reusing the water for another purpose instead of sending it down the drain.
- **Practice water-efficient landscaping.** Planting native and regionally-appropriate plants on the grounds of your property can reduce the need for extensive outdoor watering in the summer. Reducing the amount of turf grass can also save water—turf grass receives the highest percentage of irrigation water in traditional landscaping, much more than landscapes planted with a mix of trees and shrubs. If an irrigation system is used, be sure it has been installed correctly and have it checked for leaks on a regular basis to avoid wasting water. Native trees and other plants can shade and cool your "micro-climate" by several degrees and are less vulnerable to local insect pests than non-native species. WaterSense has many resources on how to save water outdoors.

Appendix C – Energy Audits and Professional Assistance

Whether you are thinking about upgrades for equipment that obviously needs replacing or don't know what equipment may need replacing, you may wonder, "Where should I start?" and "Do I replace one piece of equipment or system at a time or should I do a comprehensive upgrade of my entire facility?" The answers to these questions will vary depending on your facility—these may include the age of your current equipment and facility systems, your local utility rates, your hours of operation, your level of contentedness with your current equipment and systems, and your access to capital are all key factors in what level of upgrade makes sense. One place to start is with low-cost and no-cost Sure Savers (see *Appendix B*). Once these have been implemented, and the property has used Portfolio Manager to benchmark energy use, an audit may help you determine what additional projects make sense. Refer to resources in *Appendix D - Project Financing*, for ideas on how to pay for your audit.

This appendix can help your congregation determine if an audit is appropriate and, if so, how to choose the type of audit. This appendix tells you:

- What an energy audit is, what types of audits are available, and who can perform them.
- How to prepare for an audit.
- What you can expect the audit to include.
- Where to find more audit resources.

C.1 What is an Energy Audit?

Energy audits are comprehensive reviews conducted by energy professionals and/or engineers that evaluate the actual performance of your property's systems and equipment against their designed performance level or against the best available technologies. The difference between the actual performance and designed performance is the potential for energy savings. Whether your congregation has seating capacity for 100 or for 1000 worshippers, you can likely benefit from an energy audit. Be aware—audits alone don't save energy; you need to implement the recommended improvements to reap benefits.

Money saved due to implementing auditor-recommended improvements may justify the up-front cost of the audit. However, your budget may limit the types of audit that would make financial sense, because recommended improvements that are not performed shortly after the audit can become outdated. If your congregation has limited property improvement funds, an audit targeting specific types of projects may be the most cost effective as it will recommend projects your congregation can implement in a short time frame with allotted project funds. This section will help you understand the types of audits and auditors to determine if an audit would benefit your congregation.

C.1.1 Types of Energy Audits

If your congregation decides to conduct an energy audit, you will need to choose which type of audit is the best fit by considering the property type to be audited, the cost of the audit, your Energy Team's project goals and access to funding, and the implementation timeline. For example, a detailed energy audit might not make sense for a small facility or one that does not have financing to implement the projects identified by the audit. It is wise to start with benchmarking and implementing the Sure Savers and other steps described in *Appendix B*, to see what you can save prior to an audit.

ASHRAE AUDITS

If your congregation owns its own buildings, your Energy Team may consider a professional audit. There are several types of energy audits that survey your property at different levels of detail. The types of audits as defined by American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) standards are:

- ASHRAE Level I – Walk-Through Analysis
- ASHRAE Level II – Energy Survey and Analysis
- ASHRAE Level III – Detailed Analysis of Capital-Intensive Modifications.

These audits are described in detail below. Although the accuracy of the audit is directly related to the level of detail (e.g., a Level III audit is more accurate than a Level II audit), the most extensive and accurate audits may not be necessary or cost effective to accomplish your goals.

Types of ASHRAE Energy Audits

ASHRAE Level I - Walk-Through Analysis: Focuses on low- and no-cost energy conservation measures, and provides a list of higher cost energy conservation measures. Typically, these audits will result in a report about how much energy and money can be saved from specific efficiency opportunities. If you have benchmarked your building and implemented the Sure Savers, you will have already completed most of the analysis that this type of audit provides.

ASHRAE Level II – Energy Survey and Analysis: Expands on the Level I audit by including more detailed energy calculations and financial analysis of proposed energy efficiency measures. The financial analysis used is typically a life cycle analysis, which allows you to better understand the financial benefits of installing energy efficiency measures. You are typically provided with a list of energy conservation/efficiency measures, an estimate of the amount of money and energy that will be saved,

and an estimate of the amount each measure will cost. These reports should also include any changes that need to be made to operations and maintenance procedures.

ASHRAE Level III – Detailed Analysis of Capital-Intensive Modifications: Expands on the previous levels of effort and is based on a specific subset of energy conservation/efficiency measures to analyze further. This may include further refinement of an energy model or more extensive data collection. These are often used to provide detailed information to lenders for larger projects.

C.1.2 Finding an Energy Auditor

Unless you conduct an audit yourself, you can choose from four main types of energy audit providers: 1) utility companies, 2) private sector companies, 3) state energy offices, 4) faith-based non-profits. The following paragraphs describe these types of auditors in more detail.

Your utility company may offer free or inexpensive energy audits and/or have an energy conservation department.

Private-sector companies include consultants, energy service companies (ESCOs), and ENERGY STAR service and product providers (SPPs). These companies can conduct audits, evaluate and recommend projects to improve building energy efficiency, and can estimate energy use, savings, and project cost:

- **Energy consultants** can sometimes prepare project specifications or engineering designs. Energy consultants do not usually provide financial or management services and they are not involved in the actual project implementation process.
- **ESCOs** have the goal of being hired by your property to install and manage the projects they recommend. For this reason, ESCOs have a vested interest in the completion, operation, and resulting savings from your projects, and will guarantee positive results as part of a long-term performance contract. Some ESCOs also provide financing and equipment maintenance. The major difference between ESCOs and energy consultants is the financial arrangement. ESCOs will often pay the up-front costs of implementing the efficiency projects, and will be paid through the savings achieved. This can be a good option for congregations that don't have access to capital to implement the projects on their own.
- **SPPs** (which can include energy consultants and ESCOs) are companies that assist commercial buildings operate more efficiently by helping clients benchmark energy performance, improve efficiency, and earn recognition. ENERGY STAR maintains a list of service and product provider (SPP) partners. To partner with ENERGY STAR, a company must demonstrate a minimum level of past and ongoing experience working with Portfolio Manager and earning ENERGY STAR certification for their client buildings.

Your state energy office may offer free or inexpensive energy audits. The National Association of State Energy Officials (NASEO) State and Territory Energy Offices has an interactive map to highlight state energy offices.

Certain faith-based nonprofit groups provide energy services for free or reasonable fees; ENERGY STAR has a listing of external faith-based stewardship organizations that may be able to help. A few to consider include GreenFaith and state affiliates of Interfaith Power and Light.

C.1.3 Contracting a Private Company to Perform Your Energy Audit

Once your congregation has reviewed the types of audits and auditors available, you may choose to hire a private sector company for an audit—be sure to see what pro bono options may be available to you prior to hiring a professional. In this case, you can either select the company by sole source or competitive bid. In a sole source selection, you negotiate with a single consultant/ESCO. In a competitive bid, you advertise your team's need for a consultant/ESCO, and receive bids from firms interested in doing business with you.

If your congregation owns its own property, you are well-suited to negotiate exclusively with a single consultant/ESCO. When hiring via sole source selection, your team can negotiate until a mutually agreeable cost is reached. During these negotiations, be sure to understand the scope of the audit and its minimum reporting and analytical requirements; more specifically, ensure that assignments, deliverables, and schedules are clear and understood by all parties.

The major drawback to sole source contracts such as these is that they can be costlier than competitive bid contracts due to a lack of market competition. However, establishing a long-standing working relationship will allow the consultant/ESCO to become familiar with your property's energy equipment, needs, and problems, and will also negate the need for your team to review proposals for each separate project. Understanding the prices of competitive bid contracts in your area prior to negotiating the price of a sole source contract will help derive the benefits from a sole source contract at a competitive market price.

C.1.4 Your Energy Team's Role

If you hire an outside auditor, your Energy Team will be responsible for monitoring the auditor's activities. This section outlines steps and activities for your Energy Team to ensure the audit's success:

- If your congregation plans to solicit competitive bids for your audit, the Energy Team can prepare a Request for Proposals (RFP) to hire an auditor. ENERGY STAR has a sample RFP to assist you in preparing this document.
- Your team should familiarize themselves with the building in terms of equipment, energy use, and design (mechanical and electrical).
- You will need to manage the energy auditor through maintaining communication with decision-making staff and overseeing the auditing work.
- Review the energy audit:
  - ✓ Be aware of the types of improvements the property is interested in and their relative priority.
  - ✓ Check to make sure that the assumptions used in the audit calculations make sense with respect to how the building operates.

- ✓ Create a final report based on the audit results, and produce a detailed summary of actual steps that can be taken to reduce energy use. The report should recommend actions from simple adjustments in operation to equipment replacement. Estimates of resource requirements for completing actions should be included.

Your team's financial representative is best suited to prepare the RFP. The building operator and technical mind team members should be familiar with the building equipment, design, and operations. The financial representative, building operator, technical mind, and team leader should work together to manage the energy consultant and review the energy audit about their areas of expertise.

C.2 Pre-Audit Checklist

Once your Energy Team has chosen an energy auditor, you will need to prepare for their visit. You can help your auditor determine appropriate project recommendations by answering questions about your property's energy use and construction. If your congregation owns its own building(s), providing the consultant with electrical and mechanical drawings of the property will help the auditor perform the job, and will also help control costs; if electrical and mechanical drawings are unavailable for your property, the consultant will need to reconstruct a schematic for equipment operations.

Reviewing a consultant's work can be done internally if your team already has a staff member who is familiar with energy auditing methods and the projects recommended by the auditor. If your property does not have such a person (or group of people) on staff, this may be an opportunity to seek help from a qualified volunteer in your congregation. Consult your local utility or state energy office for assistance. You should have an up-to-date Portfolio Manager account for your property with at least 12 months utility data included. This will ensure you have the needed data for an audit, such as property use, a list of on-site equipment and associated use profiles, energy costs, and newly implemented projects and upgrades (without knowledge of new project implementation, the audit may assume your property has been using current equipment for the past 12 months).

C.3 What to Expect

C.3.1 Analysis of Existing Equipment

Depending on the type of energy audit your team chooses, you should expect specific things from the auditor. When negotiating with a sole source, or stating your team's project requirements in a competitive bid RFP, be sure to specifically indicate the requirements of the audit. To get a better idea of what an energy audit will include, see the audit types listed below. You can also do a search for "sample energy audits" on the internet to see many different examples.

Types of Energy Audits

Targeted Lighting: Targeted lighting audits typically include, at a minimum, a count of the number and types of fixtures in each room and spot checks of light levels.

Targeted HVAC: Targeted HVAC audits include computerized simulations to extrapolate annual operating energy use based on equipment set points and regional weather factors.

Comprehensive: Comprehensive audits evaluate the building envelope, lighting, domestic hot water, HVAC, kitchen equipment, and controls in the property. Computer models are used to simulate building and equipment operations, considering weather, equipment set points, hours of operation, and other parameters. Estimated energy consumption is compared to the property's utility bill charges to ensure that the consultant is not over- or underestimating energy savings from proposed investments.

C.3.2 Project Implementation

Having the consultant who performed the energy audit also prepare a performance specification will help to ensure that your property selects appropriate project types and specifies adequate project quality. Performance specifications will inform equipment contractors and installers about the type of project your team is undertaking. Performance specifications may add up to a few cents per square foot to the cost of a single-purpose or comprehensive energy audit.

Appendix D – Project Financing

One of the challenges a congregation may face when looking at implementing energy efficiency upgrades is the upfront costs of new equipment and appliances. Usually, these upgrades save you money over time—money that can be used to pay for the cost of future projects. When looking at the project financing this way, you can plan forward, allowing you to draw on dollars saved from future energy bills to pay for new, energy-efficient equipment and projects today. Some upgrades require little funding. For those that do require investment, there are many traditional and non-traditional financial resources available.

For small, inexpensive projects, you may want to use your own internal funds to pay for the upgrade to keep your payback period low and return on investment high. For larger jobs, financing might be the only way to pay for the upgrade. It's your decision to weigh competing needs for capital versus continuing increases in operating costs for energy. But remember—even a longer return-on-investment energy efficiency upgrade results in affordable comfort, and new, more reliable equipment. Strategic energy efficiency investments are your hedge against the certainty of higher utility bills that you cannot control. This appendix highlights:

- Where to find ENERGY STAR calculators to inform your decision-making process.
- How to pay for upgrades.
- What factors to consider when choosing financing.
- Why you may consider a utility bill audit.

D.1 ENERGY STAR CALCULATORS

ENERGY STAR offers online calculators to help you determine a best course of action for your congregation's planned energy efficiency projects. The Cash Flow Opportunity Calculator at can help you answer three critical questions about potential energy efficiency investments:

- How much new energy efficiency equipment can be purchased from anticipated savings?
- Should you finance the equipment purchase or wait and use cash from a future budget?
- Is money being lost by waiting for a lower interest rate?

The ENERGY STAR Financial Value Calculator helps you quantify the value of improvements in energy efficiency to your organization. The calculator uses the prevailing price/earnings ratio to estimate the market value of increased earnings that can result from increased energy efficiency.

D.2 HOW TO PAY FOR UPGRADES

Today there are many opportunities to finance energy efficiency projects—whether through energy performance contracting, loans, commercial leases, grants, or financial advisory services. This section

contains information on the different types of financing options that may be available to your congregation. It also lists factors to consider when deciding which type of financing to use for a project.

Although the right financing option depends on many factors—such as debt capacity, in-house expertise, and risk tolerance—there are viable options for virtually any type of organization to implement a well-designed project. You may choose to fund projects with cash or savings, utility incentives or rebates, grants, loans, or a combination of these. ENERGY STAR has online resources for finding project financing.

D.2.1 Cash or Savings

A cash purchase is the simplest method for financing energy performance improvements. It is well suited for small or low-risk upgrades and makes sense if your congregation has cash reserves and a strong balance sheet. The advantage of a cash purchase is that all cost savings realized from the upgrade are immediately available to your organization. Generally, relatively inexpensive, simple efficiency measures that are likely to pay for themselves in about a year are purchased with cash. Generally, relatively inexpensive, simple efficiency measures that are likely to pay for themselves in about a year are purchased with cash because the costs of acquiring financing (e.g., the cost to borrow money, the cost of time invested in researching opportunities, etc.) may exceed the projected savings. If your congregation has identified low-cost improvements but does not have the cash for them, your team can consider holding a fundraiser with all proceeds going specifically to the upgrades.

D.2.2 Utility Incentives or Rebates

Utilities often provide financial incentives for energy performance upgrades, fuel switching, and even energy audits. They also sometimes provide low-interest loans. Check with your local utility to learn which programs are available. Your organization may also be eligible to receive immediate rebates on purchases of ENERGY STAR certified equipment. See the ENERGY STAR online Rebate Finder to find special offers and rebates from ENERGY STAR partners in your area. Another good source of rebate information is the Database of State Incentives for Renewables and Efficiency (DSIRE), which contains local, state, federal, and utility rebates. The federal government and many states reward efficient building upgrades with tax incentives. Because congregations do not pay taxes, they are not eligible for these types of incentives. However, a private donor (in consultation with their accountant) might be eligible for tax deductions for energy efficiency capital improvements donated to your worship facility.

D.2.3 Energy Upgrade Grants

Grants for energy upgrades are usually better suited for larger projects that require extra funding because the process of applying for a grant requires time and resources. Because finding and applying for grants can take a large amount of time, you should implement Sure Savers (*Appendix B*) and look for rebates before you apply for grants. Energy grants come from many sources—from state and federal governments and from other organizations. Some grants require matching funding from your organization; some will provide a portion of the funding for a specific type of project; others will fund a complete upgrade.

Grant opportunities can come up quickly with short deadlines. To keep up with opportunities now and on the horizon, your congregation could have someone from your Energy Team track grant deadlines and requirements. You should also keep a file of past grant proposals and general information to be able to quickly put together a new proposal. Energy audit reports are often a good source of information when preparing a grant proposal. Because grants are time-consuming efforts with a quick turnaround, consider whether time spent pursuing grants may be better used elsewhere. Some current grant programs that are currently available are listed below.

State programs: Grants for efficiency upgrades vary from state to state. The Database of State Incentives for Renewables and Efficiency (DSIRE) has state-by-state listings for all renewable energy and energy efficiency financing options, including grants, loans and tax incentives. The National Association of State Energy Officials (NASEO) lists all State and Territory Energy Offices which may have state-specific funding resources.

Religious organizations: If your congregation belongs to a larger religious organization, you should ask if there are any green/efficiency grants available. For example, the Christian Reformed Church began funding for a grant called the U.S. Green Congregation Grant. To apply, churches must demonstrate how they can integrate environmental concerns into their teachings. ENERGY STAR has a growing list of links to external faith-based organizations who may be able to help.

State Interfaith Power and Light (IPL) organizations: IPL has affiliates in most states and can help connect your congregation to larger state-wide energy efficiency initiatives. Some IPLs also have grant programs of their own.

Other programs: There may be other programs that offer loans and/or grants for efficiency upgrades. For example, the Office of Energy Efficiency and Renewable Energy's Better Buildings Neighborhood Program helps state and local governments develop sustainable programs to upgrade the energy efficiency of homes and buildings. The Local Government Commission (LGC) has compiled a listing of energy-related financing, incentive, and education programs.

D.2.4 Loans

If you are not able to fully fund your project work through cash, grants, and other avenues, your congregation may want to consider taking a loan for part of the initial investment. Lenders may require a down payment on loans for energy projects. Your borrowing ability will depend on current debt load and creditworthiness. Loan payments may be structured to be equal to or slightly lower than projected energy savings, creating a positive cash flow. In this financing arrangement, your congregation will bear all the risks of the project and receive all the benefits.

D.2.5 Equipment Leasing

Instead of paying for an entire upgrade in full, your congregation may decide to set up a leasing agreement and make payments over time. Leasing agreements may be with a specific retailer or contractor. Laws and regulations for equipment leasing are complex and change frequently, so be sure to consult your financial advisor(s) before entering into a lease agreement. Also note that lease terms

may charge a higher interest rate than a loan, so be sure your Energy Team considers the total ownership cost of leasing versus taking out a loan before deciding. For more details on equipment leasing, see Chapter 4 of the ENERGY STAR Building Upgrade Manual.

D.2.6 Performance Contracting

Performance contracting (sometimes called "shared savings") is the most complex type of arrangement, but offers your congregation the benefit of risk protection. It is also the costliest financing option because of the amount of monitoring and verification required, and is usually used for larger scale upgrades or for larger facilities. However, even this more expensive alternative can yield a positive cash flow for your congregation immediately upon installation.

In a performance contract, payment for a project is contingent upon its successful operation. For an energy efficiency upgrade, services are rendered in exchange for a share of the future profits from the project. A performance contract can be undertaken with no up-front cost to your congregation (as the building owner) and is paid for out of the resulting energy savings. The service provider, often an ESCO, obtains financing and assumes the performance risks associated with the project. The financing organization owns the upgraded equipment during the term of the contract, and the equipment asset and debt do not appear on your balance sheet. Financing for performance contracts is based on the cost savings potential of the project. Performance contracting can be applied to purchases or leases. If your team is interested in more details on performance contracting, see Chapter 4 of the ENERGY STAR Building Upgrade Manual and the ENERGY STAR Performance Contracting Best Practices guide.

D.2.7 Property Assessed Clean Energy (PACE)

PACE (Property Assessed Clean Energy) is a means to finance energy efficiency, renewable energy, and water conservation upgrades to buildings. PACE can pay for new heating and cooling systems, lighting improvements, solar panels, water pumps, insulation, and more for almost any property such as homes, commercial, industrial, non-profit, and agricultural. It works by PACE paying for 100% of a project's costs with a 20-year repayment schedule that is added to the property's tax bill. PACE financing may stay with the building upon sale and is easy to share with tenants.

D.2.8 Group Purchasing

Another way to fund your congregation's projects is by reducing initial outlay through group purchasing. Why pay more than you must for efficient products and equipment? Perhaps a group of congregations could work together to pool your buying power for volume discounts.

D.3 Choose How to Finance the Project

Choosing which type of financing you will use requires a full evaluation of your options. Your Energy Team will need to consider the size of the project and then look at the factors listed below.

Factors to Consider when Financing the Project

Balance Sheet: How much money your congregation has on hand versus its debts. Ensure that any investments your team makes do not leave your congregation with too much debt.

Initial Payment: A large purchase may be an obstacle for some congregations planning energy efficiency upgrades. If your congregation has large capital reserves or is planning a small project, it makes sense to pay for the project with cash because all the cost savings from the project will be immediately available to offset the original investment. There are financing options that can move a project forward with no initial capital outlay. If resources are tight, you may want to consider a performance contract.

Payments: Your congregation's goal is to obtain financing at a minimum cost. If your congregation does not have enough cash on hand to make a full purchase, determine the monthly payments (through a loan or leasing) that fit into your budget.

Ownership: If your congregation owns its energy efficiency upgrade equipment, it will receive all the savings; however, it is also liable for any performance risk associated with the equipment.

Performance Risk: There is risk associated with any investment. Energy efficiency upgrades can be low-risk investments because they apply proven technologies with long records of performance. However, the financing option your team chooses will affect who bears the risk of performance failure.

Performance risk of energy upgrades depends on the accuracy of the assumptions about maintenance, cost of energy, occupancy, and other factors. For example, lighting upgrades are typically considered a lower risk investment than HVAC investments because lighting use is largely consistent and does not vary with the outside temperature. It can be difficult to predict energy savings from HVAC upgrades because HVAC performance is impacted by the property's ventilation system (e.g. clogged ducts, vents stuck open) and other factors that may not be visible.

D.4 Consider a Utility Bill Audit

Have you considered whether your worship facility's utility bills are accurate? You wouldn't pay your restaurant bill without a quick review, so what about your major monthly costs for utilities? Professional consultants who analyze utility bills say that an estimated 85% of congregations are overcharged on utility expenses through calculation errors and other discrepancies billed by utility providers. This may sound self-serving coming from someone who provides such an analysis service for a fee. However, utility bill audits are typically performed on a contingency basis, which means you have no out-of-pocket expenses; you pay only if any refunds are recovered and you pay a percentage of the monies recovered. If no refunds are recovered, you pay nothing.

Saving Money with Utility Bill Analysis

One congregation with an estimated annual utility budget of $55,250.00 saw a first-year annual savings of $26,000 after utility bill analysis. These savings were a result of a free utility bill analysis of the immediate 36-month worship facility payment history. The analysis reviewed electricity, telecommunications, water, sewer and storm drainage bills, and uncovered simple billing errors, omissions of payments, and improper rate coding over the specified period. The cost for this service was paid out of the savings and if no savings had been found, there would have been no fee for the analysis. Going forward, the congregation can expect significantly lower utility bills. Utility bill analysis is not part of the ENERGY STAR program, but EPA recommends it worth considering, because it could help call attention to costly leaks in water pipes and fixtures, as well as leaky heating/air-conditioning ducts.

How do you check and verify your utility bills? Do you approve their charges based upon trends, budget, or just pay them because they look right and fit the budget? Do you know that professional analysts say most mistakes are approximately 10% of the bill amount and routinely repeated month after month?

Depending upon the physical property, a congregation's utility expenses can often represent the second or third largest budget expense after personnel costs. Your utility expense is an operational cost that you can reduce, not only with ENERGY STAR strategic energy and water management, but by making sure the cost is correctly calculated at the correct rate classification. Correcting utility billing errors can generate significant savings—some as direct rebates and others as rate corrections that result in long-term savings.

More than likely you routinely conduct Financial Audits, General Compliance, Charitable Gift Acknowledgement Receipts, Insurance, and Cash audits. Now you know that you can also undertake a no-risk audit of all your utility expenses. This audits your utility bills; electricity, natural gas, heating oil, telecommunications, water, and sewer. A utility bill audit will refund and remove all erroneous and unnecessary overcharges which results in ensuring that your utility bills are 100% accurate and efficient. This is potentially a great source for raising capital and reducing your operational expenses.

Appendix E – Working with Contractors

Once your team has determined the projects for which your congregation needs to hire a contractor, you will need to find a contractor who will operate within your organization's budget. You may locate a contractor by competitive bid, or based on their qualifications.

Previously this workbook advised taking advance of congregational time and talent. This includes not only congregation members who are in the energy efficiency service and product industry but also any long-time contractors who may feel entitled to manage new projects. However, even contractors of long-standing and good service may not have the technology and up to date knowledge on efficiency that you need. This is a business decision regarding your fiduciary responsibility and merits competitive bidding.

In whatever way you ultimately select a contractor, make sure to obtain the information listed below when assessing prospective contractors.

Information to Obtain from Prospective Contractors

References: Ask the contractor to provide multiple current references for work the contractor has performed.

Proof of license and insurance: Make sure the contractor is licensed and insured, including workers' compensation insurance.

Follows regulations: Ask the contractor to certify that their work conforms to state and local regulations and codes.

Has experience: Make sure the contractor has experience with and will use energy-efficient equipment as specified in the project designs.

Uses Portfolio Manager: Check whether the contractor is involved with ENERGY STAR, or benchmarking through Portfolio Manager. This will help your property remain consistent in its approach.

Availability and communication skills: Check the contractor's availability and make sure they have good communication skills.

Provides cost estimates in writing: Ask the contractor to provide a cost estimate in writing for any work they will do before signing any contract.

ENERGY STAR has an online list of tips on hiring contractors you can review.

E.1 Selecting a Contractor by Competitive Bid

To select a contractor by competitive bid, issue a Request for Proposal (RFP) to which prospective contractors interested in undertaking your project will bid for the job. ENERGY STAR has a sample RFP to

assist you in preparing this document. When evaluating contractors' bids, pay attention to the proposed scope of work they describe; not all bidders will offer to undertake all tasks listed in the RFP.

Competitive bids are useful to property managers because they allow the manager to negotiate prices between multiple contractors at once. Think of how you purchase a new car: you don't go to one dealer; you often go to several to compare and then negotiate prices. Similarly, your team can negotiate the proposed scope of work and proposed contract cost between contractors, encouraging the contractors to lower their prices and expand their proposed scope of work to remain competitive for your budget.

The downside is that competitive bids can take time, and your congregation's project must be large enough for the contractor to find it profitable. If your congregation wants to invest in many technologies, or to renovate a part of your building's infrastructure, a competitive bid may be the most effective option. However, if your congregation is trying to install a few specific technologies, selecting a contractor by qualification may make more sense for your energy stewardship team.

E.2 Selecting a Contractor by Qualification

When selecting a contractor by qualification, you should identify the contractors your team is interested in considering and assess their qualifications. Specifically, you should ask the questions listed in the introduction to this section, and should interview past clients and references. Based on your team's evaluation of the contractor's responses and those of their past clients and references, you can decide whether to hire him to undertake your project.

Selecting a contractor by qualification may be preferable for some congregations, as it allows your team to work more intimately with the contractor to specify details of the work they will do, and negotiate the extent to which they will assist your team. Unlike a competitive bid, selecting a contractor based on qualification does not allow you to negotiate prices or scope of work with multiple contractors simultaneously. Instead, your team will need to be familiar with the typical costs in your area for the types of projects your congregation is implementing.

E.3 Performance Contract: Using an ESCO

A performance contract is where a congregation hires an ESCO to develop, install, finance, and verify energy efficiency improvements. In return for the ESCO assuming the up-front costs associated with the investments, the congregation agrees to give the ESCO a portion of its energy savings over a period specified in the contract. Usually, ESCOs will focus on larger energy use facilities to make it worth their expense. If your congregation has a smaller property, it will most likely use a local contractor rather than an ESCO.

A performance contract may be attractive from an immediate financial standpoint, but the level of control exerted by the contractor may be unfavorable. The contractor will be entitled to a portion of your congregation's energy savings for a contractually specified length of time after the energy project is completed, limiting the amount of money saved that can be repurposed in your congregation's ministry. However, if your congregation does not have the necessary resources to implement projects or monitor

energy management, a performance contract may be a convenient way to overhaul your property's energy-consuming equipment and practices.

E.4 Negotiating a Contract

The quality of your contracting experience will be determined in large part by how you negotiate the contract. When drafting the contract, remember that this document will define all interactions between your team and the selected contractor. Therefore, the contract should address all stages of involvement, from planning and decision making, to documentation and monitoring of the investments after installation. If the contractor isn't going to monitor the performance of the equipment after it has been installed, make sure that they agree to provide you with all the knowledge and resources necessary to allow your team to monitor, maintain, and manage the equipment over time.

E.4.1 Contract Specifics

Before you sign any contract on behalf of your congregation, make sure the contract specifies the items listed below.

Contract Specifics to Confirm

- ✓ **Processes and Procedures:** Processes and procedures that the contractor agrees to undertake.
- ✓ **Activity Schedule:** A schedule of activities, including major milestones and due dates.
- ✓ **Contractor and Customer Roles:** The roles of team members, both of contractor personnel and your staff. This is very important to ensure that there is no duplication of effort which may result in higher costs for the project.
- ✓ **Sample Forms and Templates:** Sample forms and templates the contractor will use for documentation. Review these documents, and ask for clarification of any parts of the forms that are not clear.

E.5 Managing a Contractor

When working with a contractor, the extent of your management responsibility will be defined in the contract you have agreed upon. Usually, the day-to-day management of the project is the contractor's responsibility. As the customer, you should facilitate the contractor's work, and make sure that the contractor is adhering to the contract. Schedule regular meetings to check in with the contractor and track their progress. After the project is completed, remember to ask the contractor to provide documentation about how to maintain the performance of the project's installed equipment, and of how frequently maintenance of the equipment is recommended.

Appendix F – EPA's Food Recovery Challenge

The amount of food wasted in the U.S. is staggering. The US generates more than 36 million tons of food waste each year. Since 2010, food waste is the single largest component of municipal solid waste reaching landfills and incinerators.

Generating food waste has significant economic, social, and environmental consequences. Often, simple changes in food purchasing, storage, preparation, and service practices can yield significant reductions in food waste generation. Not only will this reduce waste, but it will make food dollars go further. Food waste cost savings have even greater potential at commercial food-based businesses. And much of this food "waste" is not waste at all but safe, wholesome food that could potentially feed millions of Americans in need. Food donations redirect these valuable resources to "feed people – not landfills."

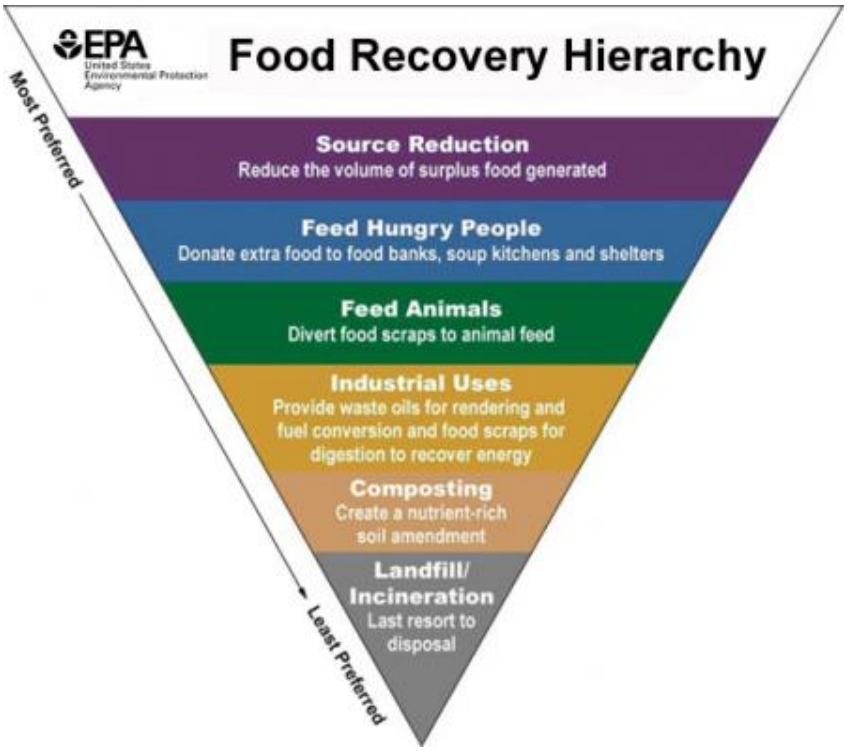
Additionally, not only does this wasted valuable resource have huge economic and social impacts, it also has huge and immediate environmental impacts. When food is disposed in a landfill it quickly rots and becomes a significant source of methane. Reducing, recovering, and recycling wasted food diverts organic materials from landfills and incinerators, reducing GHG emissions from landfills and waste combustion. The use of recycled food scraps (compost) has many environmental benefits.

An additional benefit of food waste reduction, donation, and composting is improved sanitation, public safety and health for both your facility and congregation.

THE FOOD RECOVERY HIERARCHY

Both EPA and the USDA recommend following the "food recovery hierarchy" as the preferred options to make the most of excess food. The food waste recovery hierarchy comprises the following activities, with disposal as the last, and least preferred, option:

- Source Reduction – Reduce the amount of food waste being generated.
- Feed People – Donate excess food to food banks, soup kitchens, and shelters.



- Feed Animals – Provide food scraps to farmers.
- Industrial Uses – Provide fats for rendering; oil for fuel; food discards for animal feed production; or anaerobic digestion combined with soil amendment production or composting of the residuals.
- Composting – Recycle food scraps into a nutrient rich soil amendment.

JOIN EPA'S FOOD RECOVERY CHALLENGE

Save money and reduce your environmental footprint by joining EPA's Food Recovery Challenge (FRC). It just takes 5 easy steps:

1. **Sign Up**
   - ✓ Go to the SMM Data Management System to register to participate in the Challenge.
   - ✓ Once your account has been activated, choose the "Food Recovery Challenge" (FRC) and sign the participation agreement.

2. **Set a Baseline**
   - ✓ **Assess It!** Conduct an inventory of your food waste. Baseline data provides a starting point for setting goals and tracking progress. We recommend that your baseline data be representative of 12 prior months of food data.
   - ✓ **Submit It:** Baseline data must be entered and submitted through the SMM Data Management System within 90 days of registering for the Challenge. Choose from three food diversion categories: food waste prevention (e.g. source reduction), donation, and/or recycling (e.g. composting and anaerobic digestion). Don't forget to click the "submit" button in the database.

3. **Set a Goal**
   - ✓ **Choose Your Actions:** Choose the activities your organization plans to undertake. Examples are modifying food purchasing, changing food production and handling practices, reducing excessive portion size, donating to those in need, and recycling.
   - ✓ **Submit It:** Goals must be entered and submitted through the SMM Data Management System within 90 days of registering for the Challenge. Identify a quantitative goal, expressed in tons for the current calendar year. Don't forget to click the "Submit" button in the database.

4. **Take Action**
   - ✓ Undertake the identified activities to reduce your food waste.

5. **Track It**
   - ✓ Track your progress, report your food diversion results, and establish new goals annually using the SMM Data Management System by March 31 each year. Don't forget to click the "submit" button in the database.

Appendix G – Saving Water and the Soak Up the Rain Campaign

Hard surfaces such as building roofs, parking lots, patios, sidewalks and roads—also called impervious areas—prevent rainfall from infiltrating naturally into the ground. Urban development can result in large amounts of stormwater (also known as runoff) entering streams, lakes, rivers, wetlands, or oceans through storm drain systems. Stormwater can become polluted by oil and other contaminants on parking lots, pesticides and fertilizers on lawns, and soil eroded from bare ground.

Sustainable stormwater management—also known as green stormwater infrastructure or low impact development—can be used to absorb and treat stormwater close to where the rain falls, which reduces impacts to lakes, streams and estuaries. Filtering water through soil and vegetation helps clean it and reduces the amount of water and associated pollutants that flow untreated to storm drain systems and local waterways. Sustainable stormwater management practices are designed to protect and restore the landscape so the developed areas have less of an impact on local and regional water resources.

Best practices for controlling stormwater can be integrated into existing features of the built environment (e.g., buildings, streets, parking lots, and landscaped areas). These practices are appropriate for most settings, from urban cores and suburbs to rural areas. The practices can include rain gardens, swales and conservation landscaping which are common natural solutions. These practices are designed to capture stormwater, filter it through vegetation and soils, and infiltrate it into the ground. Vegetated stormwater management practices that include green roofs can also be beneficial to wildlife when planted with native and locally adapted plants. Other practices such as downspout disconnection, permeable pavement and water harvesting can work in conjunction with these other tools to capture and filter or temporarily store rainwater on site to help protect stream channels from erosion and to reduce localized flooding. Conservation landscapes are also beneficial because they generally require less water, fertilizer and pesticides than do traditional landscapes. They also are designed to reduce power equipment use and associated fuel and energy consumption.

The creation of sustainable stormwater features can provide many benefits to the congregation and the larger community. Some of these benefits include:

- Fulfilling the congregation's call to care for the land, sustain life and conserve resources.

- Beautifying congregation grounds to provide a peaceful place to pray, meditate and connect.
- Enhancing wildlife habitat, including habitat for butterflies, birds, pollinators, frogs and turtles, and small mammals.
- Improving water quality, reducing flooding in local streams and decreasing the risk of property loss.
- Providing cool shade to otherwise hot parking lots.
- Reducing costs associated with irrigation and other inputs (as highlighted by the WaterSense Program).
- Teaching the congregation how to share these ideas beyond the place of worship.

Soak Up the Rain is a stormwater public outreach campaign to raise awareness about the problem of polluted stormwater runoff and to encourage citizens, municipalities and others to take action to help reduce runoff and its costly impacts. We can all be part of the solution. Check out the website for outreach tools, how-to guides, and many other resources to learn more and get started.

Rain gardens, green roofs, tree plantings, and permeable pavements are examples of some of the practices used to soak up the rain. Often called green infrastructure, these practices rely on soil, plants and natural processes such as infiltration, evaporation, and transpiration to mimic the natural water cycle and manage rain water. Green infrastructure is a cost-effective and resilient approach to managing stormwater that can bring many social, economic, public health, and environmental benefits to communities.