

Acting on Laudato Si:



Putting Pope Francis's Environmental Encyclical Into Action

Track PHX1601

1.5 hours

Provider Name: Conference for Catholic Facility
Management (“CCFM”)

Provider Number: G460



Course Title: Acting on Laudato Si: Putting Pope
Francis’s Climate Change Encyclical Into Action

Course Number: PHX1601

Speakers: CCFM Energy & Environment Committee

April 28, 2016



Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

The Catholic Church is one of the largest facilities owners in North America. Pope Francis's Climate Change Encyclical tells us that we have a responsibility to administer and maintain our facilities in a way that demonstrates our commitment to energy and water efficiency, so that we may leave a better world to future generations. This session will identify and explore the different ways in which Catholic facilities managers can reduce energy and water use thereby saving money, as well as following the Encyclical. The Conference for Catholic Facility Management ("CCFM") – Energy and Environmental Committee will provide information to get Churches started saving water, energy and money, or to help Churches continue efficiency efforts they've already begun.

Learning Objectives

At the end of the this course, participants will be able to:

1. Understand the need for energy and water conservation and be familiar with terms associated with both, using examples and/or case studies.
2. Determine the first step in conservation for their parish (i.e., building assessment, benchmarking, etc.) and identify the resources to help, using examples and/or case studies.
3. Understand benchmarking water and energy use, using the United States Environmental Protection Agency's ("EPA") Portfolio Manager and the Catholic Climate Covenant and United States Green Building Council's ("USGBC") online resources.
4. Propose conservation and environmental programs locally that support Laudato Si but that can also create immediate financial benefits for participating religious organizations, using examples and/or case studies.

Role of Energy and Environment Committee

Mission statement– To provide resources for CCFM Members seeking information on Energy and the Environment that enable them to be better Stewards of Creation and provide healthier and higher performing buildings.

- ▶ Educate on the theology of and the need for Conservation.
 - Laudato Si and Catholic Social Teaching
 - Energy savings and stewards of the Earth
- ▶ Communicate examples of successes.
 - Inspire other parishes by example
- ▶ Describe the programs available to help promote and make feasible Conservation efforts.
 - Identify by region
 - Web page with links
- ▶ Provide CCFM members general information resources.
 - Includes printable handouts for distribution to parishioners
 - i.e. tip sheets for conserving water or how to set up a green team
- ▶ Educate on and guide creation of benchmarking facilities.

Membership of EEC

- ▶ Chair
 - CCFM board member(s)
- ▶ Decision makers
 - Catholic CCFM committee members
- ▶ Advisory
 - Not For Profits (USEPA, USGBC, CCC)
- ▶ Technical experts (support)
 - Trade allies



Encyclical Overview

- ▶ Laudato Si = Praise be to you
 - From St. Francis prayer

- ▶ More than just about the environment
 - Our relationship with God and with all of humanity.
 - The way we treat and relate with all peoples, currently and in the future, is intimately tied to how we treat the natural world and the resources of our world.

POPE FRANCIS ON CARE FOR OUR COMMON HOME

- ▶ Integral Ecology: Everything Is Connected

Encyclical Overview

▶ Ecological Conversion—A Change of Heart

▶ Why

- Chapters 1–4
 - What Is Happening To Our Common Home
 - The Gospel of Creation
 - The Human Roots of the Ecological Crisis
 - Integral Ecology

▶ How

- Chapters 5–6
 - Lines of Approach and Action
 - Ecological Education and Spirituality

Seminar Focus



Lines of Approach and Action

- ▶ Engage in more sober lifestyles;
- ▶ Reduce energy consumption;
- ▶ Improve efficiency;
- ▶ Utilize forms of energy with lower impact on the environment



Lines of Approach and Action

Collective Actions

- ▶ Do more than avoid harmful practices.
- ▶ Use creativity to promote best practices and new solutions.
 - Energy efficiency and renewable energy, but also:





Archbishop Schnurr's Press Conference on *Laudato Si'*



Acting on Pope Francis' Call: Divestment and Investment in Care for Our Common Home

FAITHFUL SUSTAINABILITY

Best Practices for Facilities and Homes in the Archdiocese of Cincinnati

ATTENTION: CHURCH & SCHOOL FACILITY MANAGERS, GROUNDS KEEPERS/MAINTENANCE PERSONNEL, FINANCE LEADERS, PASTORAL COUNCIL MEMBERS, AND HOMEOWNERS:
Responding to Pope Francis' recent encyclical on care for creation, *Laudato Si'*...

How can we, as a community of faith, more fully answer the call for sustainability?

Through a morning of workshops and discussions with local experts, we'll explore how we as the local Church can reduce our environmental footprint, lower utility bills, nurture nature, and increase our commitment to energy efficiency in our homes, schools, and parishes.

Don't miss it!

- Join one of two tracks: facility or household best practices.
- All are welcome, but space is limited to the first 50 participants in each track who register. Sign up now!
- Topics include energy efficiency, financing options, native plants and planting with energy conservation in mind, recycling, composting, and more!
- **The program is only \$5.** It includes light breakfast and lunch – both **locally sourced!**
- Registration deadline: Nov. 4.



Learn more and register online:
www.CatholicCincinnati.org/SocialAction

Or contact:
Catholic Social Action at
csa@catholiccincinnati.org
(513) 421-5151 ext. 2660

Saturday, November 7, 2015
8:30am: Light Breakfast and Registration
9-1pm: Program (Lunch Included)
St. Joseph Church & the Petersburg Parishes

Parish Life Center—101 West Pearl Street, Wapahoneta, Ohio 45895 (Enter parking lot from Blackhoof St.)

Sharing Stories

- ▶ What projects/activities have you done that exemplify Lines of Approach and Action?



CASE STUDIES



Catholics Building Green



Arch. of Cincinnati 9th Floor Central Office

- ▶ uPVC windows with triple low e film
 - ▶ Foam and batt wall insulation to 6"
 - ▶ Foam ceiling insulation
 - ▶ New HVAC and lighting control system
 - ▶ Occupancy control sensors
 - ▶ LED lighting throughout
 - ▶ Low flow water fixtures
 - ▶ Dyson hand dryers
 - ▶ Daylight usage throughout
 - ▶ Reclaimed and locally sourced wood paneling
- 30% Energy Savings Expected



St. Thomas of Canterbury Chicago, IL

- ▶ Energy Assessment performed first
- ▶ Aerators and sprayers free
- ▶ Assessment Recommendations:
 - Boiler tune-ups
 - Convection oven
 - Pipe insulation
 - Steam traps
 - Thermostats
- ▶ Best Project: steam traps
 - \$2,500 cost w/ \$2,500 rebate
 - \$3,600 savings per year for other upgrades



Energy Jumpstart Opportunities

The following natural gas-saving equipment was installed in your facility at no charge:

Equipment Type	Annual Energy Savings Per Unit (Therms)	Quantity	Estimated Annual Energy Cost Savings
Aerator - Bathroom - Chicago	5.56	4	\$22.24
Pre Rinse Sprayer	109.64	1	\$109.64
Total:	115.20	5	\$131.88

Natural Gas Savings Opportunities

Additional improvements that can help your facility save natural gas are listed along with available rebates and estimated savings below. Please contact your Energy Advisor for further assistance in moving forward with any of these recommendations.

Equipment Type	Annual Energy Savings Per Unit (Therms)	Quantity	Total Rebates Available	Estimated Annual Energy Cost Savings
Boiler Tune Up (Com)	0.19	600	\$240.00	\$114.00
Boiler Tune Up (Com)	0.19	1674	\$669.60	\$318.06
Energy Star Convection Oven	309.06	2	\$400.00	\$618.12
Pipe Insulation - DHW - Small <=1.25"	2.46	200	\$200.00	\$492.00
Pipe Insulation - Steam - Med 2-5"	13.28	230	\$1380.00	\$3054.40
Pipe Insulation - Steam - Small <2"	5.37	135	\$540.00	\$724.95
Steam Traps - HVAC Repair/Rep - Audit	333.78	11	\$1320.00	\$3671.58
Thermostat - Programmable	101.57	2	\$100.00	\$203.14
Total:	1433.32	2905	\$8749.60	\$14535.61

St. Monica/St. George Cincinnati, OH

- ▶ 34 kW solar install and whole campus LED retrofit
- ▶ \$163K
- ▶ 7 year payback
- ▶ LED energy reduction
 - 27%
- ▶ Solar energy reduction
 - 33%
- ▶ Total energy reduction
 - 60%



Project Highlights

- Upgraded all lights to efficient, daylight colored lamps
- Replaced aging, inefficient boiler
- Cleaned and repaired Unit Ventilators
- Installed Occupancy Sensors throughout building

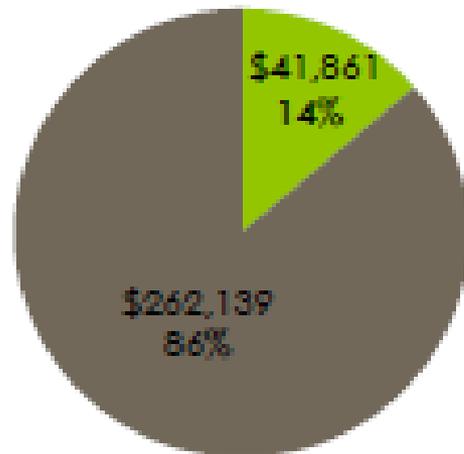


Carroll High School Dayton, OH

Making It Possible

\$304,000 Total Cost

■ Rebate ■ Out of Pocket



Results

- 21% electricity use reduction
- 18% natural gas reduction
- \$28,000/yr energy savings
- 9.4 yr simple payback with rebates vs. 10.8 yr without rebates (Not incl. O&M)
- Annual loan payments less than annual energy savings
- Rebates equivalent to almost 2 years of loan payments

Getting Started

▶ Glossary

- EPA
 - Glossary of energy terms applicable to facilities within Portfolio Manager
 - “Tools and resources” search visible on any page associated with www.energystar.gov
 - For broader environmental terms, one can search at www.epa.gov
- USGBC
 - www.usgbc.org/glossary

▶ Not-for-profit partners

- EPA
- USGBC
- Interfaith Power & Light Companies
- City or municipality
- Partners for Sacred Places (www.sacredplaces.org)

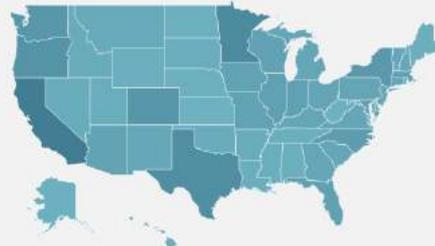
Getting Started



Database of State Incentives for Renewables & Efficiency®

Find Policies & Incentives Near You

Find Policies & Incentives by State



US Territories > DC District of Columbia > Federal >

www.dsireusa.org

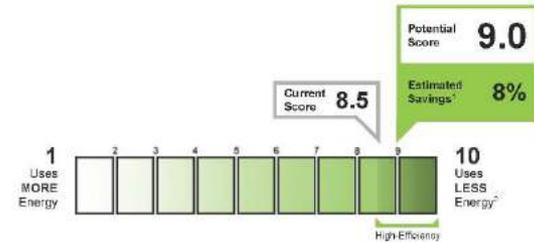
Database of State Incentives for Renewables & Efficiency

BUILDING ENERGY ASSET SCORE OVERALL BUILDING SCORE

1

BUILDING INFORMATION

Emmons Sacred Heart Church Building Type: Religious Building Score Date: 11/24/2015
 Lot 14 Yukon Way Gross Floor Area: 3,168 ft² Building ID #: 2874
 Emmonak, AK 99581 Year Built: 1907 Software Release: 2.0.4



Standard Occupancy and Operating Conditions		Estimated Source Energy Use (kBtu/ft²)		Energy Use Intensity by Fuel Type	
Number of Assumed Occupants	31	Current Building	182	Site Energy Use (kBtu/ft²)	
Hours of Operation	46.0 hrs/wk	Upgraded Building	167	Source Energy Use (kBtu/ft²)	
Cooling Set Point	75° F			Fuel Type (Site EUI, Source EUI)	
Heating Set Point	70° F			Gas (50.9, 53.5)	
Misc. Energy Loads	1.50 W/ft²			Electricity (41.0, 128.0)	
				District Heating (0.0, 0.0)	
				District Cooling (0.0, 0.0)	

The Building Energy Asset Score is a national rating system developed by the U.S. Department of Energy. The Score reflects the energy efficiency of a building based on the building's structure, heating, cooling, ventilation, and hot water systems. The building's Structure and Systems are individually evaluated and ranked. The Upgrade Opportunities page provides recommendations for how to improve the building's energy efficiency, increase the building's Asset Score, and save money.

1. Savings reflect the cost to the owner to invest in energy efficiency upgrades, but do not include the cost of all the efficiency improvements listed in the Upgrade Opportunities page. Actual savings will depend on a variety of factors such as building conditions.

2. A score of 10 represents lower energy use and up-to-date energy efficiency technologies. A score of 8.5 represents a high-energy building that uses roughly 37% less energy than a building up to it in the ASHRAE 90.1-2010 energy code.

3. The report is based on data reported to the Internet, <http://www.dsireusa.org> and is not a representative score.



<http://energy.gov/eere/buildings/building-energy-asset-score>

The U.S. Department of Energy's Building Energy Asset Score (Asset Score) is a national standardized tool for assessing the physical and structural energy efficiency of commercial and multifamily residential buildings. The Asset Score generates a simple energy efficiency rating that enables comparison among buildings, and identifies opportunities to invest in energy efficiency upgrades. It is available for voluntary use and is 100% free to use.

Energy Efficiency Funding Possibilities



▶ Utility Programs

- Rebates, Grants & other Incentives
 - Check www.dsireusa.org for you community
- Subsidized Equipment Loans
 - National Bank of AZ in conjunction with the local utilities offers EE term loans up to \$50K for 3 Yrs @ 3.9%
- On-Bill Financing (OBF)
 - The Newman Center and others in Fresno, CA are using PG&E OBF for LED Lighting Retrofits. Terms are 0% interest for up to 5 Yrs

▶ PACE

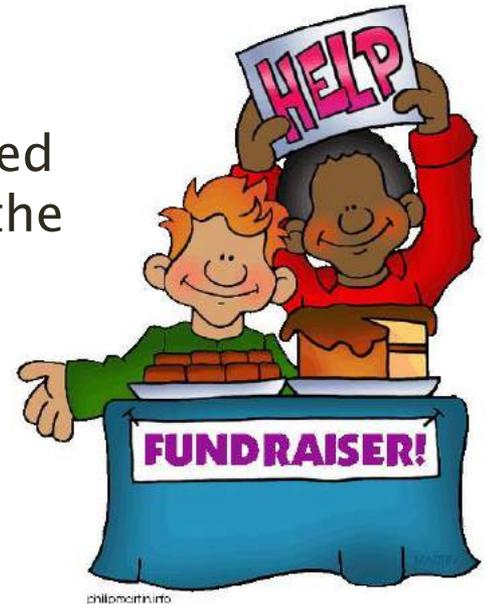
Renewable Energy Funding Possibilities

- ▶ Local/State/Utility incentives
 - Still exist for some communities
- ▶ The ‘Church Member LLC’ Lease
 - Taps into the tax liabilities and qualifying income of your High-Net-Worth parishioners and their businesses to fund the installation
- ▶ PPA financing
- ▶ Many energy efficiency methods as well



Other Funding Possibilities

- ▶ Optimize Rate Plans and Net Metering riders
- ▶ Capital Campaigns/Fundraisers (grassroots or professionally assisted)
- ▶ Legacy Gifts or Estates
 - Can be used to jumpstart a project or positioned to fund a future balloon payment.....they are “the gift that keeps on giving”
- ▶ Diocese Lending varies by Diocese



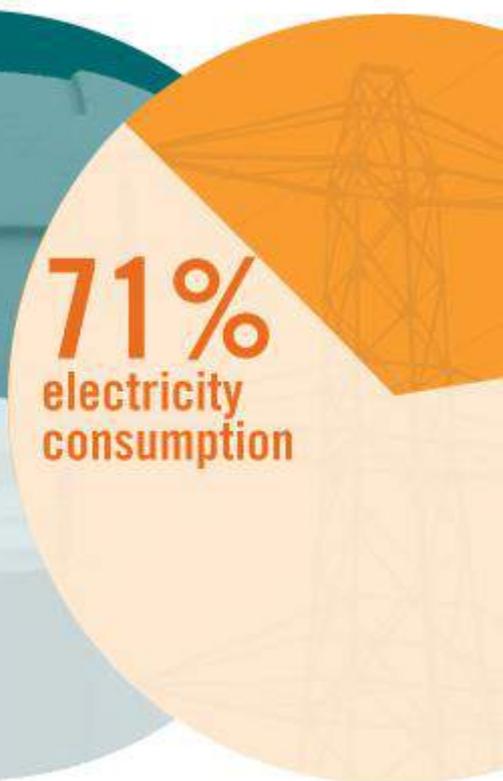
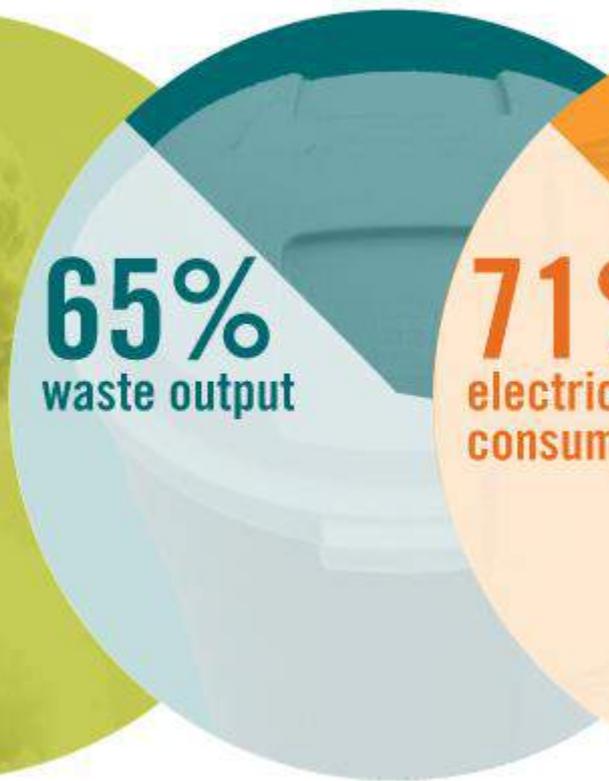
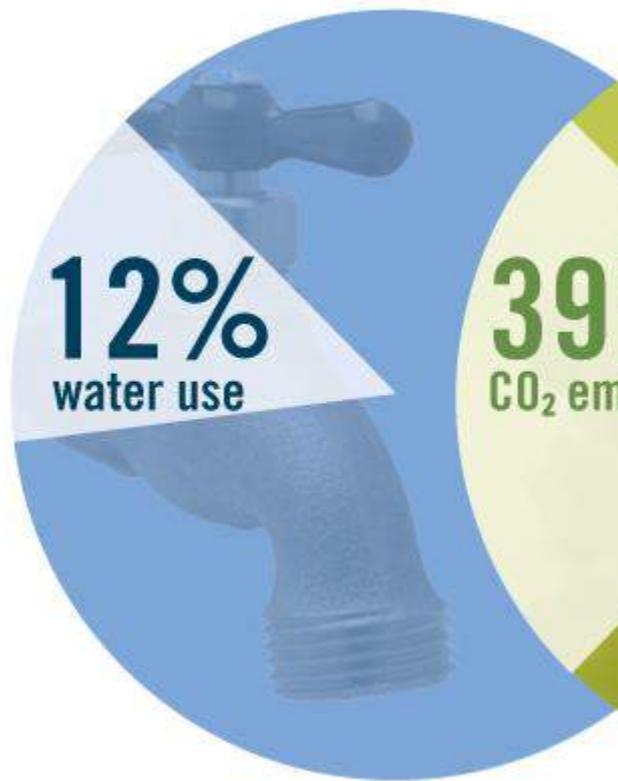


Why do our buildings matter?



90%

of our time indoors...

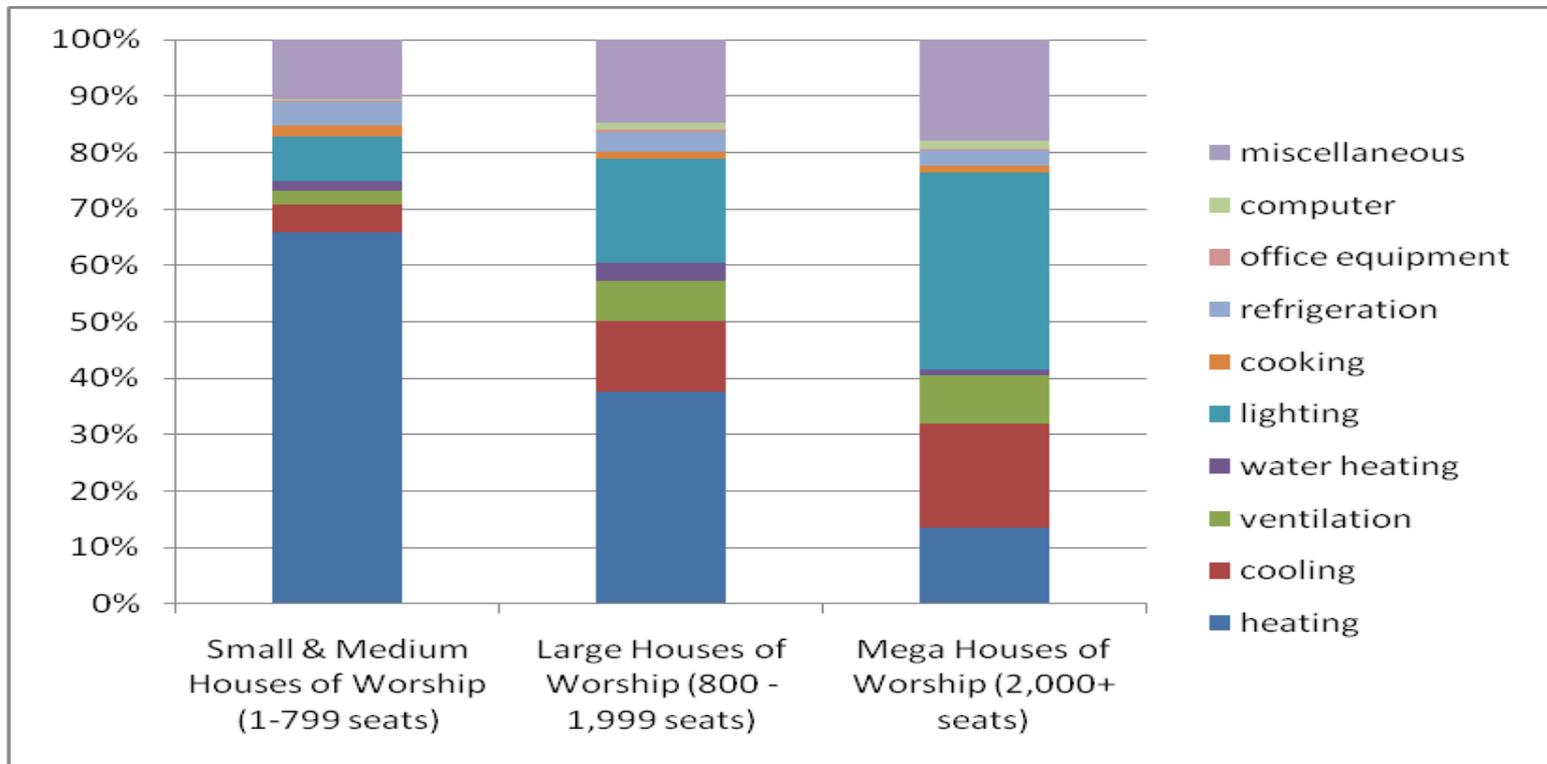




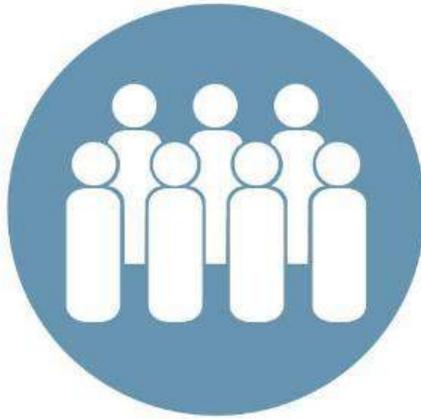
Houses of Worship

Average Energy Consumption

U.S. Energy Information Administration, 2003 Commercial Buildings Energy Consumption Survey (CBECS).







STEWARDSHIP





Reduce contribution to **global climate change**



Enhance individual **human health**



Protect and restore **water resources**



Protect and enhance **biodiversity and ecosystem services**



Promote **sustainable and regenerative** material cycles



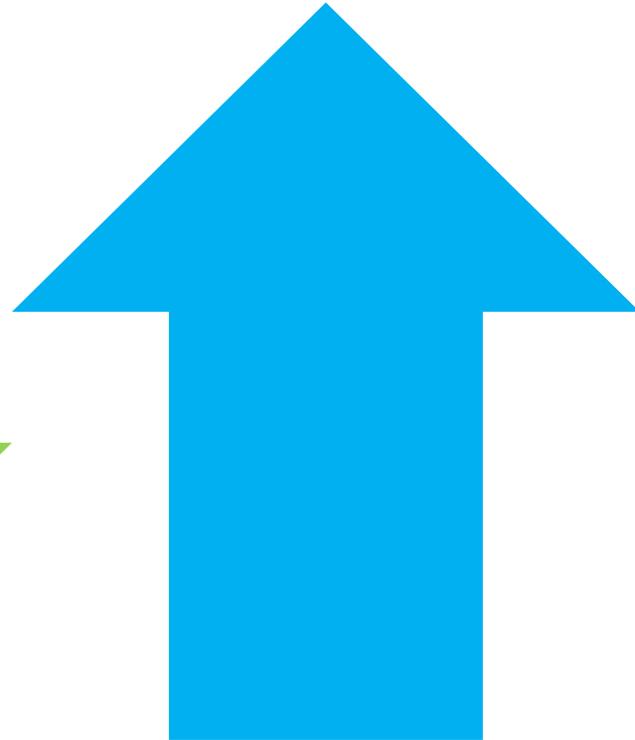
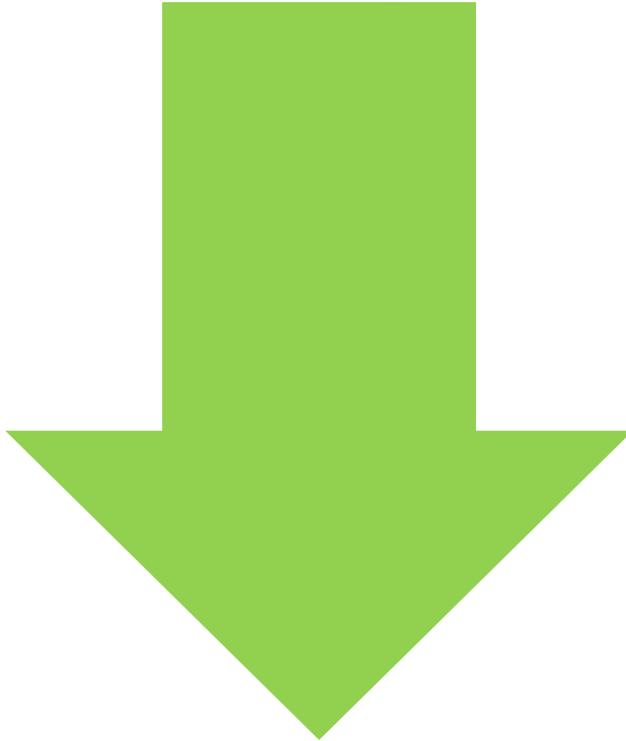
Build a **green economy**



Enhance **community quality of life**



costs of operation



**ability to meet
mission**

*\$20 billion can be saved annually by 10%
energy efficiency improvements.*

U.S. Department of Energy



- ✓ Reduce Energy Demand
- ✓ Use Energy Efficiently
- ✓ Measure & Track Energy Use
- ✓ Use Clean Energy



- ✓ Efficient Flush & Flow Fixtures
- ✓ Outdoor Water Use
- ✓ Submeters & tracking
- ✓ Non potable water use



Local & Online education

LEED Professionals

Paid from Savings Guide

ADVANCE

Technical guides

Case studies

usgbc.org



BECOME A LEED PROFESSIONAL

Learn and grow your green building knowledge anytime, anywhere. Visit USGBC.org/education for more information.



Like a nutrition label, LEED shows the ingredients that go into a green building, home, or neighborhood.

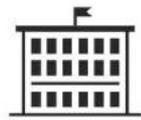


The **LEED® Dynamic Plaque™** is a building performance monitoring and scoring platform for LEED-certified projects, providing annual LEED recertification and global benchmarking. The plaque displays a LEED performance score, which reflects the measured performance of the building across five categories: energy, water, waste, transportation and human experience. The LEED Dynamic Plaque makes the invisible actionable and offers a means for interaction with the building on multiple levels.





the path to leadership



Community centers



Faith-based organizations



Schools



Cultural institutions



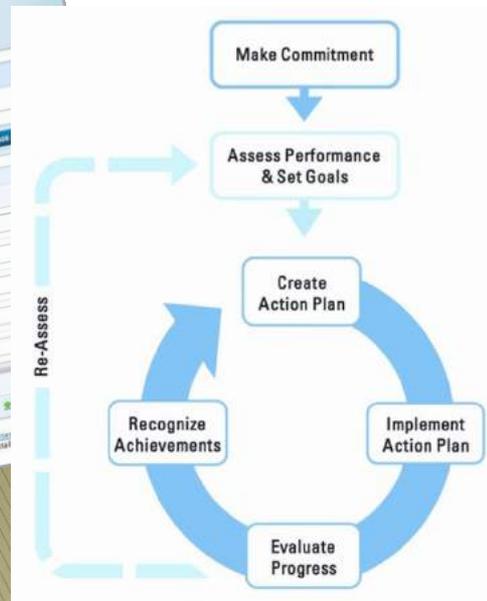
Affordable and existing homes



Neighborhoods

ENERGY STAR for Congregations

Powerful tools for financial and environmental stewardship



Top 5 reasons why energy efficiency is key to your stewardship goals

1. Money saved can be redirected to your unfunded priorities
2. Extends useful lifespan of facility and equipment
3. Increases asset value of your property
4. Improves overall comfort, functionality and appearance of your facilities
5. Key action step for *Laudato Si*; engages the support of clergy, congregation members, especially youth groups



Need more?....5 more reasons

1. Demonstrates financial stewardship is “practiced as well as preached” - enhances the credibility of a capital campaign
2. Improves credit-worthiness of your congregation for financing new construction or remodeling
3. Serves as model financial stewardship for the homes and businesses of congregation members
4. Conserves natural resources for future generations
5. Protects human life and health by reducing energy-related pollution





UNITED STATES CONFERENCE OF CATHOLIC BISHOPS

- ▶ **Multi-year ENERGY STAR certified** - saving about \$41,000 annually from baseline
 - 2,839 light fixtures relamped/reballasted to T8's
 - Replaced all incandescent bulbs with CFLs or LED's
 - Upgraded all emergency exit signs to LED's
 - Installed lighting motion sensors in all offices, hallways, and conference rooms
 - All appliances are ENERGY STAR certified
 - Installed VFD (Variable Frequency Drive) on cooling towers, air-handling units
 - Installed sink auto-faucets, auto-flush toilets and urinals



What can YOU do?

- 1) Come to the Saturday morning “Benchmarking Jam”
- 2) Download the ENERGY STAR Action Workbook at www.energystar.gov/congregations

Existing buildings Commercial new construction Industrial energy management Small business **Congregations**

IN THIS SECTION

- Improve the Energy and Water Performance of your Congregation
- Track your Energy and Water Use
- Learn from others' Successes
- External Faith-Based Environmental Stewardship Organizations

ENERGY STAR for Congregations



Did you know that most congregations can cut energy costs by up to 30% by investing strategically in efficient equipment, facility upgrades and maintenance? Congregations decide to focus on energy efficiency for a variety of reasons, including lowering utility bills, reducing energy consumption, and reducing pollution that is harmful to human health and the environment. Virtually all faith traditions teach stewardship of the earth and of its life-supporting natural resources.

RESOURCES FOR CONGREGATIONS

Use these resources as planning guides for implementing cost-effective energy improvement projects for your house of worship.

- [The ENERGY STAR Action Workbook for Congregations](#)
- [Workbook Summary](#)
- [Workbook Appendices](#)
- [Click here for more Tools and Resources](#)

Discover the new and improved Portfolio Manager today.

SIGN UP

ENERGY STAR Action Workbook for Congregations

The Action Workbook is a step by step guide to help houses of worship manage their energy use. In addition to the main text, there is a large appendices guide with worksheets and other technical information.

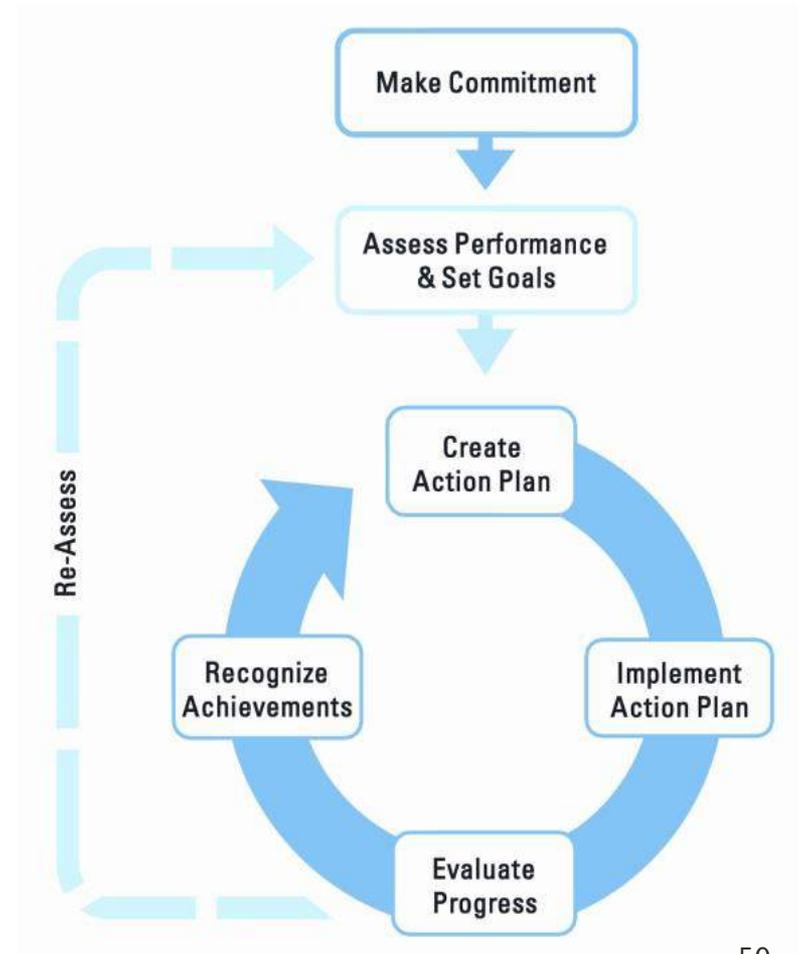
7 Steps to Energy Management:

- Step 1: Make a Commitment to Saving Energy
- Step 2: Assess Performance
- Step 3: Set Goals
- Step 4: Create an Action Plan
- Step 5: Implement the Action Plan
- Step 6: Evaluate Progress
- Step 7: Recognize Achievements



The ENERGY STAR Guidelines for Energy Management

- A proven path to stronger stewardship
- Best practices of ENERGY STAR partners
- Adapt the Guidelines to your approach to energy performance



Step 1: Make a commitment to saving energy

- Become an ENERGY STAR partner by joining at www.energystar.gov/JoinBuildings
- Information, tools, training and tech support to gain the understanding of your clergy, staff, and governing board
- Motivate your congregation
- Strengthen your stewardship team

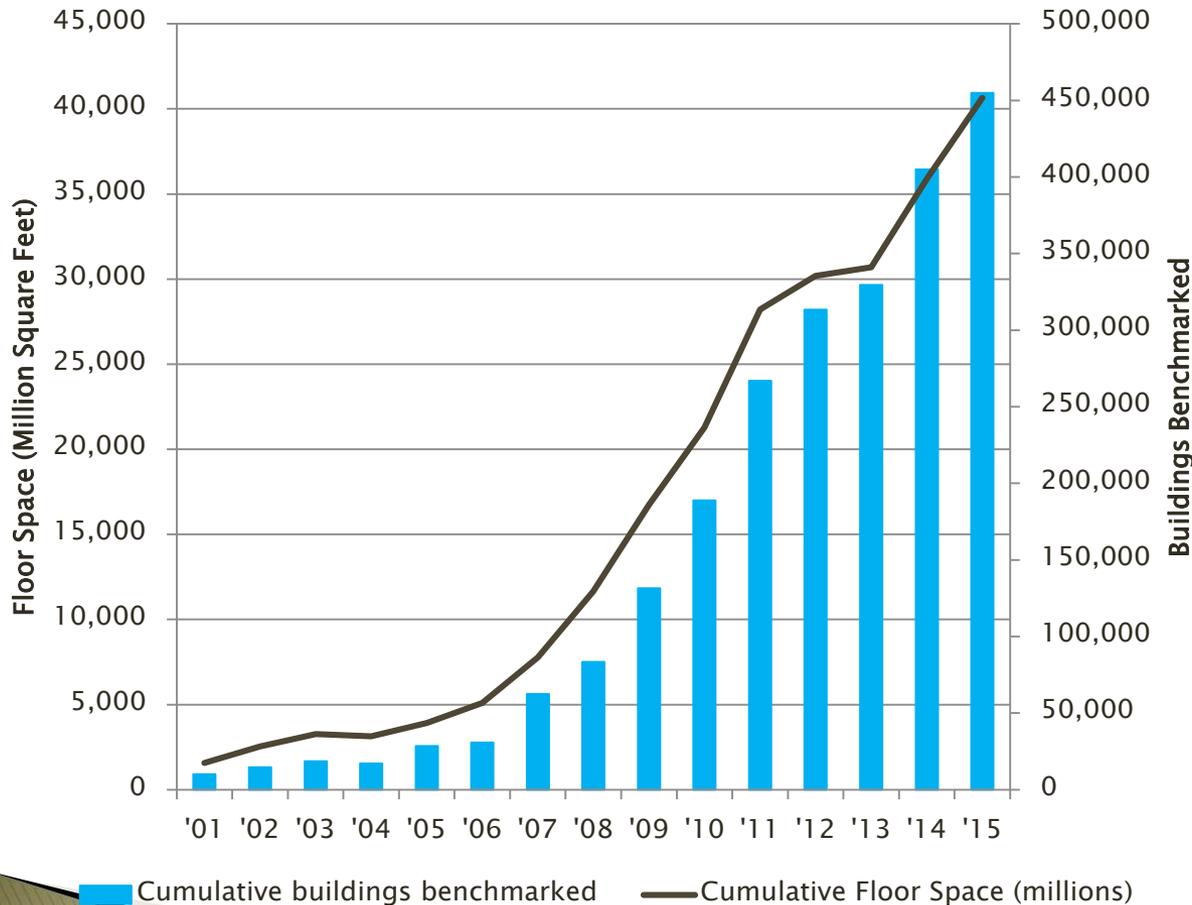
Step 2: Assess performance by benchmarking your energy use

- You can't manage what you don't measure.
- A baseline of your current energy and water use helps you plan, manage and track improvement projects toward success
- The ENERGY STAR Portfolio Manager tool is America's leading benchmarking platform. Compare your property to others nationwide with the 1 – 100 ENERGY STAR score.
- Free, online at www.energystar.gov/benchmark

What is Portfolio Manager?

- **EPA's ENERGY STAR Portfolio Manager will help you:**
 - Assess your property's energy and water consumption
 - Track changes over time for energy, water, greenhouse gas emissions, costs
 - Track green power purchases
 - Share/report data with others as needed
 - Create custom reports
 - Apply for ENERGY STAR certification
- **Metric Calculator – Key performance metrics for your strategic management plan**
 - Energy consumption (source, site, weather-normalized)
 - Water consumption (indoor, outdoor)
 - Greenhouse gas emissions (indirect, direct, total, avoided)
 - ENERGY STAR 1-to-100 score (for many building types)

ENERGY STAR is the national standard



More than 450,000 facilities benchmarked in Portfolio Manager.

That's **40%** of U.S. commercial building space

Step 3: Set goals

- ▶ Portfolio Manager's goal setting feature helps you evaluate priorities and set goals for costs, energy and water use. Think about:
 - Project scope (all or part of the property)
 - Timeline (short and long term)
 - Link to broader organizational strategic goals
- ▶ Prioritize goals for feasibility in your ideal timeframe.

Step 4: Create an action plan

- ▶ Walk through your building to identify areas for action
- ▶ Before an audit review ENERGY STAR ***Sure Energy Savers*** for no-cost and low-no cost actions for:
 - 1) Lighting
 - 2) HVAC
 - 3) Windows, Doors and Walls
 - 4) Office Equipment
 - 5) Kitchen and Food Service Equipment
 - 6) Water
- ▶ Then, consider an energy audit
- ▶ Consider financial options for your project

Step 5: Implement the action plan

- ▶ **Create a Communication Plan** to keep everyone updated on accomplishments, project status and work remaining
- ▶ **Manage the Project—Implement the Upgrades**
 - Whether staff, volunteers or contractors, you want to track:
 - Who is responsible for each of the project upgrade
 - Where (and how many places) the project upgrades are implemented
 - Baseline energy use/costs compared to improvements, savings
 - Track budgeted financial resources and spending
 - Estimated and actual project completion dates

Step 6: Evaluate progress

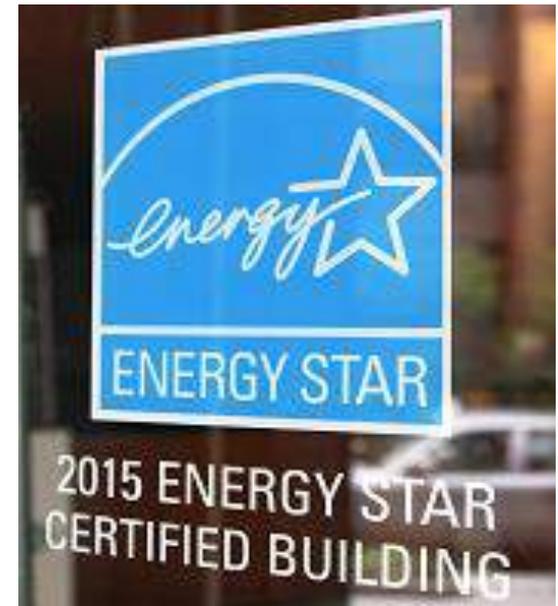
- ▶ **Manage Maintenance and Track Progress:**
Make sure the project upgrades continue to benefit the property for their entire useful life
- ▶ **Measure and Verify Savings:** Portfolio Manager can run different savings data based on the project information entered: dollars, energy and water saved, reduced greenhouse gas emissions

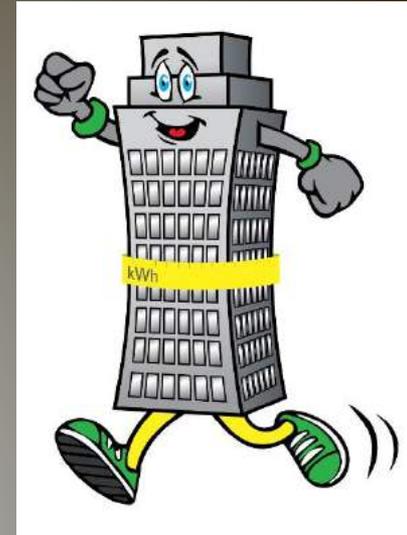
Step 7: Recognize achievements

- ▶ **Recognize and Share Your Success Story within and outside your Congregation**
 - Important to recognize the hard work and dedication of your team and everyone who helped
 - Consider sharing your story with other parishes, CCFM and ENERGY STAR. Your example can help inspired and educate others to multiply the stewardship benefits

Step 7: Recognize achievements

- ▶ Earn the ENERGY STAR for existing buildings
- ▶ A score of 75 or above (1 – 100 scale) in Portfolio Manager is eligible
 - New Construction can earn ***Designed to Earn the ENERGY STAR***
 - Participate in friendly challenges and competitions





Take 90 days to whip your buildings into fighting shape!

- Buildings nationwide compete to reduce energy and water use.
- Register up to 5 buildings to keep your efforts focused
- Recognition is based on percentage improvement in building energy or water use
- ENERGY STAR is providing new toolkits to help you engage occupants
- Learn more and follow along at www.energystar.gov/battleofthebuildings

Key 2016 Dates

- Register: May 17 – July 17
- Compete: September 1 – November 30
- Winners announced Winter 2017

Recognition

Top performers for energy and water efficiency improvement recognized by building category

Resources for more information

Join ENERGY STAR at no cost or obligation at www.energystar.gov/JoinBuildings

For help, visit energystar.gov/BuildingsHelp

Portfolio Manager fact sheets, recorded and live training at www.energystar.gov/Buildings/Training

Action Workbook and success stories at www.energystar.gov/Congregations

SACRED HEART PARISH CLEAN ENERGY RETROFIT





BUILDING ENVELOPE PHASE ONE



24% Reduction in Water Consumption in first year (269,506 gallons)

2015 Annual Savings

- \$9,000 Water
- \$10,500 Gas



SOLAR PANELS PHASE TWO



160 kW of Solar Power
Generation for the
Parish Campus

Producing 270,000
kWh of Electricity Per
Year

\$36,000 savings in the
first year alone.



LIGHTING PHASE THREE



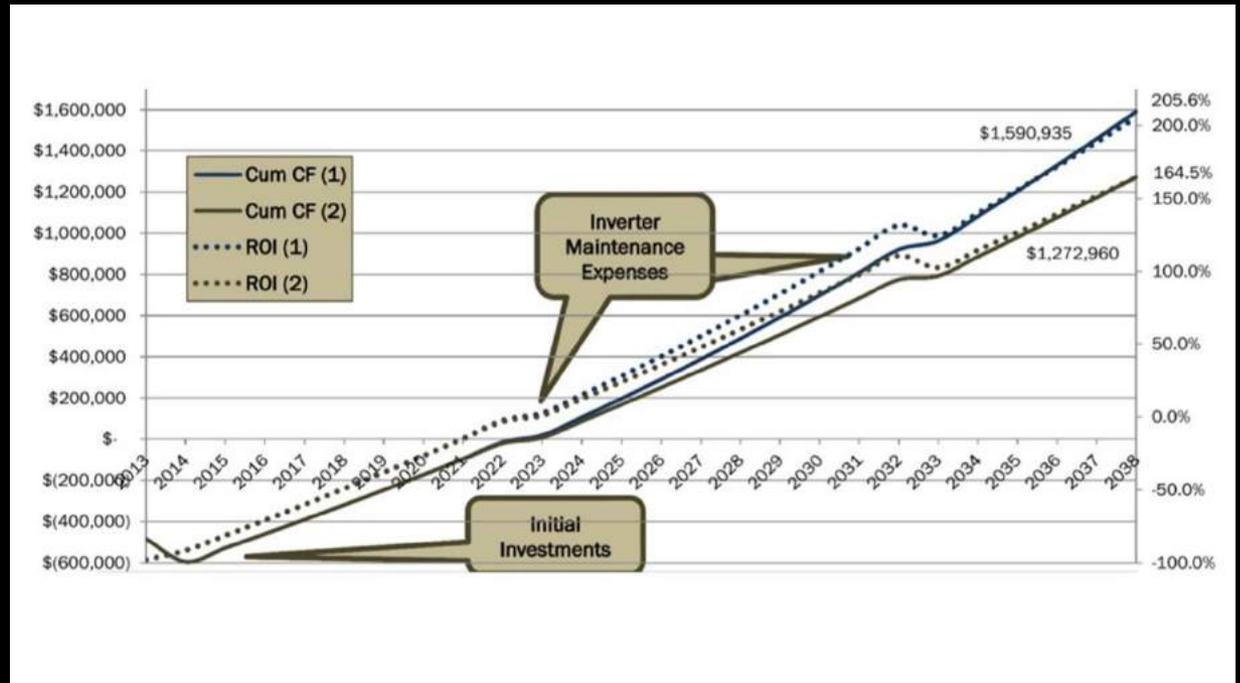
750 LED Lights Installed
Throughout Parish (97%)

Changes Have Resulted In
Savings of **Over \$9,500**



ROI

FINANCIALS



This concludes The American Institute of Architects Continuing Education Systems Course

At this time the course participants are free to ask questions.



Conference for Catholic
Facility Management (“CCFM”)

Andy Guljas
317.525.7176

Energy & Environment Committee

