

# Join the Energy Conservation Crusade:

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## Lessons Learned from Implementing Laudato Si

Track MIA1703

1.5 hours

Conference for Catholic  
Facility Management (“CCFM”)  
G460



Course Title  
MIA1703

CCFM Energy & Environment Committee  
April 24, 2017



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## Conference for Catholic Facility Management (“CCFM”)



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# Course Description

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Last year, the Conference for Catholic Facility Management (“CCFM”) – Energy and Environment Committee (“EEC”) presented an introduction to Pope Francis’s Environmental Encyclical as it relates to CCFM members. This session will explore no-cost and low-cost steps members can take to reduce energy use and options for measuring, tracking and reporting on energy use reduction, as well as assistance with education to illustrate the correlation between energy conservation and Laudato Si’. Also hear case studies and successes from CCFM members who have engaged in conservation and efficiency projects

# Learning Objectives

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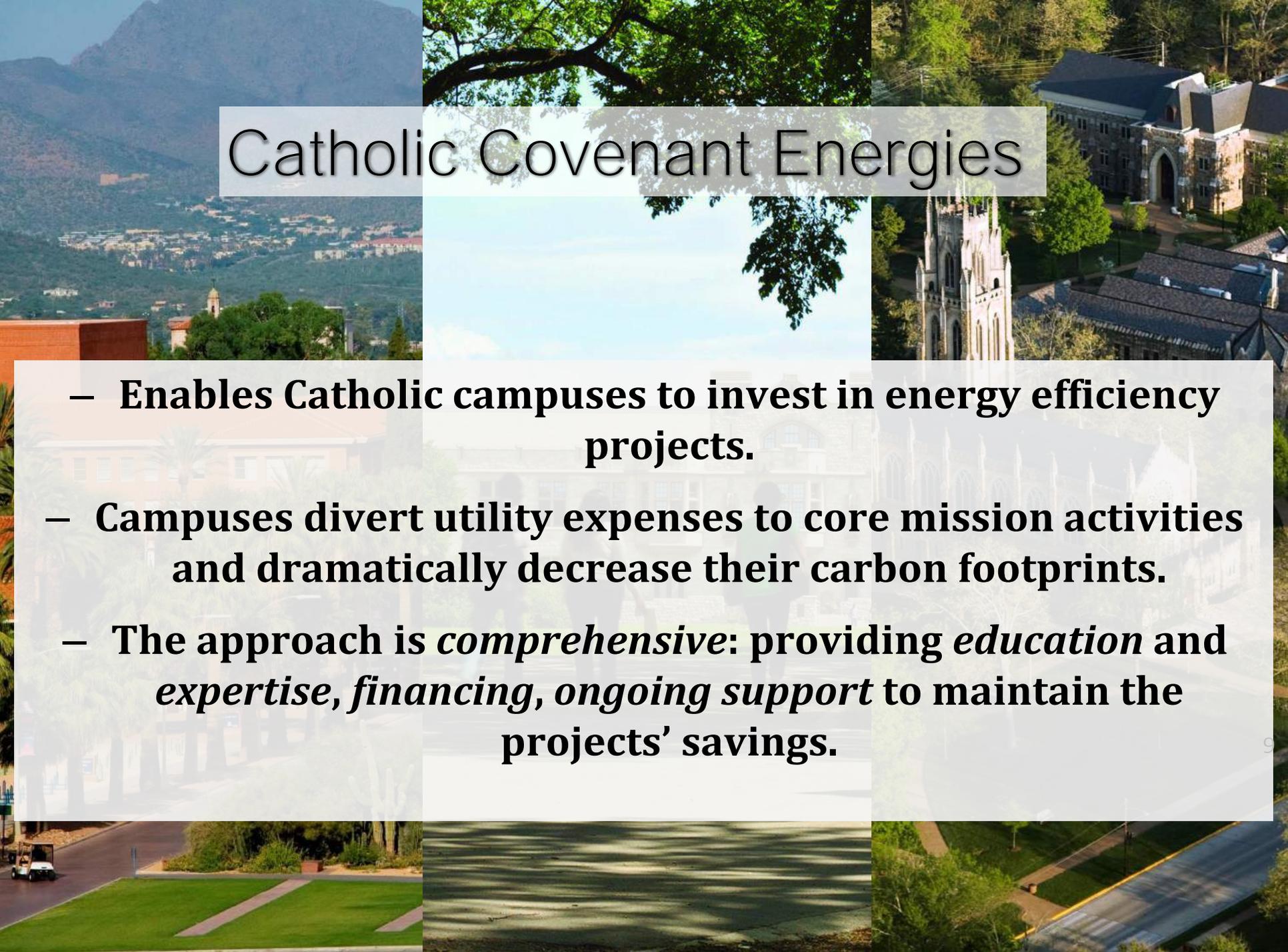
At the end of the this course, participants will be able to:

1. At the end of the program, participants will better understand how to implement and publicize the energy reduction strategies and lessons learned from Pope Francis's second environmental encyclical – *Laudato Si'*, as a way to sustain our “Common Home” (the Earth), limit environmental degradation and man-made global warming, and promote the overall health of the planet's inhabitants, using examples and case studies.
2. At the end of the program, participants will be able to understand specific actions they can take to increase energy efficiency and alleviate other environmental concerns within their facilities by tracking and reducing energy use, using examples and case studies.
3. At the end of the program, participants will be able to identify the stakeholders at their organization that will support energy efficiency and assist solving other environmental concerns within their facilities, using examples and case studies.
4. At the end of the program, participants will be able to translate energy efficiency efforts into educational language that supports *Laudato Si'* (Pope Francis's second environmental encyclical), and promote the physical, mental and social wellbeing of their building users, using examples and case studies.



# Catholic Covenant Energies



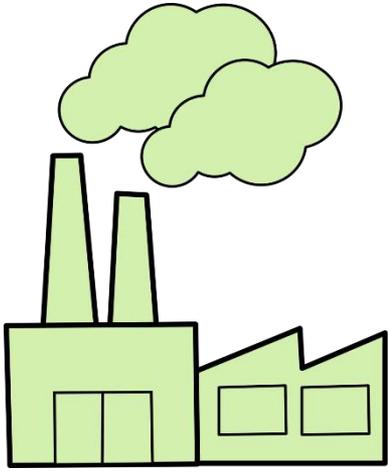


# Catholic Covenant Energies

- **Enables Catholic campuses to invest in energy efficiency projects.**
- **Campuses divert utility expenses to core mission activities and dramatically decrease their carbon footprints.**
- **The approach is *comprehensive*: providing *education and expertise, financing, ongoing support* to maintain the projects' savings.**

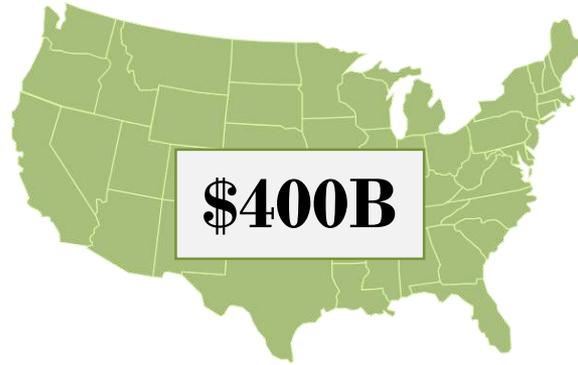


# The Problem



**Energy waste is rampant, and has harmful financial & environmental consequences**

Buildings in the U.S. waste \$200B per year and emit more than 2,600 million metric tons of CO<sub>2</sub>. This is equivalent to the emissions from 292 billion gallons of gasoline.



**We have a large opportunity to invest in energy efficiency**

There are \$400B in net present value (NPV) positive projects that could cut emissions from buildings by 23%.



**Unfortunately, many organizations can't access the financing to implement energy efficiency in their buildings**

Despite the opportunity, two-thirds of projects under \$1M don't have access to capital.



# US Catholic Church

*73 million Catholics (23% of the U.S. population)*

*18,000 parishes; 70,000 Catholic-owned buildings*

*573 Catholic hospitals treated 84.7 million patients in 2005*

*6,511 elementary schools and 1,354 high schools, with over 2.5 million students enrolled*

*244 Catholic colleges and universities with nearly 800,000 students*





# The Opportunity

**70,000 Catholic-owned buildings reducing energy by 25% equals:**

- a cost savings of **\$630 billion**
- the equivalent of **8.7 billion** tons of coal.

**CCE will also help pursue additional demand-reduction programs:**

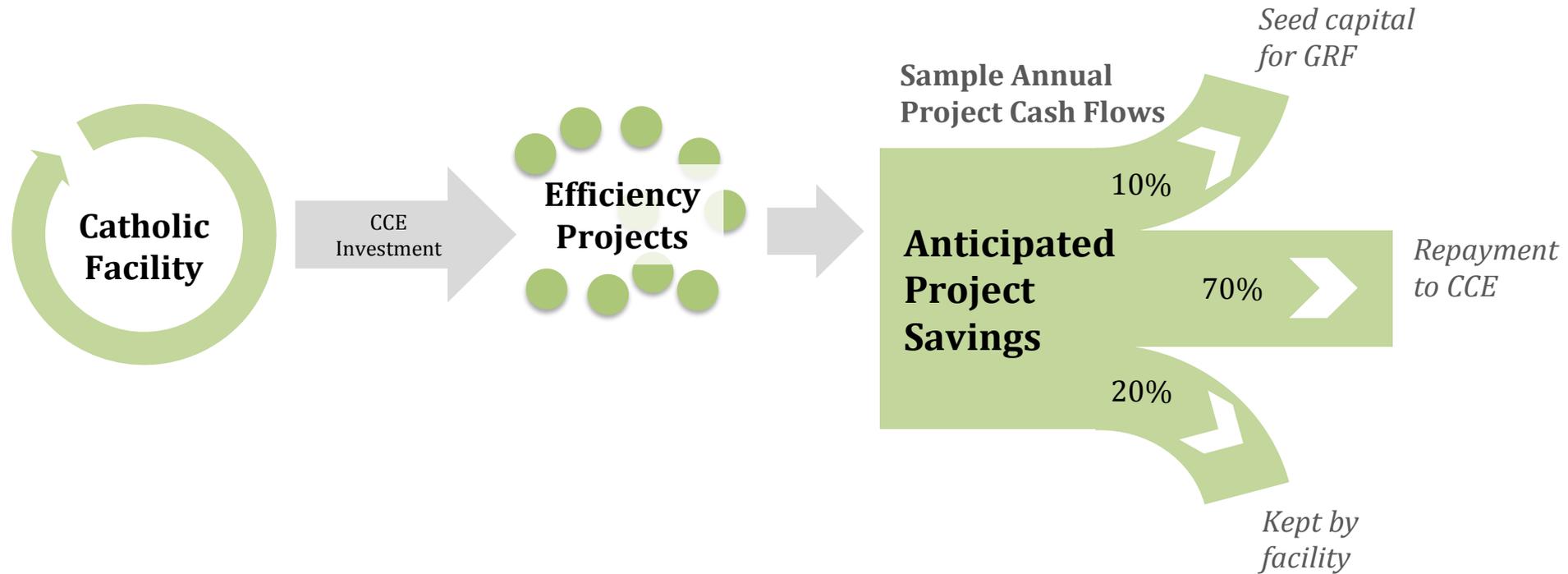
- renewable energy,
- supply-side strategies

CCE will encouraging a Green Revolving Fund,

- To continue to invest in energy use reduction strategies

**CCE also has a suite of educational programs**

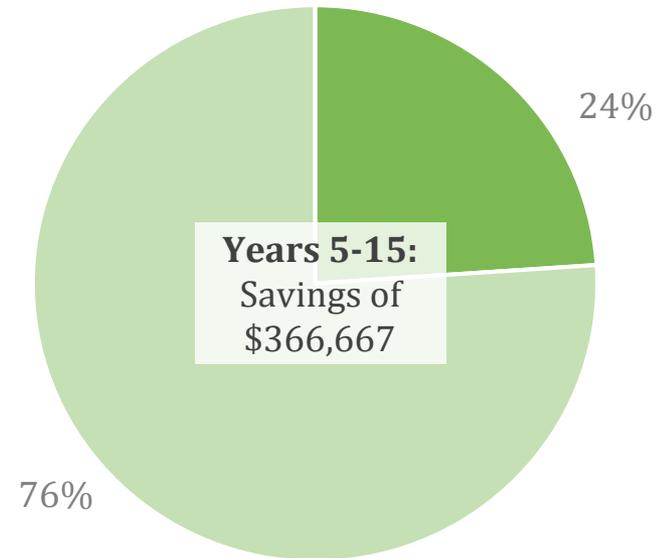
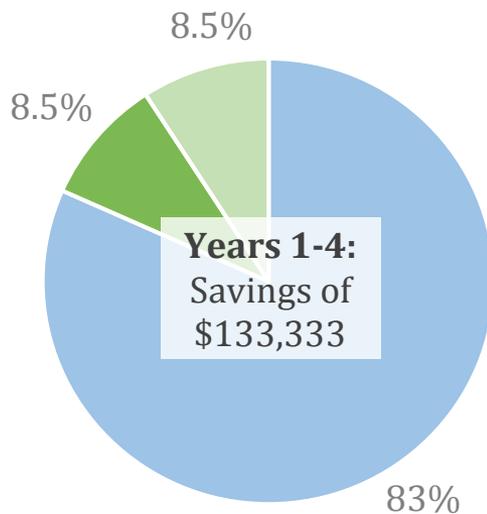
# CCE – Advancing the GRF Concept



Institutions use CCE investment to pay for their efficiency projects. The savings these projects generate are used to **a) loan repayment, b) seed the facility's own GRF, and c) pay for other organizational needs and programs.**

# Repayment Example

Example: CCE makes a loan for a \$100,000 project at 5% annual interest over a four-year term. The project generates \$33,333/year in savings for 15 years.



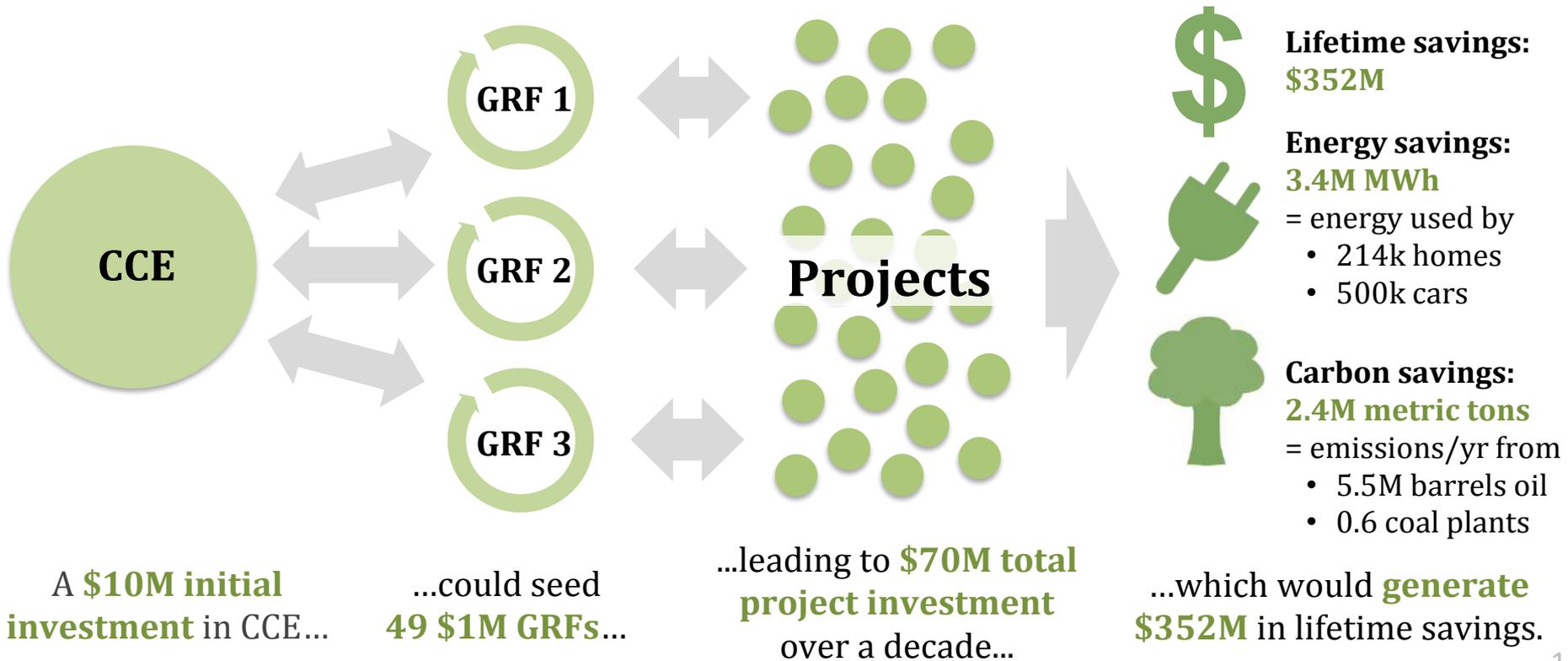
**During the loan:** The institution repays the CCE loan with interest. The remaining savings are split between seeding the institution's GRF and being retained by institution for other uses.

**After the loan:** Once the loan is repaid, the institution keeps all savings and splits them between the GRF and other uses. Once 100% of the original loan amount seeds the institution's new GRF (in this example \$100,000), the remaining savings are free for facility to use.

# Impact Potential

CCE helps institutions seed their own GRFs, enabling ongoing investment in energy efficiency long after the loan is repaid, and increasing the leverage of CCE capital.

Financial modeling shows that CCE will have a magnification factor of about 7x over 10 years. Specifically:

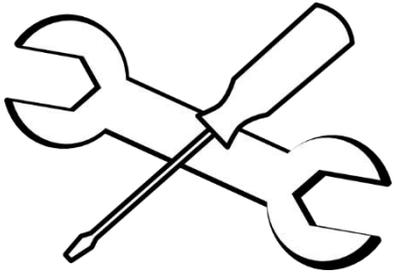


# Competitor Landscape



## Bank Loans

Often involves long turnaround times for approval, high interest rates, and unfavorable balance sheet and collateral impact. Also unavailable to many institutions.



## Energy Service Companies (ESCOs)

Guaranteed-minimum savings approach not a good fit for many institutions. The ESCO model typically employs long contract durations, and requires most of the savings achieved to be paid to the provider.



## Other Financing Options

Equipment leasing companies and other financing solutions often have a higher cost of capital, requiring interest rates that put loans out of reach for many institutions.

# Sample Project in Cincinnati

## Description: Lighting upgrade – T8 to LED

Total Investment: \$29,778

Estimated Rebate: \$2,136

Adjusted Investment: \$27,642

Annual Energy & Maintenance Savings: \$9,050

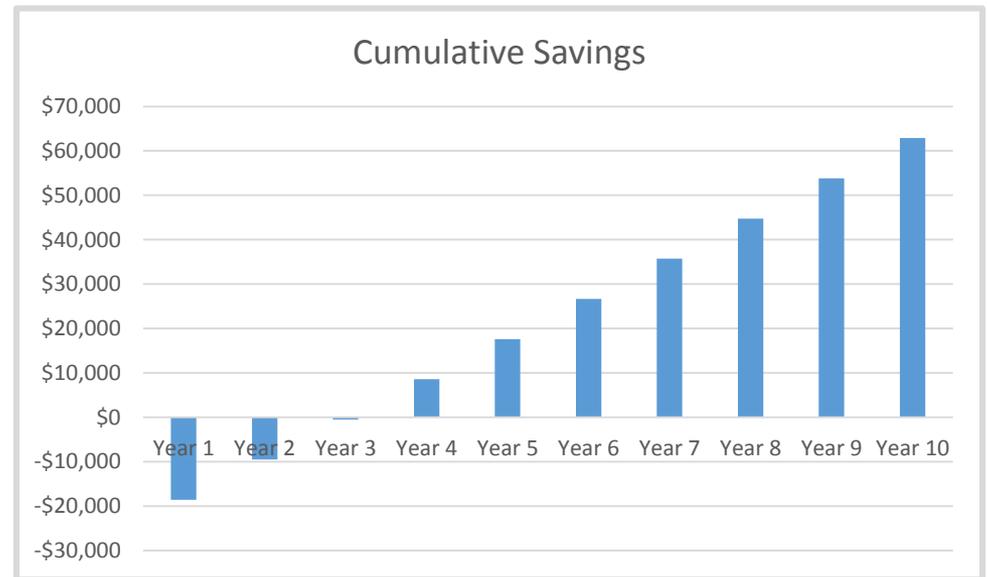
Payback: 36 months

Monthly cost for postponing the lighting upgrade: \$754

### Project Energy Savings

#### Equivalent To:

- 3,700 gallons of gas
- 79,300 car miles driven
- 35,200 pounds of coal
- 850 trees planted



# Management Team



**Dan Misleh**  
**Executive Director,**  
**Catholic Climate Covenant**

CCC is the only Catholic organization in the US focused on the nexus between the Catholic faith and climate change.

Instrumental in U.S. rollout of 2015 encyclical letter on ecology by Pope Francis.

Winner of the Catholic “Harry A. Fagan Award” for his unique contributions made to the achievement of the Catholic vision of social justice in the national or international community.



**Dan Last**  
**CCE Chief Operating Officer**

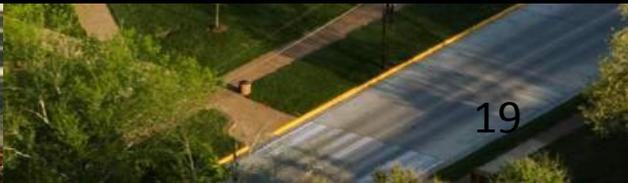
More than seven years’ experience in energy efficiency & finance. Managed a \$3M GRF for large Maryland healthcare system.

Directed Education Practice for DC-based consulting firm overseeing facility efficiency investments for education and other clients. MBA from CU, Boulder & Master of Education from Boston College.



*A great cultural, spiritual and educational challenge stands before us, and it will demand that we set out on the long path of renewal.*

*(LS #202)*

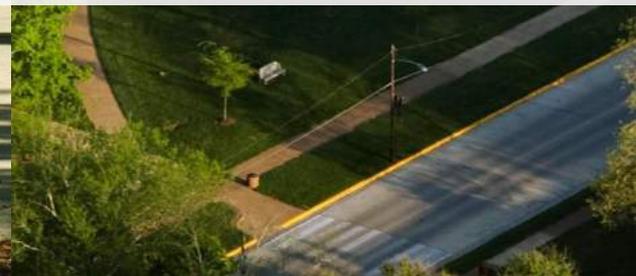




# Conclusion

Catholic facilities have a large, untapped opportunity to cut costs and reduce environmental impact by investing in energy efficiency.

**CCE will catalyze investment in energy reduction strategies where it is most needed by providing capital and other resources to Catholic institutions. Our investments in green revolving funds will continue to have impact for decades to come.**



# Insights from ENERGY STAR



- Municipal Benchmarking Ordinances
- Rebate and Incentive Programs
- Roundtable Preview:
  - Mobile App for Faith Community
  - Portfolio Manager Benchmarking Jam

# 65 Catholic Partners

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- ▶ US Conference of Catholic Bishops
  - 4 years of ENERGY STAR certification at Washington, DC headquarters
- ▶ Archdioceses of Baltimore, Boston, Chicago, Cincinnati, Miami
- ▶ Dioceses of Joliet, Richmond, Rockville Center
- ▶ Catholic Climate Covenant
- ▶ Conference for Catholic Facility Management
- ▶ The Catholic University of America
- ▶ Catholic Health Association of the United States
- ▶ Catholic Charities Facilities Corporation, Cleveland
- ▶ Catholic Charities Houma–Thibodaux, LA
- ▶ Catholic Charities of Los Angeles
- ▶ Catholic Health Initiatives, Denver
- ▶ Dozens of churches, schools, hospitals

# Voluntary, Market-Based Savings

- ▶ Since 1992, saved \$430 billion
  - 3.4 trillion kWh
  - 2.8 billion metric tons emissions

- ▶ \$34 billion in 2016 alone

- ▶ EPA certified products, homes commercial and industrial facilities



## ENERGY STAR® OVERVIEW OF 2015 ACHIEVEMENTS



### AMERICANS MAKE THE SIMPLE CHOICE FOR SAVING ENERGY

Energy efficiency is a proven path to a prosperous 21st century economy built on technologies and practices that save energy, save money, and protect a healthy environment. ENERGY STAR is the flagship example of how sound science and smart policy can leverage the ingenuity of the marketplace to deliver cost-effective energy efficiency solutions. Since the U.S. Environmental Protection Agency (EPA) introduced the ENERGY STAR program more than 20 years ago, the program has become a trusted resource for consumers and businesses across the country.

Today, with brand recognition at more than 85%, ENERGY STAR is a widely recognized symbol for energy efficiency, helping families and businesses save \$430 billion on utility bills, while reducing greenhouse gas (GHG) emissions by 2.7 billion metric tons since 1992 (see Fig. 1). Behind each blue label is a product, building, or home that is independently certified to use less energy and cause fewer of the emissions that contribute to climate change. After years of pioneering energy-efficient solutions, ENERGY STAR has become the simple choice for energy efficiency.

### HIGHLIGHTS FOR 2015

In 2015, millions of consumers and more than 16,000 partners tapped the value of ENERGY STAR and achieved impressive results.

- Americans purchased over 300 million ENERGY STAR certified products across more than 70 product categories for a cumulative total exceeding 5.5 billion products.
- More than 82,000 new homes have earned the ENERGY STAR, bringing the total number of certified new homes to over 1.6 million.
- Among the 450,000 commercial buildings benchmarked using ENERGY STAR Portfolio Manager®, more than 27,000 have earned ENERGY STAR certification.



# Local Benchmarking

- ▶ Growing list of city ordinances for commercial building benchmarking
- ▶ Local details, square footage vary
- ▶ More cities considering a local ordinance
- ▶ Need benchmarking training, tech support?
  - [lawson.jerry@epa.gov](mailto:lawson.jerry@epa.gov)

Jurisdiction	Annual Deadline
DC	1-Apr
San Francisco	1-Apr
Seattle	1-Apr
Portland, OR	22-Apr
Cambridge	1-May
Kansas City	1-May
New York City	1-May
Boston	15-May
Atlanta	1-Jun
Austin	1-Jun
Boulder	1-Jun
Chicago	1-Jun
Denver	1-Jun
Minneapolis	1-Jun
Montgomery Co.	1-Jun
Philadelphia	30-Jun
Evanston	30-Jun
Los Angeles	July 1, 2017, April 1 thereafter
Portland, ME	May 1 (beginning in 2018)
Orlando	May 1 (beginning in 2018)
Pittsburgh	June 1 (beginning in 2018)
Berkeley	July 1 (beginning in 2018)

# Chicago energy benchmarking drives \$17M+ in savings\*

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- ▶ **“Properties that reported consistently for three consecutive years reduced energy use by 4%,** leading to an estimated savings of \$11.6 million per year, according to the report.
  - These buildings also improved their U.S. EPA Energy Star scores by 6.6%.
- ▶ **Properties with two consecutive years of reporting saw a collective energy reduction of 1.9%,** saving an estimated \$6.2 million per year and improving their Energy Star scores by 7.8%, according to the report.”
- ▶ Among the findings from three years of benchmarking: **The city reported that up to 25% of energy in buildings is likely being wasted;**

\*Source: Smart Energy Decisions blog, 1-20-2017, [www.smartenergydecisions.com](http://www.smartenergydecisions.com)

# Local Benchmarking

## Summary of legislation

- Building size
- Requirements
- Public disclosure

## Link to full document

## Download at:

[www.energystar.gov/buildings/tools-and-resources/leverage-energy-star-legislation-and-campaigns](http://www.energystar.gov/buildings/tools-and-resources/leverage-energy-star-legislation-and-campaigns)

### NATIONAL, STATE, AND LOCAL GOVERNMENTS LEVERAGING ENERGY STAR®

The simple choice for energy efficiency.



February 2017

#### LOCAL POLICIES LEVERAGING ENERGY STAR TOOLS

Jurisdiction	Policy	Applies to	Requirements
Minneapolis, MN	<a href="#">Ordinance 47.190</a> February 2013	City buildings more than 25,000 square feet and commercial buildings more than 100,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy and water use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. Benchmarking data will be publicly disclosed for applicable buildings.</li> </ol>
Montgomery County, MD	<a href="#">Bill 2-14</a> April 2014	All county-owned nonresidential buildings, and privately owned nonresidential buildings more than 50,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy use using the ENERGY STAR Portfolio Manager tool.</li> </ol>
New York City, NY	<a href="#">Local Law 84</a> December 2009	City buildings more than 10,000 square feet and private buildings more than 25,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. Benchmarking data will be publicly disclosed for applicable buildings.</li> </ol>
Orlando, FL	<a href="#">Ordinance 2016-64</a> November 2016	City owned buildings more than 10,000 square feet and non-city owned more than 50,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy and water use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. City owned buildings must comply by 2016. Non-city owned buildings must comply by 2017.</li> <li>3. Benchmarking data will be publicly disclosed for applicable buildings via an online database.</li> </ol>
Philadelphia, PA	<a href="#">Bill No. 120428</a> June 2012	Nonresidential buildings more than 25,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy and water use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. The seller or lessor of an eligible building must, upon request, provide prospective purchasers or lessees with a copy of building's most recent Statement of Energy Performance.</li> <li>3. Benchmarking data will be publicly disclosed for applicable buildings.</li> </ol>
Pittsburgh, PA	<a href="#">Building Benchmarking Ordinance</a> October 2016	All city owned buildings, and commercial buildings more than 50,000 square feet.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy and water use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. City owned buildings must comply by 2017 and commercial buildings by 2018.</li> </ol>

# State Agencies and Federal Facilities

- ▶ Many states require their owned/leased facilities be benchmarked
- ▶ All federal owned/leased facilities must be benchmarked

Jurisdiction	Policy	Applies to	Requirements
Federal Agencies	Energy Independence and Security Act (EISA) of 2007, Section 435 December 2007	All federal agencies	<ol style="list-style-type: none"> <li>1. Federal agencies must lease space in buildings that have earned ENERGY STAR Certification no more than 12 months prior to the lease award date.</li> <li>2. If a lessor's building type is not eligible to earn ENERGY STAR Certification, federal tenants will require certain cost effective energy efficiency upgrades to the building.</li> </ol>
	Executive Order 13693: Planning for Federal Sustainability in the Next Decade June 2015	All federal agencies	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. Agencies must meet rigorous sustainability goals in areas including energy and water efficiency improvement, boosting the percentage of their energy use that comes from renewable electric and alternative energy, and broader sustainability assessments.</li> </ol>
	EISA 2007 Section 432 DOE August 2014 Benchmarking Guidance August 2014	All federally owned or leased, metered, covered buildings	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. Benchmarking data will be publicly disclosed via the Department of Energy's Compliance Tracking System.</li> </ol>

STATE POLICIES LEVERAGING ENERGY STAR TOOLS			
Jurisdiction	Policy	Applies to	Requirements
California	Assembly Bill 758 September 2015	Commercial and multifamily buildings more than 50,000 square feet, and all state agencies.	<ol style="list-style-type: none"> <li>1. Applicable buildings must track and report their annual energy use using the ENERGY STAR Portfolio Manager tool.</li> <li>2. State agencies must lease space in buildings that have earned ENERGY STAR Certification, where possible.</li> <li>3. Applicable buildings must reduce energy use by 20 percent by 2030.</li> <li>4. Benchmarking data will be publicly disclosed for applicable buildings via an online database.</li> </ol>
	Assembly Bill 802 September 2015	Utility companies serving California; commercial and multifamily buildings more than 50,000 square feet.	<ol style="list-style-type: none"> <li>1. Utilities must provide applicable buildings with aggregated whole-building energy usage data in a format compatible with the ENERGY STAR Portfolio Manager tool.</li> <li>2. Utilities must be able to provide this data starting on January 1, 2017.</li> </ol>
Connecticut	Senate Bill 1243 June 2011	Utility companies serving Connecticut; all state owned and leased	<ol style="list-style-type: none"> <li>1. Utilities must provide applicable buildings with aggregated whole-building energy usage data in a format compatible with the ENERGY STAR Portfolio Manager tool.</li> </ol>

# ENERGY STAR provides training, tech support

[www.energystar.gov/buildings/training](http://www.energystar.gov/buildings/training)

- Live weekly webinars
- Recorded for 24/7 access
- YouTube videos
- FAQs
- Fact Sheets
- “Ask a question”
- Slide library
- Knowledge base
- Sign up for alerts

The screenshot shows the ENERGY STAR website's 'Buildings & Plants' training section. The header includes the ENERGY STAR logo and navigation links for 'ABOUT ENERGY STAR' and 'PARTNER RESOURCES'. Below the logo is the tagline 'The simple choice for energy efficiency.' and four main categories: 'ENERGY EFFICIENT products', 'ENERGY SAVINGS at home', 'ENERGY EFFICIENT new homes', and 'ENERGY STRATEGIES FOR buildings & plants'. The breadcrumb trail is 'Home » Buildings & Plants » Training'. The 'Buildings & Plants' section has a search bar and links for 'about us', 'press room', 'help desk', and 'portfolio manager login'. A navigation bar includes 'Owners and managers', 'Service providers', 'Program administrators', 'Tenants', 'Tools and Resources', and 'Training'. Below this is a sub-navigation bar with 'Training', 'Slide Library', and 'Knowledgebase'. The main content area is titled 'Training' and features a paragraph: 'EPA offers training on a range of energy efficiency topics — from the ins and outs of ENERGY STAR's Portfolio Manager to guidance on improving the energy performance of your buildings and plants. And that's all with no travel, no lost time out of the office, and no cost. We make it easy to get the information you need, when you need it.' Below this is a call to action: 'Explore the categories below and be sure to check back often for new resources!'. Three categories are listed: 'Training' (Access how-to guides, videos, and webinars about Portfolio Manager and other topics.), 'Slide Library' (Find annotated ENERGY STAR PowerPoint presentations that you can read yourself or deliver to an audience.), and 'Knowledgebase' (Browse through an array of energy efficiency topics for further learning.). On the right side, there is a 'Portfolio Manager' logo and a '“Ask The Expert” webinar' announcement: 'Every Wednesday at 12pm noon ET'. Below this is a 'LIVE AND RECORDED TRAINING SESSIONS' section with a link to view and register for training. At the bottom right, there is an 'ASK A QUESTION' section with a link to 'www.energystar.gov/buildingshelp.' and a 'GET MORE OUT OF ENERGY STAR TRAINING' section.

# Your Local Utility Rebates



- 
- ▶ Rebate dollars are your money; don't "leave it on the table"
    - Check rules before specifying or purchasing major equipment
  
  - ▶ Your diocese/archdiocese is a large, important customer
    - Entitled to consideration and helpful, designated account rep
    - Beyond stated rebates, ask about custom incentives that can achieve the same kWh savings for you and the utility, for non-specified rebates
  
  - ▶ Consider a utility bill audit (electric, gas, water, telecomm)
    - No risk: auditor is paid ONLY AFTER you recover overcharges
  
  - ▶ "Ask Bob"
    - Bob Johnson works for ENERGY STAR; therefore, for YOU
    - Tap his expertise, insights into utility incentives, how to negotiate
    - Contact: [robertdennisjohnson@Hotmail.com](mailto:robertdennisjohnson@Hotmail.com)



# Find Product Rebates

[www.energystar.gov/products](http://www.energystar.gov/products)

The screenshot shows the Energy Star website interface. At the top left is the Energy Star logo. Below it, the tagline reads "The simple choice for energy efficiency." Navigation links include "ENERGY EFFICIENT products", "ENERGY SAVINGS at home", "ENERGY EFFICIENT new homes", and "ENERGY STRATEGIES FOR buildings & plants". A breadcrumb trail shows "Home » Energy Savings At Home". The main heading is "Certified Products" with the subtitle "Your source for energy efficient product information". A navigation bar lists "All Certified Products", "Appliances", "Lighting", "Office Equipment", "Electronics", and "Product Specifications Search". Below this is a large banner with a couple in a kitchen and a child in autumn leaves. The left sidebar lists categories: Appliances, Electronics, Heating & Cooling, Building Products, Office Equipment, and Other. The right sidebar features a "PRODUCT FINDER" search box and a "REBATE FINDER" form with a "SUBMIT" button. A red arrow points from the text on the right to the "REBATE FINDER" form.

ENERGY STAR

The simple choice for energy efficiency.

ENERGY EFFICIENT products   ENERGY SAVINGS at home   ENERGY EFFICIENT new homes   ENERGY STRATEGIES FOR buildings & plants

Home » Energy Savings At Home

Certified Products   Your source for energy efficient product information

All Certified Products   Appliances   Lighting   Office Equipment   Electronics   Product Specifications Search

**YOUR RESOURCE TO:**

- Find ENERGY STAR products
- Learn new ways to save energy
- Find tools to help you save
- Get rebates and offers

**Appliances**

- Air Purifiers (Cleaners)
- Clothes Dryers
- Clothes Washers
- Commercial Clothes Washers
- Dehumidifiers
- Dishwashers
- Freezers
- Refrigerators

**Building Products**

- Residential Windows, Doors and Skylights
- Roof Products
- Seal and Insulate

**Electronics**

- Audio/Video
- Professional Displays
- Set-top Boxes
- Slates and Tablets
- Telephones
- Televisions

**Heating & Cooling**

- Air-Source Heat Pumps
- Boilers
- Central Air Conditioner
- Commercial Boilers
- Ductless Heating & Cooling
- Furnaces

**Office Equipment**

- Computers
- Data Center Storage
- Enterprise Servers
- Imaging Equipment
- Large Network Equipment
- Monitors
- Small Network Equipment
- Uninterruptible Power Supplies
- Voice over Internet Protocol (VoIP) Phones

**Other**

- Electric Vehicle Supply Equipment (EVSE)

**PRODUCT FINDER**

Looking for a specific ENERGY STAR certified product model?

START HERE

**REBATE FINDER**

ENERGY STAR partners sponsor rebates on certified products. Enter a zip code below to find deals near you!

SUBMIT

ENERGY STAR partners sponsor rebates on certified products.

Enter a Zip Code to find deals near you.

# Find State & Utility Incentives

[www.dsireusa.org](http://www.dsireusa.org)

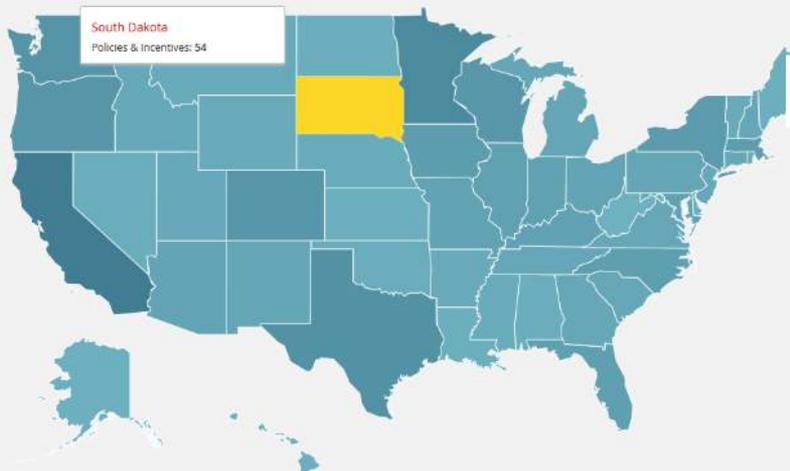
The image shows a screenshot of the DSIRE website. At the top left is the DSIRE logo and the NC Clean Energy Technology Center logo. A navigation menu includes Home, Programs, Resources, Services, Help/Support, About Us, Contact Us, and Legal Notice. Social media icons for Facebook and Twitter are on the right. The main heading reads "Database of State Incentives for Renewables & Efficiency". Below this is a red search bar with the text "Find Policies & Incentives Near You". It contains a "Zip Code" label, a globe icon, a search input field with a red arrow pointing to it, and a "Search" button. Below the search bar is a row of partner logos: Altus Power America, energysage, Green Earth Energy, DSIRE (with "Your Logo Here" text), altE store, and Solar Estimate. Below the logos is the heading "Find Policies & Incentives by State" and a map of the United States with a red arrow pointing to the state of Minnesota. On the right side of the image, there are two text annotations with red arrows: "Enter Zip Code" pointing to the search input field, and "Click State" pointing to the state of Minnesota on the map.

Enter Zip Code

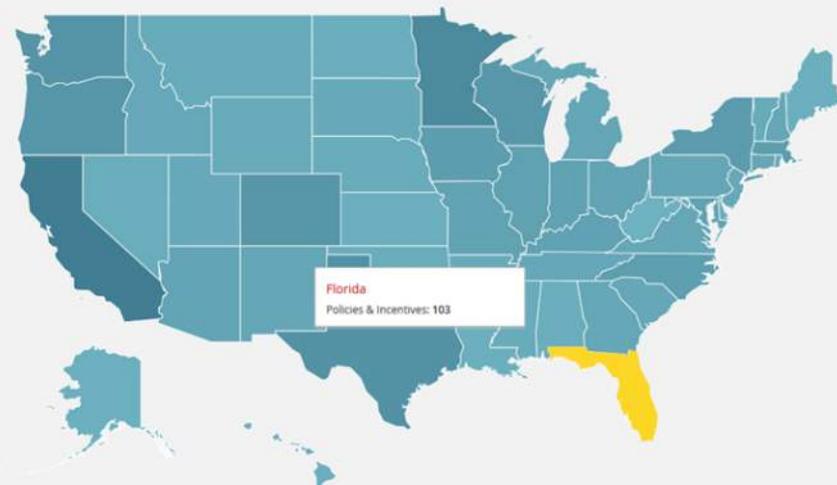
Click State

# Mouse over your state; click for details

## Find Policies & Incentives by State

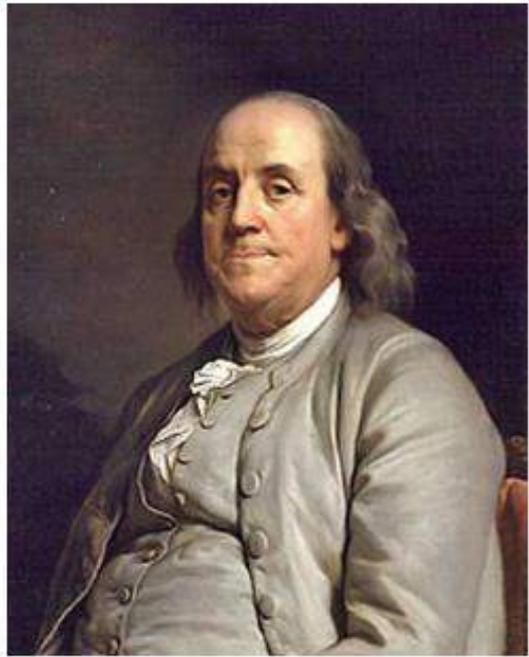


## Find Policies & Incentives by State



# PACE: Property Assessed Clean Energy

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*Philadelphia Created an opt-in fire district in 1736*

- PACE allows property owners to improve efficiency, make repairs with no upfront costs
- PACE uses a financing mechanism that has long funded infrastructure projects like water, sewer, gas, and curb improvements:
  - Benjamin Franklin used this method to fund a Philadelphia volunteer fire department in 1736
- A special assessment is placed on the title of the property and the repayment obligation transfers with the title (along with the savings) to any new ownership
- PACE is available as a voluntary assessment, even to non-profits that don't pay property taxes

# Why PACE for Faith Community?

- Finance infrastructure and energy upgrades without traditional debt
- No out-of-pocket costs, pay for needed building upgrades out of utility savings, preserve budget for mission
- Lower operating expenses, increase net operating income
- Improve comfort and sustainability



# Commercial PACE Programs



[PACE Programs](#)

[Membership](#) ↓

[Resources](#) ↓

[Initiatives](#) ↓

[News & Blog](#)



Active program with funded projects



Launched PACE program



Program in development



PACE-enabled



# Round table: Data Collection Worksheet



[Help](#) | [Login](#)  
Language: [English](#) | [Français](#)

## Portfolio Manager: What data is required to benchmark your property?

You can benchmark almost any type of property in Portfolio Manager! The information required varies depending on the type of property and whether or not the property is eligible for an [ENERGY STAR Score](#).

Pick your country and property type to get started.

Country: \*  [Why is this needed?](#)

Property Type: \*  ✘

Property Type: \*  ✘

[+ Add Another Use Type](#)

You can look up more than one use type if needed. [Learn more about when to use different use types when setting up your property.](#)

[Lookup Required Data](#)

## What Metrics Are Available?

All properties are eligible to receive metrics such as [Source EUI](#) by providing [Gross Floor Area](#) and 12 months of energy usage. The [ENERGY STAR Score](#) is available for specific property types and requires additional information. [Learn more about eligibility for the ENERGY STAR Score.](#)



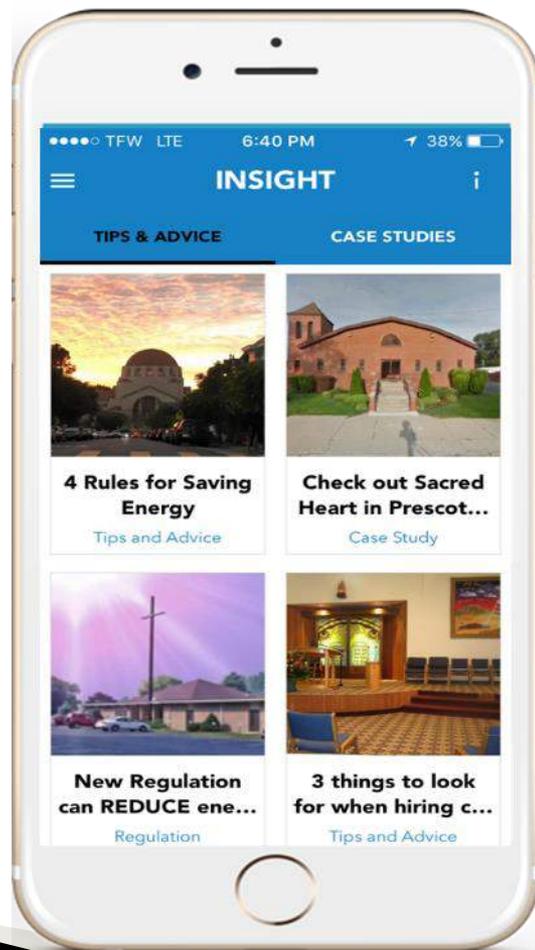
- ▶ Bring your key data and laptop
- ▶ Leave with your Portfolio Manager account set up
- ▶ Leave with tech support contact info
- ▶ Leave with benchmarking insights and resources



[Contact Us](#) | [Privacy Policy](#) | [Browser Requirements](#) | [ENERGY STAR Buildings & Plants Website](#)

# Round Table Preview: Mobile App for Faith Community

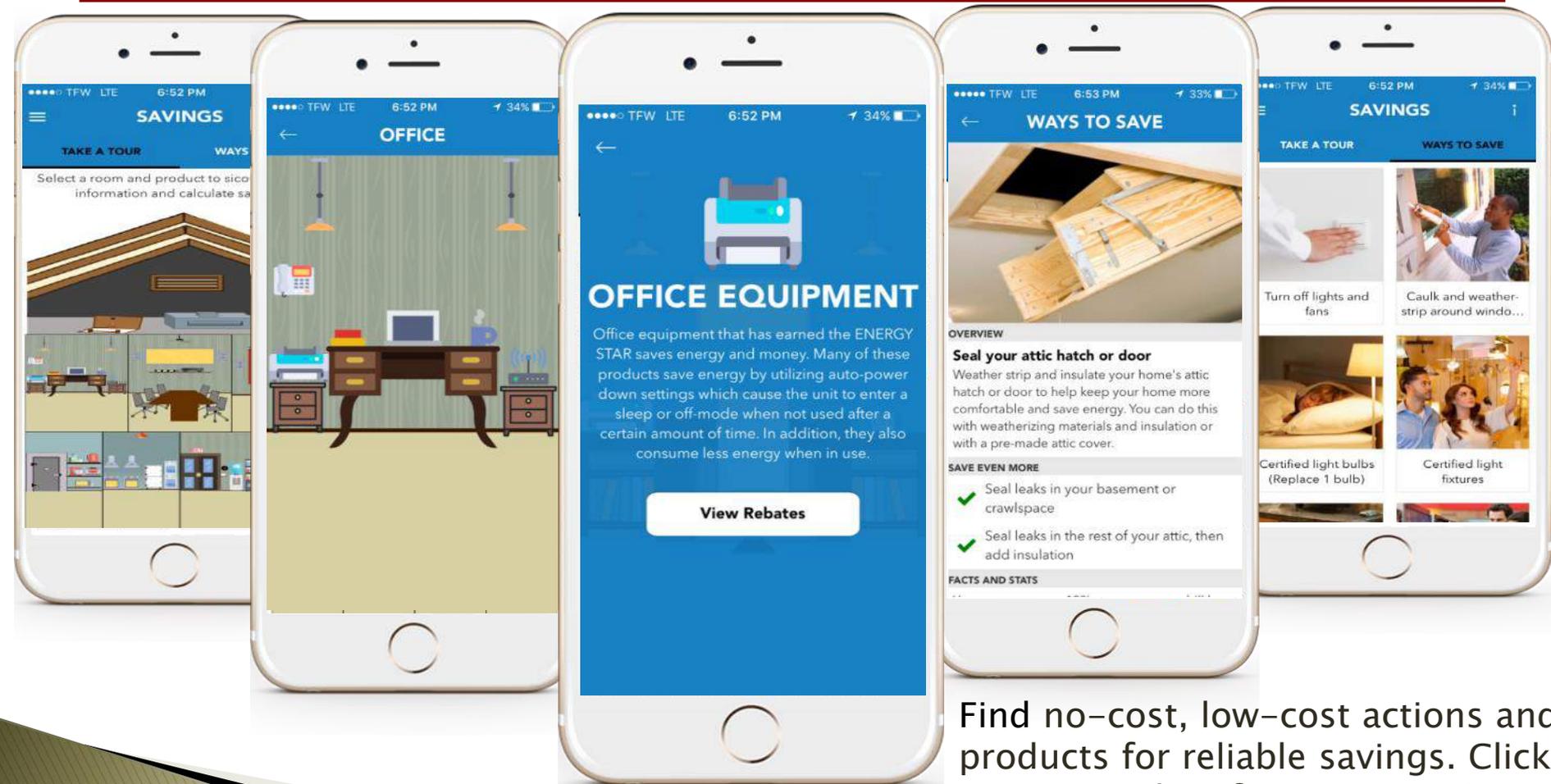
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## INSIGHT

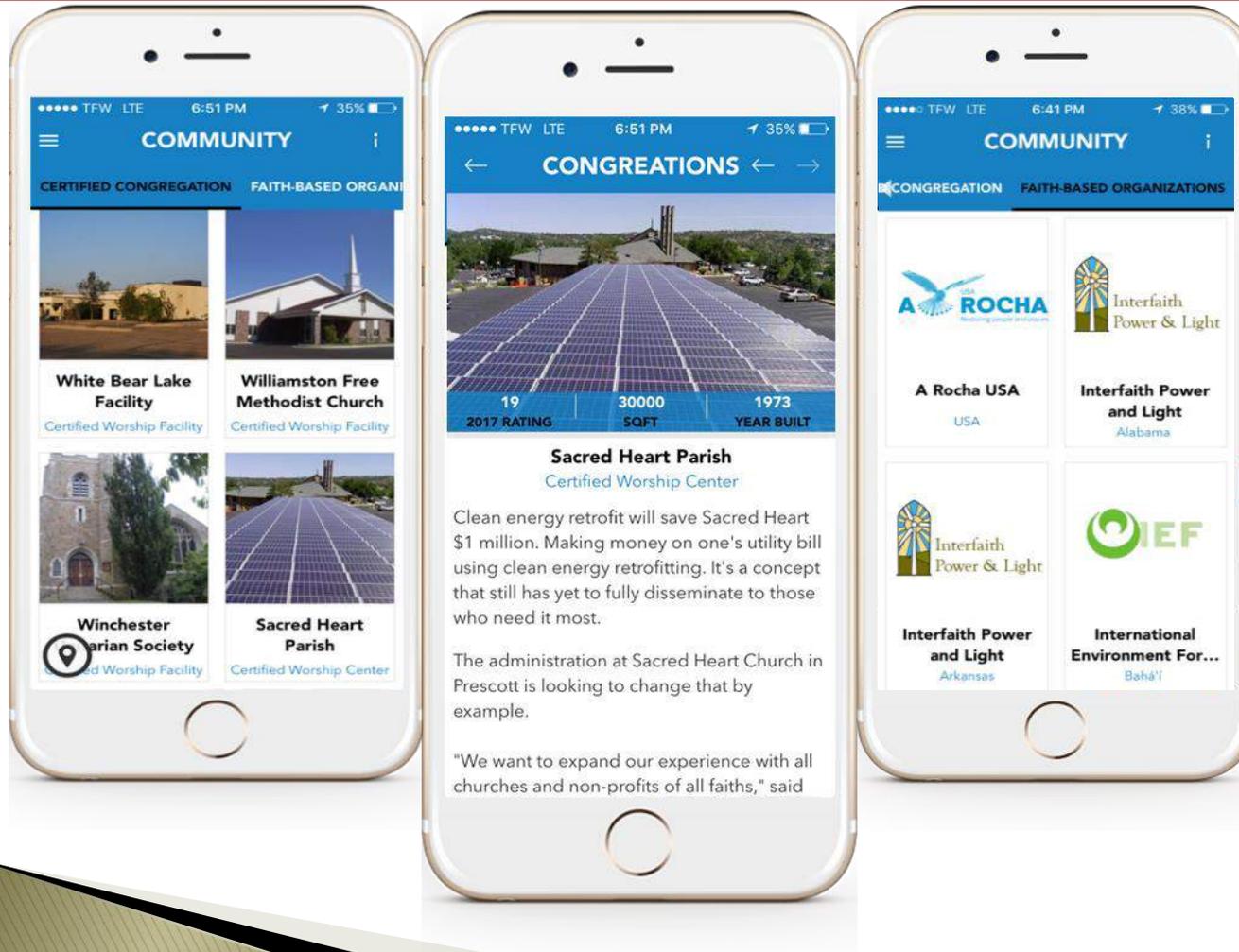
- ▶ Discover the latest announcements, case studies and news for congregations in the app's Insight Section

# SAVINGS TOUR



Find no-cost, low-cost actions and products for reliable savings. Click on any product for specs, savings calculators and more info

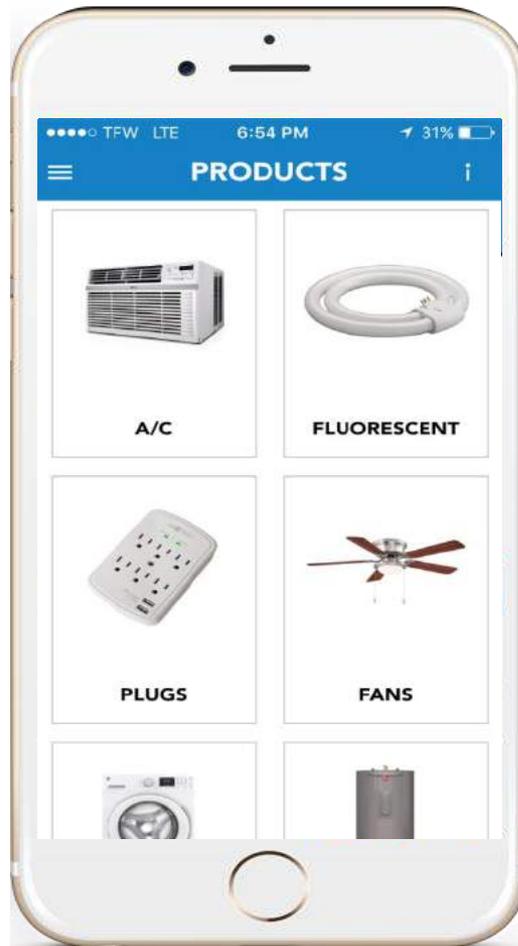
# COMMUNITY



Read about  
ENERGY STAR  
certified  
congregations

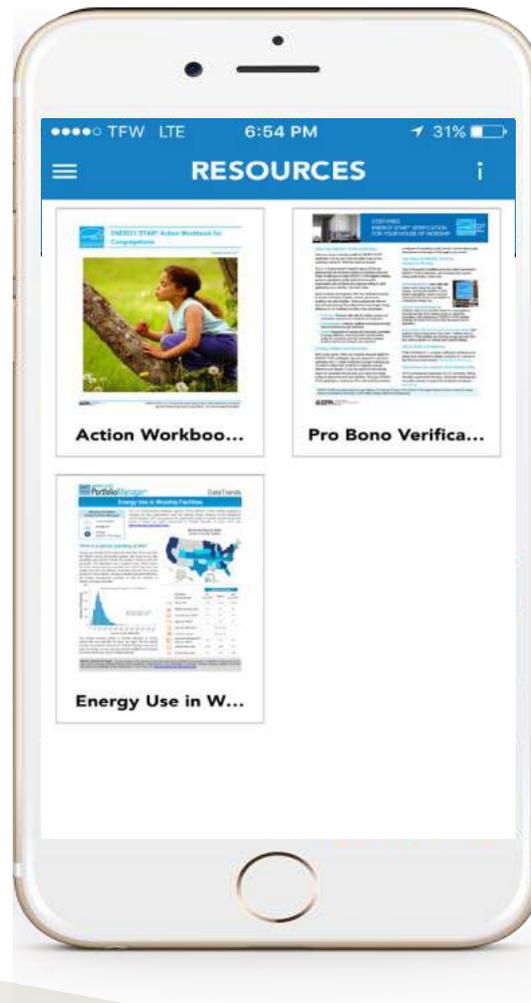
Link to state  
and national  
faith-based  
organizations  
across America

# PRODUCTS



- ▶ Click images for ENERGY STAR certified product information, and where to find retailers who sell them

# RESOURCES



- ▶ Get started today with no-cost, low-cost “how to” action items, checklists and “Sure Savers” in the *ENERGY STAR Action Workbook for Congregations* and other free online information.

# UTILITY REBATE FINDER



- ▶ Search by utility name, state or Zip Code to find financial incentives offered by your utility

# [www.energystar.gov/join/buildings](http://www.energystar.gov/join/buildings)



The simple choice for energy efficiency.

ENERGY EFFICIENT  
products

ENERGY SAVINGS  
at home

ENERGY EFFICIENT  
new homes

ENERGY STRATEGIES FOR  
buildings & plants

ABOUT ENERGY STAR PARTNER RESOURCES



Home » Buildings & Plants » Owners and managers » Congregations

## Buildings & Plants

about us | press room | help desk | portfolio manager logi

Owners and managers

Service providers

Program administrators

Tenants

Tools and Resources

Training

Existing buildings

Commercial new construction

Industrial energy management

Small business

Congregations

Improve the Energy and Water Performance of your Congregation

Track your Energy and Water Use

Learn from others congregations' successes

External Faith-Based Environmental Stewardship Organizations

### JOIN MAILING LIST



Sign up to receive updates from ENERGY STAR BUILDINGS & PLANTS on Portfolio Manager and program news.

## 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.

ENERGY STAR has the tools and resources to help. With free, unbiased information and technical support from ENERGY STAR, your congregation can more easily improve stewardship of your budget's energy dollars and of the earth by reducing energy waste and energy costs, while protecting the environment.

## 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
- ENERGY STAR Manual de acción para las congregaciones
- Cuadernillo de ENERGY STAR para congregaciones - Apéndices
- Click here for more Tools and Resources

## ENERGY STAR® PortfolioManager®

EPA's online energy management and tracking tool enables you to measure and track the energy and water performance of any building over time. Register now

Jerry Lawson National Manager  
202.343.9314

[lawson.jerry@epa.gov](mailto:lawson.jerry@epa.gov)

[www.energystar.gov/congregations](http://www.energystar.gov/congregations)

[www.energystar.gov/buildings/training](http://www.energystar.gov/buildings/training)

[www.energystar.gov/buildings/help](http://www.energystar.gov/buildings/help)

Follow us on Twitter!

[www.twitter.com/EnergyStarBldgs](https://www.twitter.com/EnergyStarBldgs)

# Project Financing Alternatives



Joe Novoa  
Director of Construction  
Diocese of Orange

# Goals and Objectives of the Borrower

1. Reduce the cost of financing and the overall cost of the project.
2. Maintain balance sheet flexibility enabling the organization the ability to access funds for other needs in the future.
3. Minimize any guarantees which will hurt the ability to access funds in the future.
4. Enable the property owner to take advantage of federal and state tax credits to reduce the cost of the improvements.

# Goals and Objectives of the Financing Provider

1. Get their money back.
2. Earn a reasonable return on the funds.
3. Obtain additional security from the borrower to improve the odds of #1 occurring.
4. Have the ability to take advantage of tax credits and other incentives to improve the return.

# Financing Alternatives

The following are the financing alternatives available:

1. Mortgage debt
2. PACE financing
3. Leasing
4. PPA and ESA
5. Utility provided on bill financing

The cheapest capital normally is the financing alternative that has the highest likelihood of receiving their money back.

# Mortgage Debt

## Pros

1. Easy to understand.
2. A relatively large numbers of debt financing providers.
3. Strong security with a first mortgage on property.
4. Normally the lowest interest rate.

# Mortgage Debt

## Cons

1. Normally a recourse loan meaning the property owner will have to guaranty the financing in addition to the first mortgage.
2. Financing is “on-balance sheet” meaning that it will have to be shown on the borrower’s balance sheet. This will limit the borrower’s ability to access funds in the future.
3. Normally the term of the loan is limited to 10 years or less.
4. A separate sale of the tax credits will be required to take advantage of these benefits.

# PACE

PACE – **P**roperty **A**ssessed **C**lean **E**nergy – is a property tax assessment which secures the project financing.

Since it is a tax assessment and appears on the property tax bill it is senior to all private liens.

PACE is available in 33 states.

# PACE

## Pros

1. 100% financing for the project including all hard, soft and financing costs.
2. Fixed interest rate for terms up to 20 years.
3. Since PACE is a property tax it does not appear on the property owner's balance sheet.
4. PACE is non-recourse meaning there is no guarantee by the property owner.

# PACE

## Cons

1. Since PACE financing is in the form of a property tax it is senior to all private liens. The senior lender on the property must consent to PACE prior to the financing closing.
2. A separate sale of the tax benefits will be required to take advantage of any benefits.

# Leasing

Unlike leasing a car there is no residual value to any energy efficiency or renewable energy equipment financed. You can't "repo" lights, HVAC, solar, etc.

The best sources of lease financing are banks whose appetites for providing lease financing depend on how valuable the tax benefits associated with the equipment are to them and the underlying credit of the property owner.

# Leasing

## Pros

1. Simple, easy to understand.
2. The provider of the lease takes advantage of the tax benefits associated with the equipment and “passes” them on to the property owner.
3. Normally covers 100% of all hard and soft costs.
4. Fixed payment over the term.

# Leasing

## Cons

1. Since the equipment does not have any residual value the inherent interest rate is substantially higher than PACE or debt financing.
2. Terms are normally less than 10 years.
3. Leasing financing is on-balance sheet which reduces future financial flexibility.
4. Depending on credit payments may have to be guaranteed by the property owner.

# PPA and ESA

A PPA, **P**ower **P**urchase **A**greement, requires the property owner to purchase the power generated by solar or wind at a pre-determined price over the term of the agreement.

An ESA, **E**nergy **S**ervices **A**greement, requires that the property owner pay the provider a portion of the energy savings generated by energy efficiency equipment installed.

# PPA and ESA

## Pros

1. 100% financing for the equipment over a term of up to 20 years.
2. The rate power is purchased and the amount of savings to be paid over the term is usually determined at the beginning of the agreement.
3. PPA and ESA providers receive the tax benefits associated with the equipment and “pass” them on to the property owner.

# PPA and ESA

## Cons

1. Since the equipment does not have any residual value the inherent interest rate is substantially higher than PACE or debt financing.
2. Agreements can be complex when determining when the property owner has to purchase the energy or the amount of the savings generated by the equipment, etc.
3. PPA and ESA agreements will require a guaranty of the payments by the property owner.

# Utility On-Bill Financing

1. Some utilities will offer “On-Bill Financing” – check with your local utility.
2. Typically no interest
3. Payments are made as a line item on your energy bill

# Utility On-Bill Financing

## Pros

1. Interest Free Loan

## Cons

2. Often the maximum amount is limited to \$100,000

# Conclusion

- By implementing energy efficiency and renewable energy we can reduce our operating costs improving the financial situation of our parishes, schools and other properties.
- Choosing the right financing approach is more than just focusing on the lowest rate. We need to consider the term, guaranty and whether the financing is off or on balance sheet.
- Utilizing financing we can do the right thing by improving our environment and show the community at large that we practice what we preach.

# Contact Information

Joe Novoa

Director of Construction

Diocese of Orange

Office: (714) 3012

[jnovoa@rcbo.org](mailto:jnovoa@rcbo.org)



# SACRED HEART PARISH ENVIRONMENT STEWARDSHIP

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# Environmental Stewardship

“I would like to ask all those who have positions of responsibility in Economic, Political, and social life, and all men and women of Good-Will: *Let us be protectors of creation, protectors of God’s plan inscribed in nature, protectors of one another and the environment*”

Pope Francis, 2015 Encyclical on the Environment



# St. Francis Pledge



## TAKE THE **ST. FRANCIS** PLEDGE

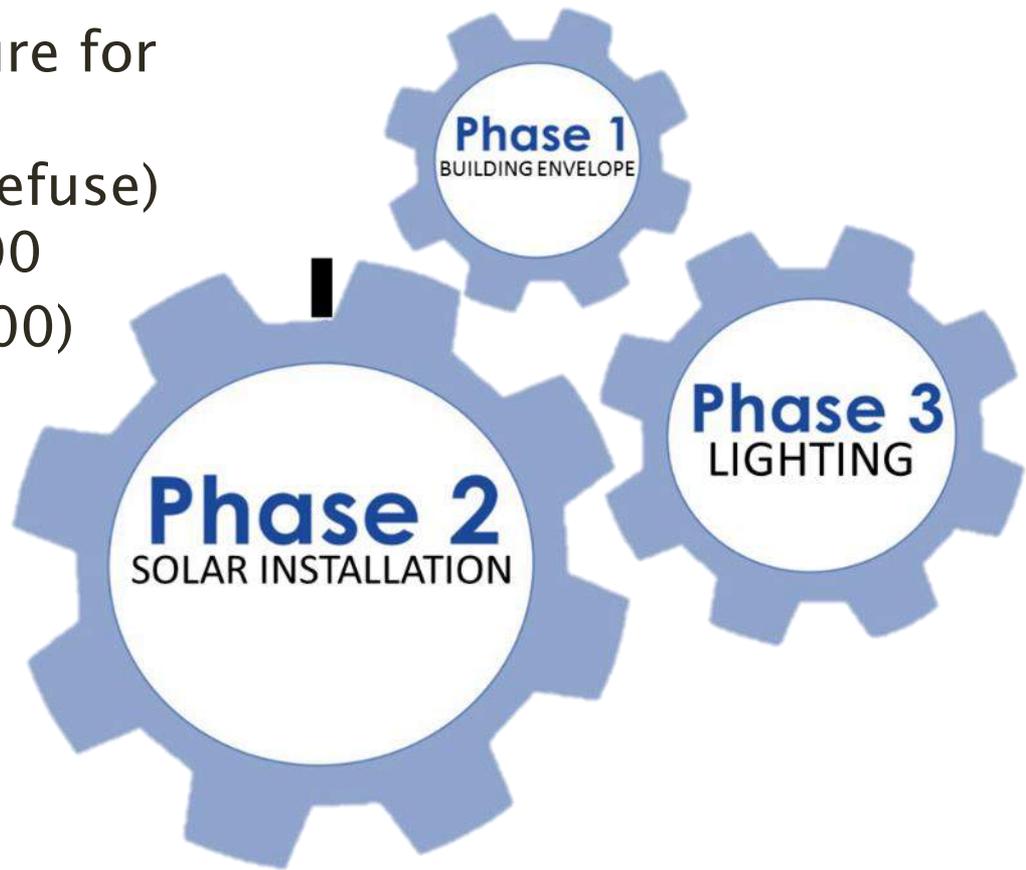
YOUR FIRST STEP IN THE RIGHT DIRECTION TO CARE FOR CREATION AND THE POOR

### I/We Pledge to:

- ▶ **PRAY** and reflect on the duty to care for God's Creation and protect the poor and vulnerable.
- ▶ **LEARN** about and educate others on the causes and moral dimensions of climate change.
- ▶ **ASSESS** how we—as individuals and in our families, parishes and other affiliations—contribute to climate change by our own energy use, consumption, waste, etc.
- ▶ **ACT** to change our choices and behaviors to reduce the ways we contribute to climate change.
- ▶ **ADVOCATE** for Catholic principles and priorities in climate change discussions and decisions, especially as they impact those who are poor and vulnerable.

# Clean Energy Retrofit 2012 – 2015

Our Annual Expenditure for  
Utilities  
(Electric/Gas/Water/Refuse)  
decreased \$65,000  
(\$94,500 to \$29,500)



# Building Envelope (Phase One)

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

-----

2015 Annual Savings  
\$9,000 Water  
\$10,500 Gas

IRRIGATION SENSORS



LOW FLOW FIXTURES



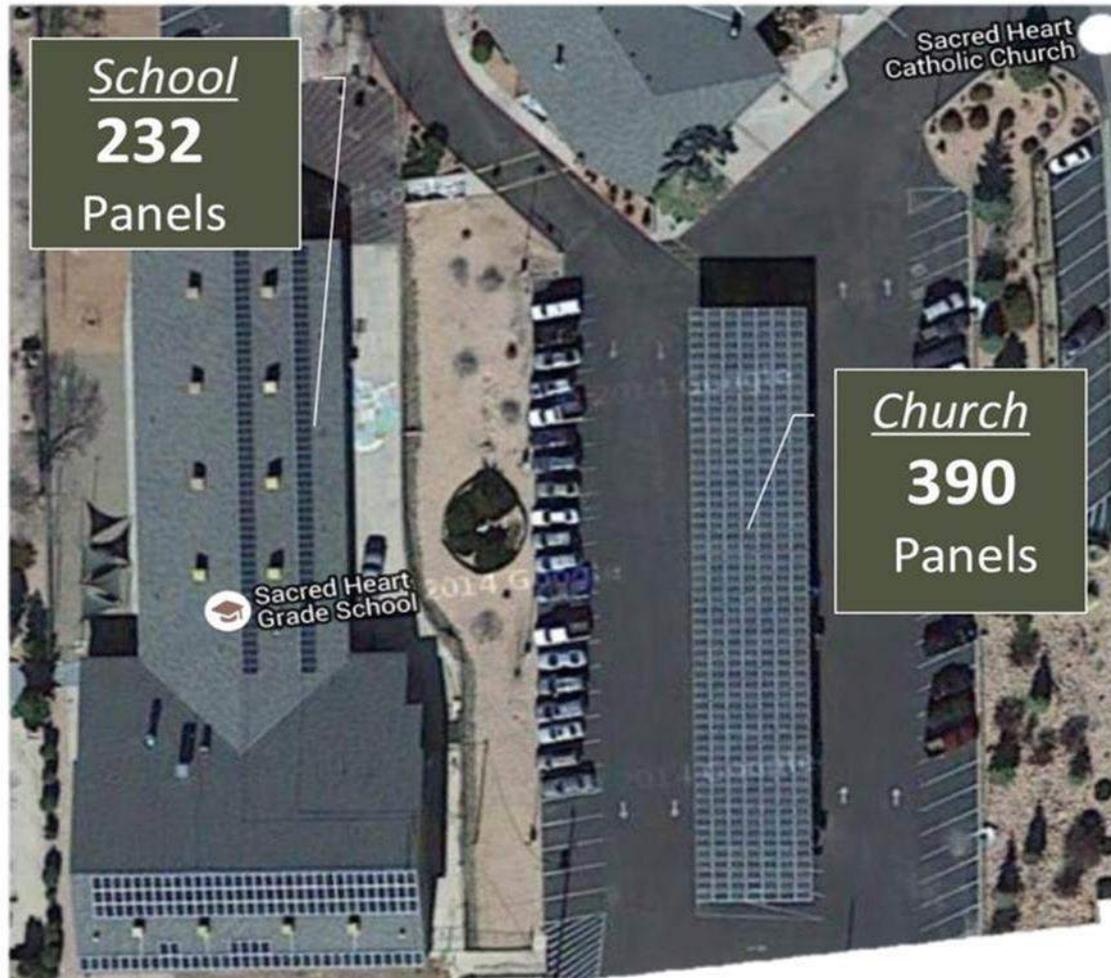
INSULATION ADDED TO PIPES & WALLS



THERMAL PANE ARGON GAS FILLED WINDOWS



# Solar Installation (Phase Two)



# Solar Installation (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 full year alone

SOLAR ROOFTOP ARRAY



SOLAR CARPORT



SCHOOL INVERTER



CHURCH INVERTER



# Lighting (Phase Three)

750 LED Lights Installed  
Throughout Parish (97%)

-----

Changes Have Resulted  
In Savings of Over  
\$12,600 Annually

-----

Longer Life Yields Added  
Maintenance and  
Reliability Savings

-----

Lower Residual Heat  
Reduces Cooling Costs

INTERIOR ROOMS



EXTERIOR AREAS  
PARKING/WALKWAYS



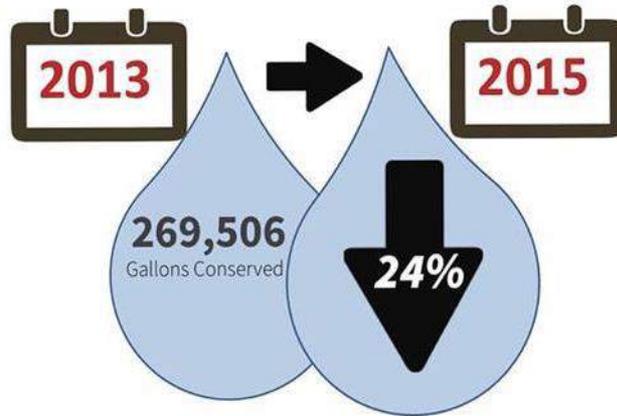
GYMNASIUM



SANCTUARY



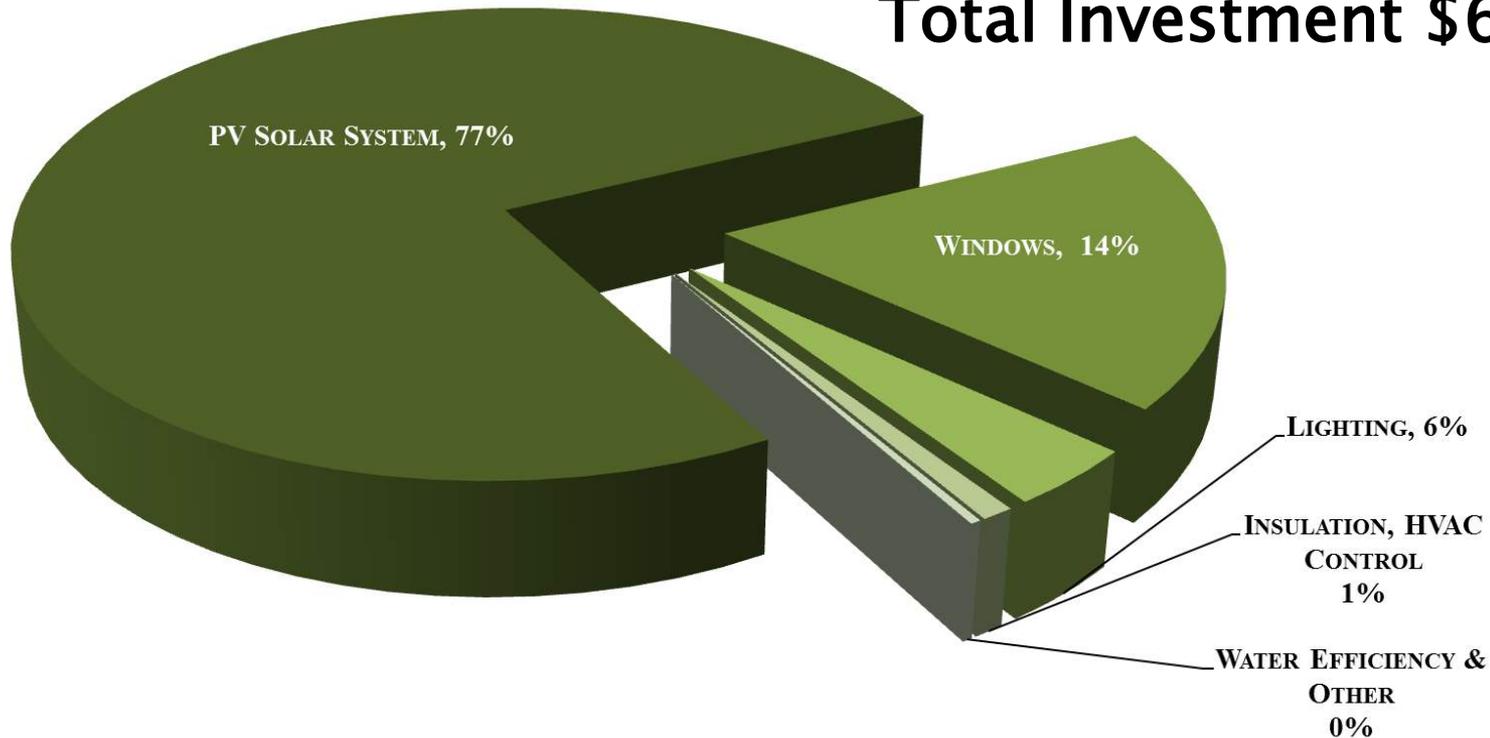
# Retrofit Results



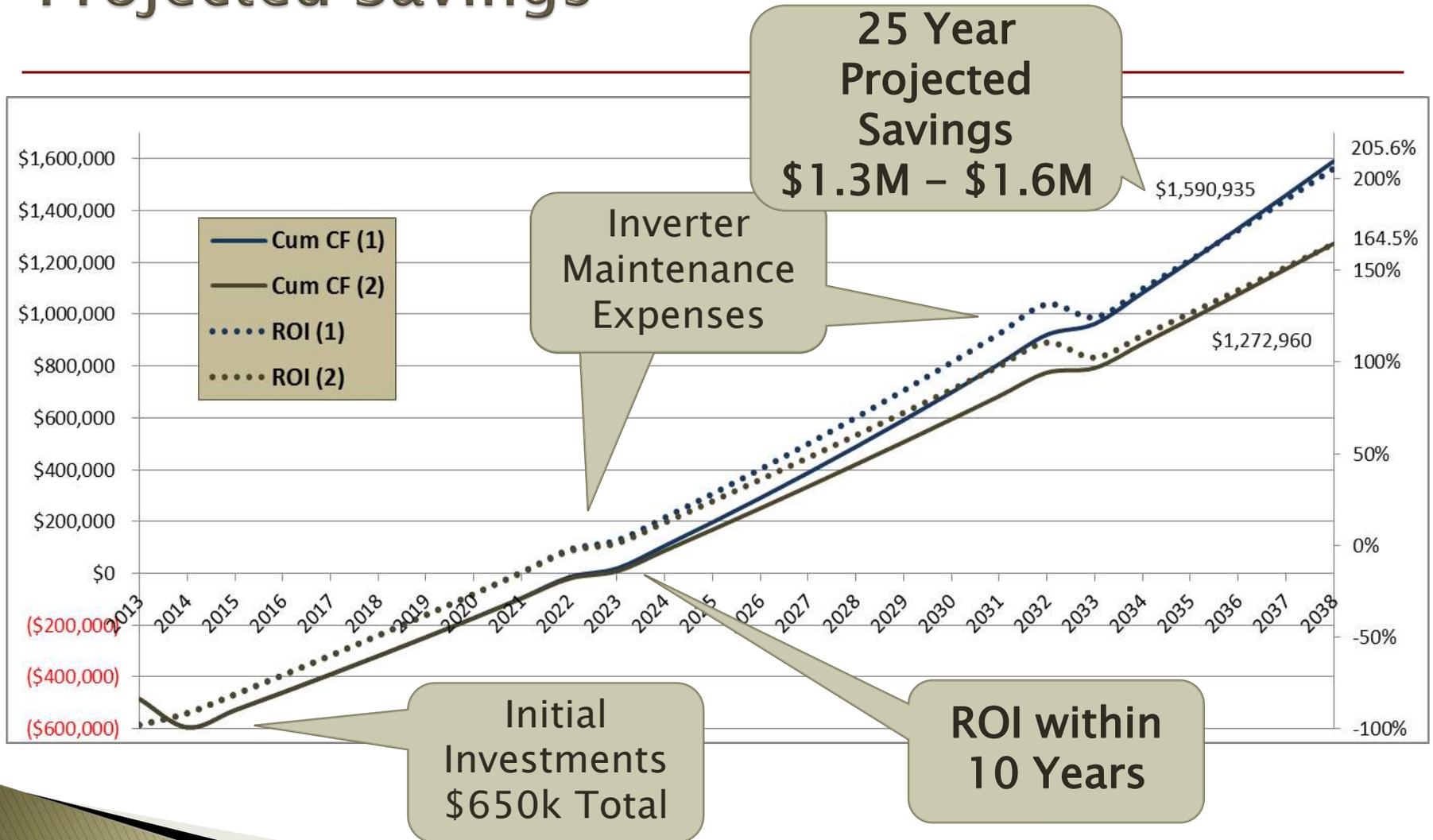
# Total Investment (Non-Recurring)

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**Total Investment \$650,000**



# Return On Investment (ROI) Projected Savings



# The Pope's Climate Encyclical

## A Church at a Time

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Bringing the Pope's Climate Encyclical to Life, a Church at a Time

By Nancy Buzby 23 Jun 2015 EDF Business Blog

“...(Sacred Heart Parish of Prescott) has developed scalable solutions for *the* church and school that could and should be replicated across all churches, schools and relevant organizations.”

“...a clean energy retrofit covering lighting, windows, waste, and solar power that dramatically reduced their utility spending from \$94,500 a year to \$29,500 (or \$178 in daily savings) and transformed the 32,000 square foot school into a ~~near~~ net zero building (*for electrical consumption*).”

# Sacred Heart Parish & Stewardship

Solar Power at Sacred Heart provides 257.37 MW AC Per Year, The Environmental Impact over 25 Years is:



Pounds of CO2  
Offset:

9,781,307 lbs



Tree seedlings grown  
for 10 Years:

113,762 Seedlings



Pounds of Coal  
Burned:

4,765,549 lbs



Gallons of Gasoline  
Consumed:

499,238 Gallons

<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

# Environmental Stewardship Includes Daily Expendable Products



We are proud to share the benefits of your new and improved cleaning program!

Act: To change our choices and behaviors to reduce the ways we contribute to climate change



**TRASH LINERS**

- 38% reduction in greenhouse gases when compared to the manufacturing of traditional liners.



**MICROFIBER**

- Color coded for prevention of cross contamination
  - Green: Food Service
  - Yellow: Specialty Dusting
  - Red: Restroom Areas
  - Blue: General Cleaning
- Ergonomic
- 7,800 gallons of water saved per year / 39,000 over 5 years
- High performance cleaning
- 83% reduction in chemical usage



**CHEMICALS**

- Sourced from the 13th greenest company worldwide
- All hard surfaces to be disinfected nightly



**ROLL TOWELS**

- 30% reduction in packaging
- 22.5% reduction in cost
- 30% reduction in labor



**FLOOR PADS**

- Made from 100% recycled PET plastic from water bottles
- 38 12oz. water bottles = 5 20' floor pads
- 90% biodegradation after 400 days in a landfill as compared to 7% for conventional pads

# Sacred Heart and Energy Benchmarking with Portfolio Manager

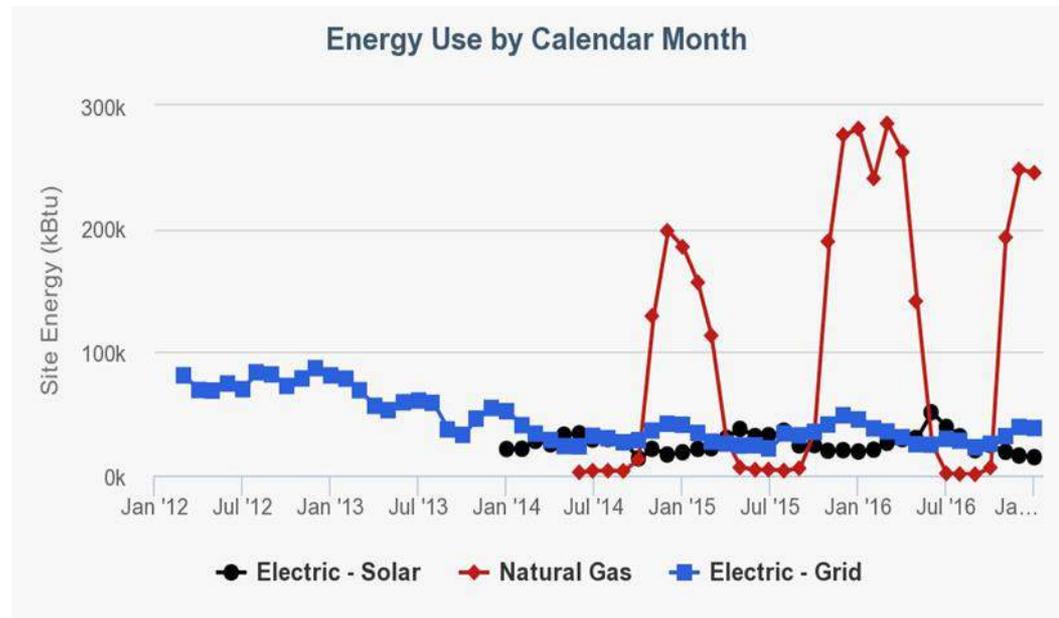
Both the school and the church have been using EPA's ENERGY STAR Portfolio Manager online tool to benchmark the two properties. This tool allows them to:

- Assess whole building energy use and costs on a monthly basis
- Track solar PV production and sales back to APS
- Share/report data with others
- Compare the properties to others of similar size/type and receive a 1 - 100 score



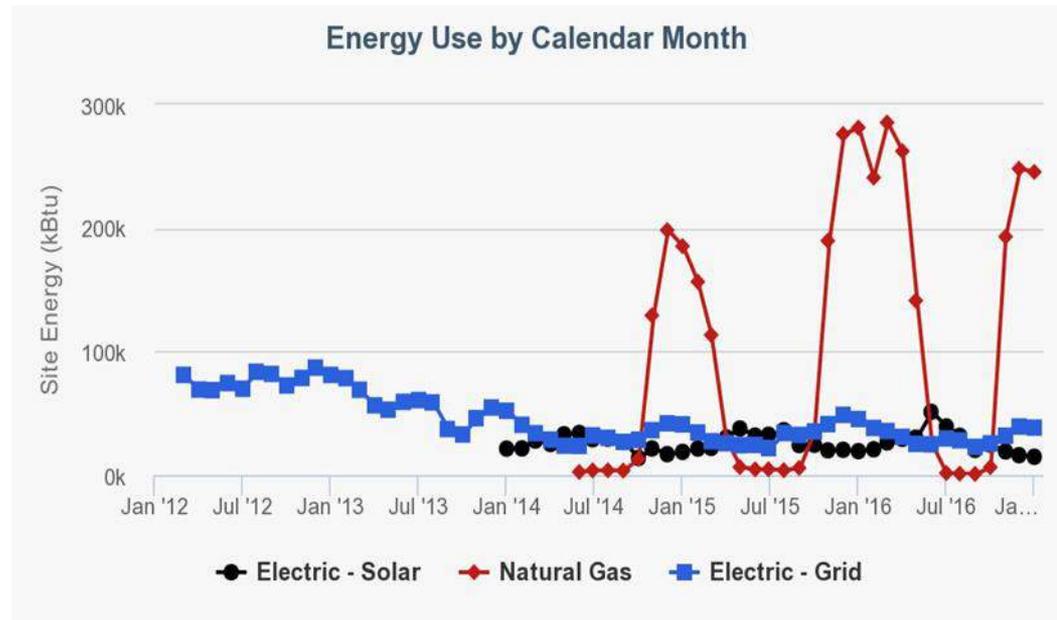
# Sacred Heart School

- The school uses electricity from the grid and solar PV; natural gas for heating.
- The school's outstanding energy performance gives it a score of 100/100 (the highest possible) and makes it eligible for ENERGY STAR certification.
- From 2012 - 2017, energy costs decreased by over 80% (from \$17,000 to \$3,000)
- Last year the school emitted 60 metric tons GHG (energy-related); the median school emitted 329 metric tons.



# Sacred Heart Church

- The church uses electricity from the grid and solar PV; natural gas for heating.
- Even with the long operating hours, the inefficient swamp coolers, and a commercial kitchen with 12 refrigeration units, the parish scores 87/100—making it eligible for ENERGY STAR certification.
- From 2016 – 2017, total energy costs were about \$19,000; the median property (similar size, location, type) had annual energy cost of \$34,000.
- The church emits about half as many energy-associated GHG emissions as a comparable property.
- Planning many more improvements.



# Added Savings, Added Flexibility

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- ▶ Environmental Stewardship Works for Sacred Heart Parish
- ▶ It Will Work for Others
- ▶ Redirect Utility expenses towards the critical missions or programs (e.g. Evangelization, Habitat for Humanity, Youth/School Programs, etc.)
- ▶ Buffer against reduced number of parishioners or plate collections
- ▶ Water consumption reductions
- ▶ Increase your social capital
- ▶ Utilize Energy Monitoring/Automated Tools to Dynamically Assist in Real Time Assessments
- ▶ Lead the way into a better future

# In Closing

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- ▶ Energy Efficiency and Water Conservation measures should be assessed and tackled first
- ▶ A complementary Solar Investment then creates a visible Legacy of Environmental and Financial Stewardship
- ▶ Success breeds success, get started with something, get others excited
- ▶ The cost of doing nothing about utility expenses is significant and long lasting
- ▶ There is a variety of methods to fund and finance your projects
- ▶ Not just a pragmatic program and business imperative but a moral mandate of multiplying missions
- ▶ 60 Second Drone Flyover of Sacred Heart Parish  
<https://youtu.be/GBYjn9UXij0>

# Energy Department Update

April 24, 2017



ARCHDIOCESE  
*of*  
NEW YORK



# Energy Department Vision & Mission



ARCHDIOCESE  
*of*  
NEW YORK

## ▶ Vision

- Become a regional leader in energy conservation and carbon reduction by implementing energy savings improvements across all ADNY facilities to preserve asset values and sustainability.

## ▶ Mission

- Work with parishes, schools, and key stakeholders in planning and implementing energy conservation measures which will help reduce greenhouse gas emissions and the energy expense associated with facilities operations.



# Our Goal



ARCHDIOCESE  
*of*  
NEW YORK

- ▶ Reduce the roughly \$40 Million spent annually on energy across the ADNY portfolio by 10–20%.



# How Do We Plan to Achieve our Goal?

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# Energy Conservation Initiatives

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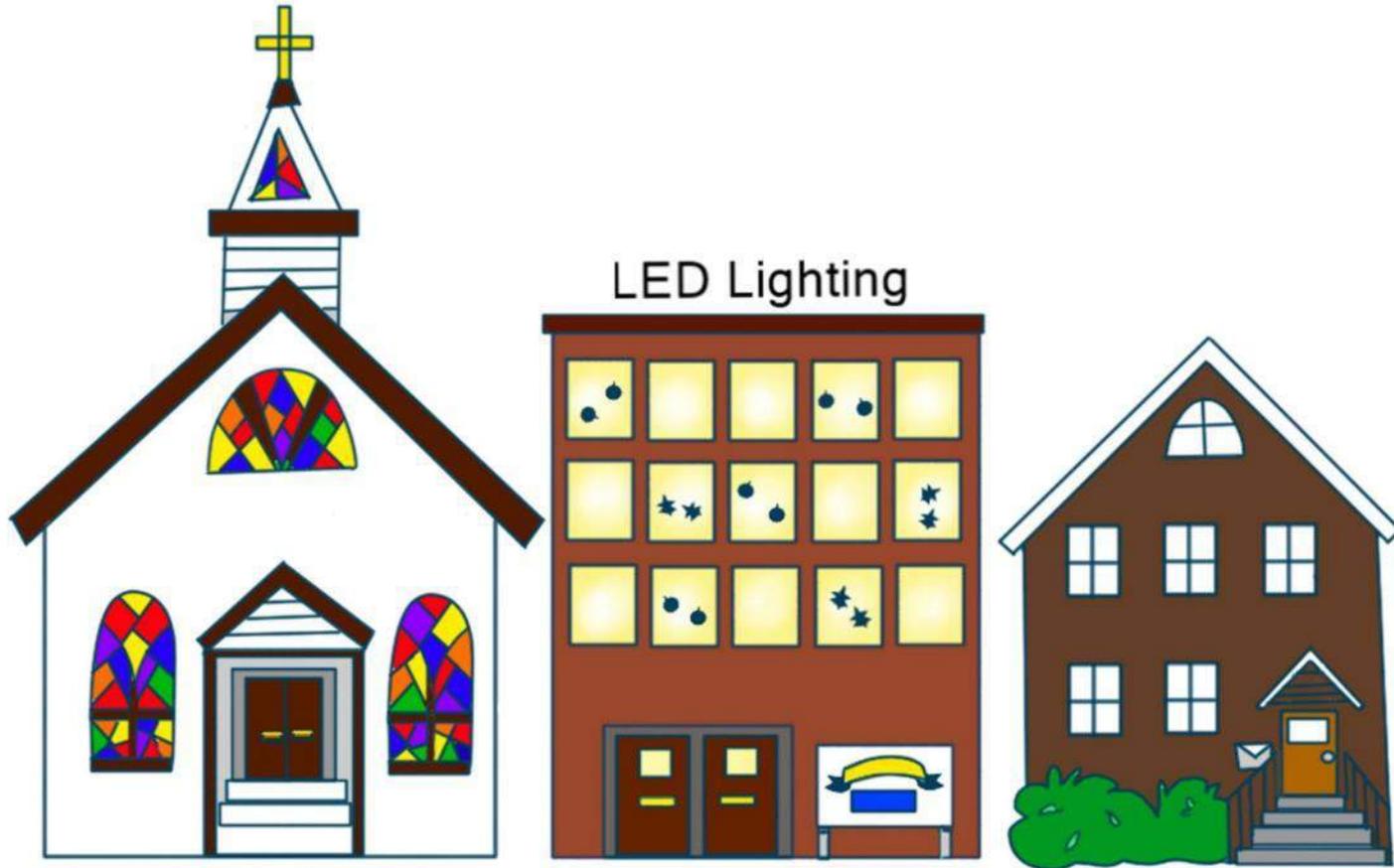
# Energy Audits

Energy Audits	# of Parishes
Total Completed	101
Renew + Rebuild capital campaign	52
Post-audit implementation meetings completed	76
ECM projects being implemented	59
Estimated annual savings of ECMs being implemented	\$591,375



# Energy Conservation Initiatives

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# LED Lighting

LED Lighting	# Parishes	Avg. Utility Incentive	Estimated Annual Savings	Average Payback (Months)
Lighting survey completed	74	NA	NA	NA
Cost proposals received	70	56%	\$1,094,984	16.0
Installation completed	21	56%	\$393,383	13.2



# Energy Conservation Initiatives

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# Energy Conservation Initiatives

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Energy Procurement



# Energy Conservation Initiatives

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Solar Panels



# Energy Conservation Initiatives

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# Parish Business Manager Training

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- ▶ Why is benchmarking important?
  - Can't manage what you don't measure.
- ▶ What is ENERGY STAR Portfolio Manager?
  - EPA created online tool to measure and track energy, water consumption, and greenhouse gas emissions.
  - Use to benchmark the performance of one building or whole portfolio of parish buildings in a secure online environment.
  - Required for NYC LL 84 compliance for buildings 25,000 sq. ft. and larger.
- ▶ ENERGY STAR Portfolio Manager Training
  - Live training with EPA
  - Existing Webinars



# Thank You

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- ▶ Martin Susz, Director of Energy Management
  - [martin.susz@archny.org](mailto:martin.susz@archny.org)
  - 212-371-1011 Ext. 2957 or 646-236-8954
- ▶ Ryan McCabe, Associate Director of Energy Management
  - [ryan.mccabe@archny.org](mailto:ryan.mccabe@archny.org)
  - 212-371-1011 Ext. 2622 or 860-705-3766
- ▶ Vince Massop, Mobile Energy & Repairs Specialist
  - [vince.massop@archny.org](mailto:vince.massop@archny.org)
  - 914-968-6200 Ext. 8168 or 917-340-0639





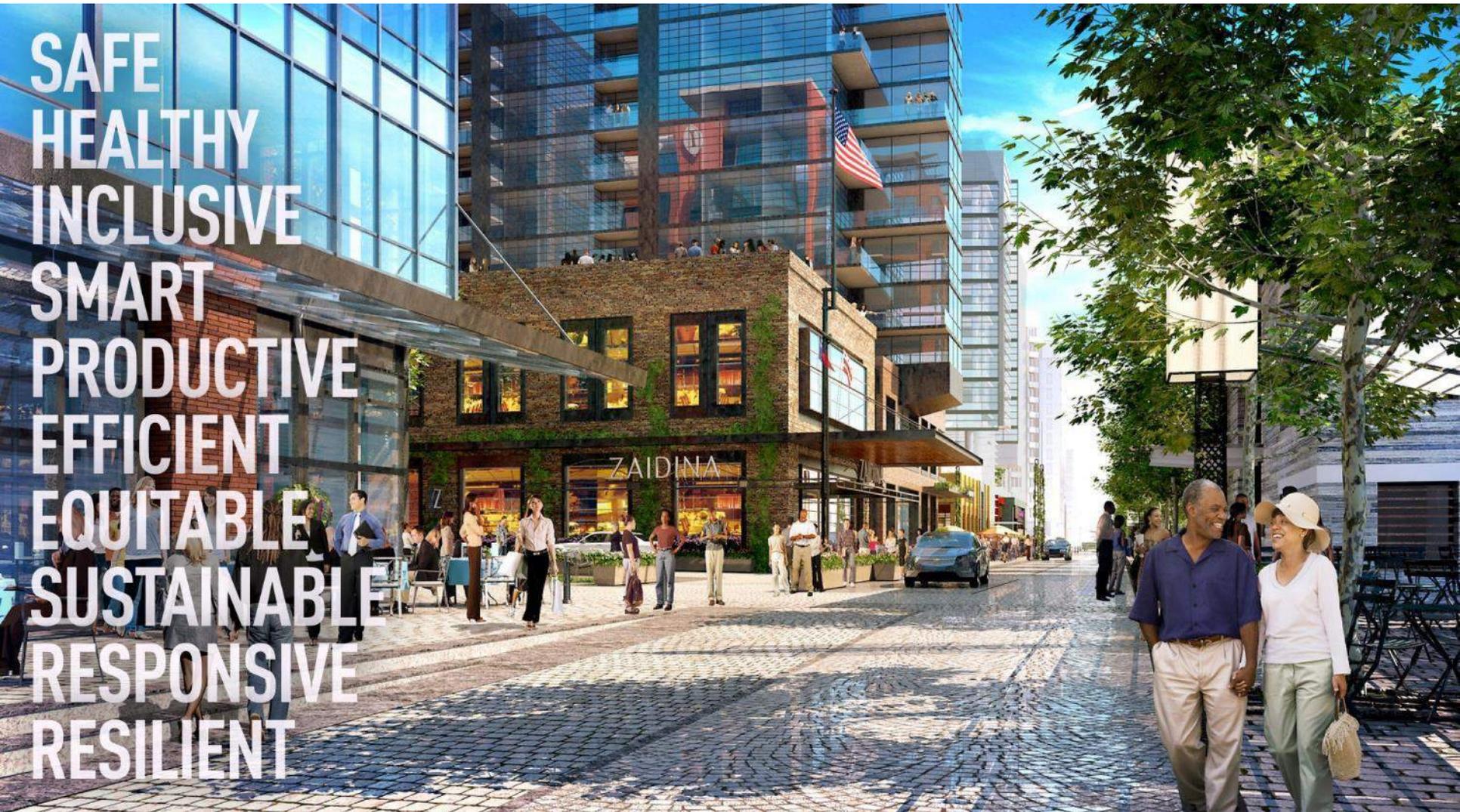
**The U.S. Green Building Council (USGBC<sup>®</sup>)** and its community are changing the way buildings and communities are designed, built and operated. We believe in better buildings; places that complement our environment and enhance our communities. Places that give people better, brighter, healthier places to live, work and play.



**GREEN BUILDINGS  
FOR EVERYONE  
WITHIN THIS  
GENERATION**



SAFE  
HEALTHY  
INCLUSIVE  
SMART  
PRODUCTIVE  
EFFICIENT  
EQUITABLE  
SUSTAINABLE  
RESPONSIVE  
RESILIENT





# SYSTEMS GOALS



Reduce contribution to **global climate change**



Enhance individual **human health**



Protect and restore **water resources**



Protect and enhance **biodiversity and ecosystem services**



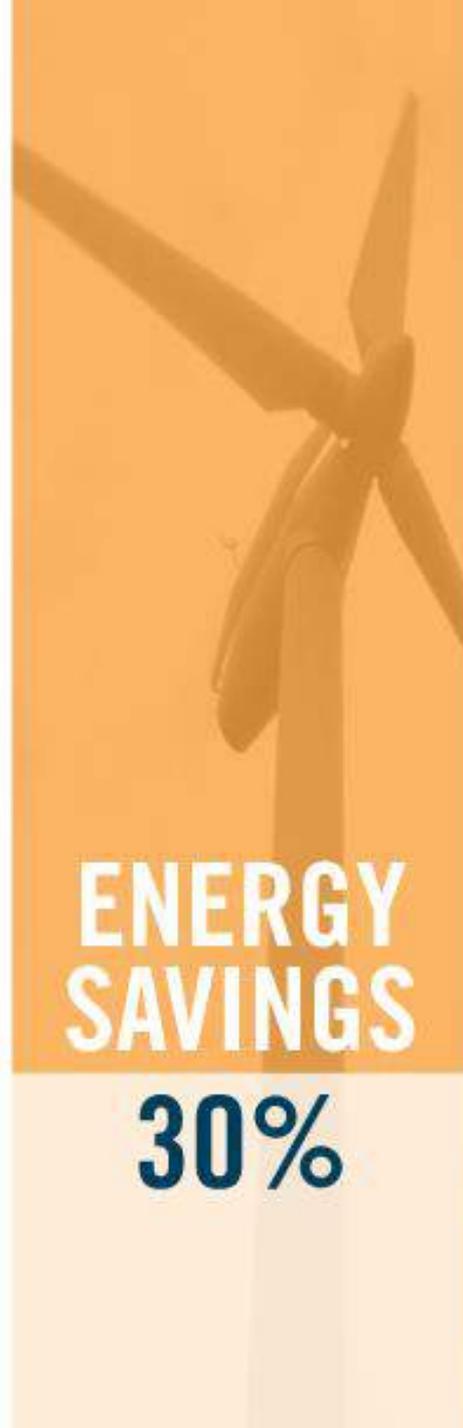
Promote **sustainable and regenerative** material cycles



Build a **green economy**



Enhance **community quality of life**

A silhouette of a wind turbine against an orange background.

**ENERGY  
SAVINGS**

**30%**

A green-tinted image of a sky with white clouds.

**CO2  
SAVINGS**

**35-50%**

A clear glass filled with water, set against a blue background.

**WATER  
USE  
SAVINGS**

**35-50%**

A white plastic waste bin, set against a teal background.

**WASTE  
COST  
SAVINGS**

**50-90%**

In the next 10 years, we need to ensure a  
**sustainable future for all**



**LEED**

**WELL**

**PEER**

**GRESB**

**SITES**

**EDGE**

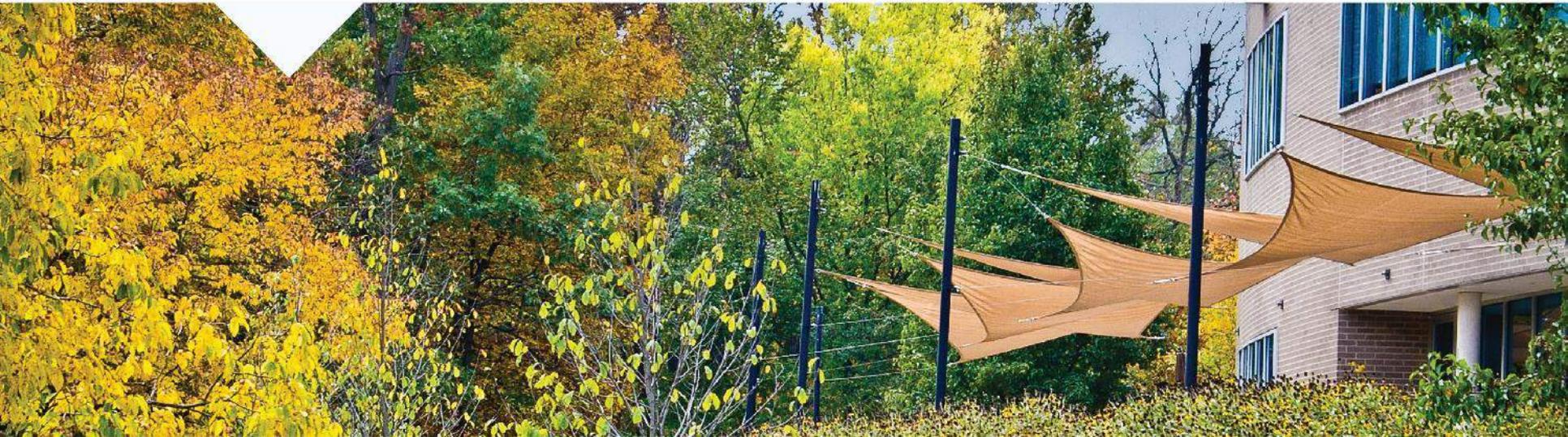
**PARKSMART**

**ZERO WASTE**

**ICP**



The **Sustainable Sites Initiative (SITES®)** offers a systematic, comprehensive rating system designed to define sustainable sites, measure their performance, and ultimately elevate the value of landscapes. Administered by GBCI, the SITES rating system can apply to development projects located on sites with or without buildings, including open spaces, streetscapes and plazas, commercial, residential, educational/institutional, infrastructure, government, military and industrial.



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# zerowaste

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GBCI's certification system for business to define, pursue & achieve their Zero Waste goals, thereby reducing their impact on the natural environment and our collective health.

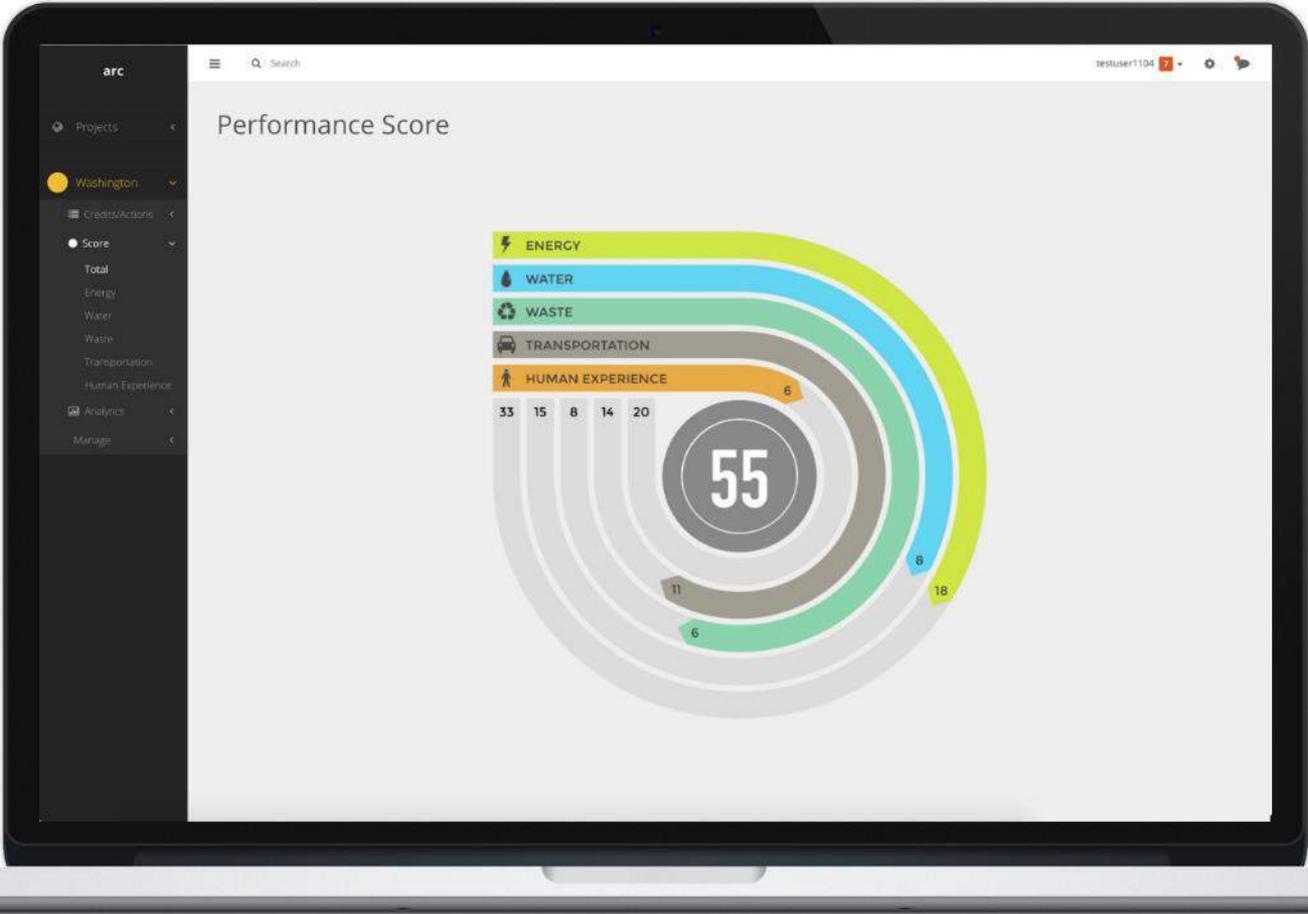


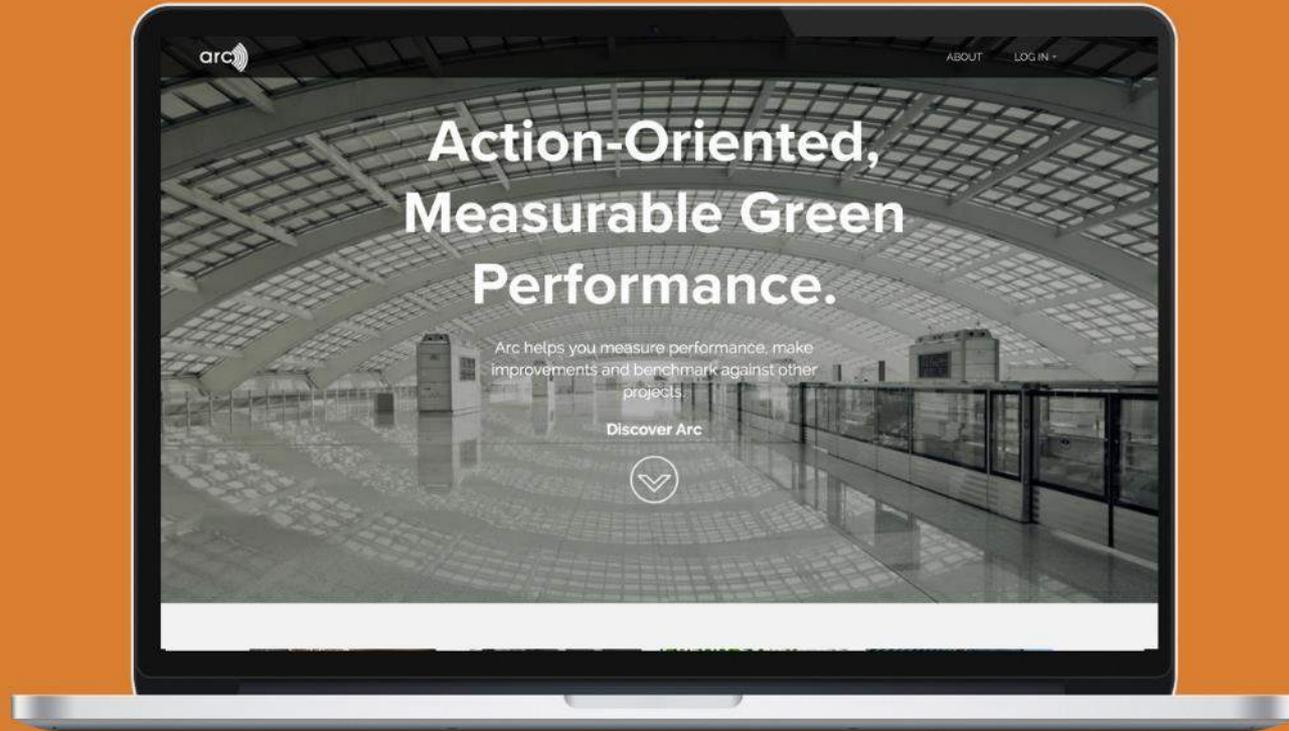
**PEER™** is a dynamic, adaptive rating process designed to measure and improve sustainable power system performance. The PEER system serves as a tool to accelerate transformation of the electricity sector. By engaging in the PEER process, power grids have an opportunity to gain competitive advantage by differentiating their performance, documenting the value produced, and demonstrating meaningful outcomes.





Your building is alive.





[arcskoru.com](https://arcskoru.com)



# ADVANCE Campaigns



Education



Faith



Service



Housing



Veterans



Community

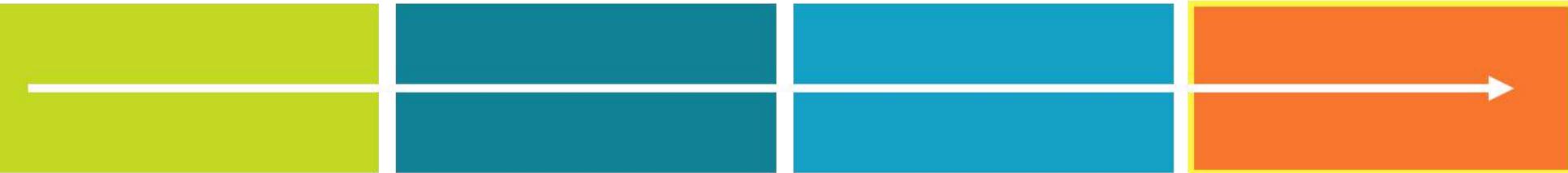
*Advancing equity through community sustainability*

”The green building movement is living proof that real change starts with people—real change starts with **you & me.**“



# ADVANCE

*a campaign to advance the complete green building market*



Relationship Building  
Awareness Raising  
Kick START Workshop  
START Survey  
Benchmarking  
Team Building

Team Building  
Organizational  
Commitment  
Data Analysis  
PLAN Builder Workshop  
Action Plan

Policy Development  
User Engagement  
Renovations & Upgrades

Celebration  
Media  
LEED  
WELL  
ENERGY STAR



START

PLAN

ACT

LEED



START

PLAN

ACT

LEED



START

PLAN

ACT

LEED



START

PLAN

ACT

LEED

## ADVANCE Campaigns

### Scope

U.S. Green Building Council

- ✓ Introductory education and resources
- ✓ KickSTART Workshop
- ✓ START Surveys
- ✓ Energy & Water Benchmarking in ENERGY STAR Portfolio Manager
- ✓ PLANBuilder Workshop & Report
- ✓ FOCUS Action sheets & service days

# LEED® Core Concepts Guide

An Introduction  
to LEED and  
Green Building

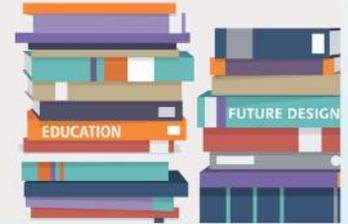
# THE PAID-FROM-SAVINGS GUIDE TO GREEN EXISTING BUILDINGS



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Green Building Research Institute (GBRI)  
★★★★



**SUBSCRIPTION**  
The Living Building Challenge in Practice  
USGBC Missouri, Ramsey Chapter  
★★★★ \$45



**SUBSCRIPTION**  
Quarterswest American Hardwood in Sustainable Design  
America Training Solutions  
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**SUBSCRIPTION**  
LEED v4 Key Terms for Green Associates, BD+C and ID+C Exam Prep  
Green Building Research Institute (GBRI)  
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Green Building Research Institute (GBRI)  
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**SUBSCRIPTION**  
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Ready to get started?

Ryan Snow – [rsnow@usbc.org](mailto:rsnow@usbc.org)

U.S. Green Building Council

✓ [www.usgbc.org](http://www.usgbc.org)

✓ [www.gbci.org](http://www.gbci.org)

✓ [www.arcskoru.com](http://www.arcskoru.com)

This concludes The American Institute of  
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