IPRO 328

Church and School Energy Efficiency Program

CHURCH GREEN
A New Color For A New World

Background

- Project inspired by Vince Cushing of Clean Urban Energy to help churches make energy improvements.

Case Study_Old St.Mary's Church/School

Problem

- Private schools and religious institutions often overlook money saving opportunities from energy efficiency improvements.
- Older buildings bleed energy, and their owners may lack the knowledge to address these energy issues.

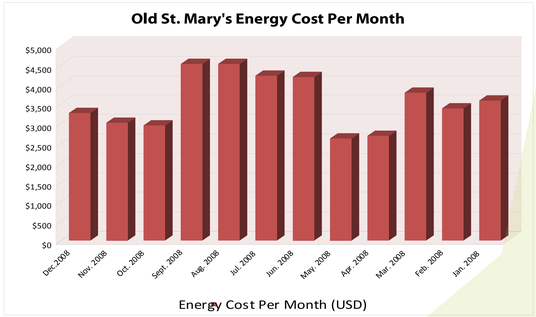
Objectives

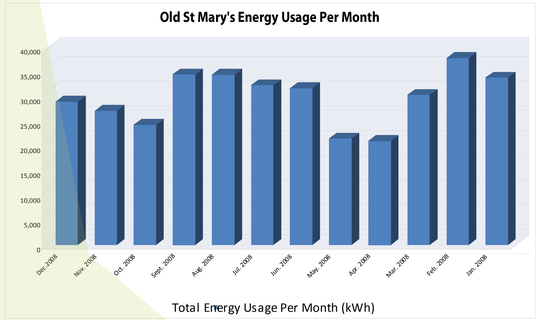
- Set up a data monitoring system in selected churches and schools that will record real time energy usage
- Design a promotional and functional website
- Research funding options for energy efficiency programs, including the intracting method
- Research past churches and schools for successes and failures in attempted energy usage improvements
- Create a metric that can be used to determine possible candidates for the proposed system
- Identify low-cost, easily implementable solutions for facilities that can generate energy savings

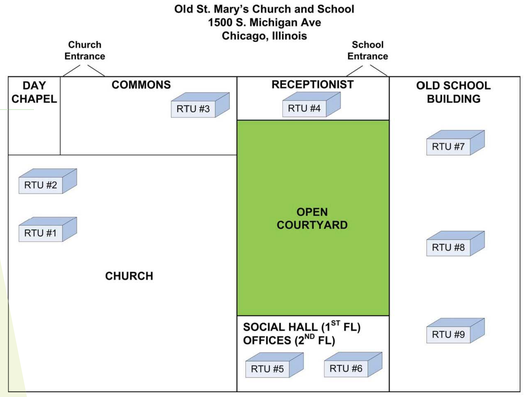
Data

- Old St. Mary's -

Total Energy Usage For 2008 (kWh)	358,079
Total Energy Usage For 2008 With Green Savings (10%)	322,271
Total Energy Cost For 2008 (USD)	$42,821
Total Energy Cost For 2008 With Green Savings (10%)	$38,539







Database of churches/schools in Bronzeville

Surveys were issued to the churches and schools that had been identified asking for more detailed information about their buildings and operations, such as occupancy data, past energy usage, type of building construction and HVAC systems, as well as any of their own future energy efficiency improvement plans.

Survey from Schools and Churches around Bronzeville Area
Marketing Opportunity Team Research
(Last update. 04/21/09)

* Leroy Kenndy available to contact

ID	CHURCH NAME	PICTURE	FUTURE PLAN	YEAR OF CONST.	FREQUENCY OF OCCUPANCY	TYPE OF CONST.	TYPE OF WINDOW	TYPE OF HEATING SYSTEM	AIR CONDI-TIONING	TYPE OF LIGHTING	NO. OF ELECTRIC METERS	ATTEMPT ON REDUCING ENERGY USE	REMARKS
CC6	St. Barbara church Rev. Dennis A. Ziomek 2859 S. Throop St Chicago, IL 60608		Have several major Chruch renovation plans, including the painting of the interior of the Chruch for our Centennial in 2010	1914	1. Daily for Weekday 2. Sunday Mass 3. Funerals, Weddings	Brick. 90 ft. dome. No celing insullation	Stained Glass with lexan protecting on the outside	**Steam heat,** from two Kawanee boilers which heat the school, gym, and church. **Boilers** in a separate building from church	No	Mercury Vapor	One for each building on the parish grounds	No	1. Chruch oozes heat to the outside 2. Enomours heating bills
CS8	St. Barbara school 2830 S. Quinn St. Chicago, IL 60608			1910	1. Monday-Friday during School Year 2. Weekend events	Brick	Aluminum Windows		No	florescent		Enron Modifications	
BC1	* Mt Carmel Baptist Church Rev. Robert Jones 2976 S Wabash Ave Chicago, IL 60616		1st Floor – 1952: Renovation to 1st floor and completion of 2nd Floor – 1964 Renovation and completion of educational facility to include three floors – 1989 None of Future plan right now		Daily	Brick & Stone Veneer	Aluminum/ doubleglazed	Boiler-Hot Water & Forced Air	Yes	Fluroescent	One	Nothing recent Most of our energy reduction practices have been in place for some time. Reduced temps in low use areas, reduced lighting, zoning of our heating and cooling, etc..	
CC2	*St. Elizabeth Parish & School Fr. Richard R. Andrus 50 E. 41st. Street Chicago, Il. 60653		A number of renovation projects ; new foundation, roofing, interior rehad	Various length of history – 6 buildings oldest built early 1900's	Daily – 24-365!	Brick	Aluminum, single mostly	Various ages; steam, forced air, hot water	Window units and Central Units	Fluorescent	At least 6	Electric about 10 years ago	

Funding

An essential aspect of an energy efficiency project is finding funding from different sources.

25-50% can be funded with:
- Utility Incentives
  - ComEd's Smart Ideas for Your Business
- Grant Programs
  - The Illinois Clean Energy Community Foundation

The rest is funded by:
- Bank Loans
- Donations
- Intracting

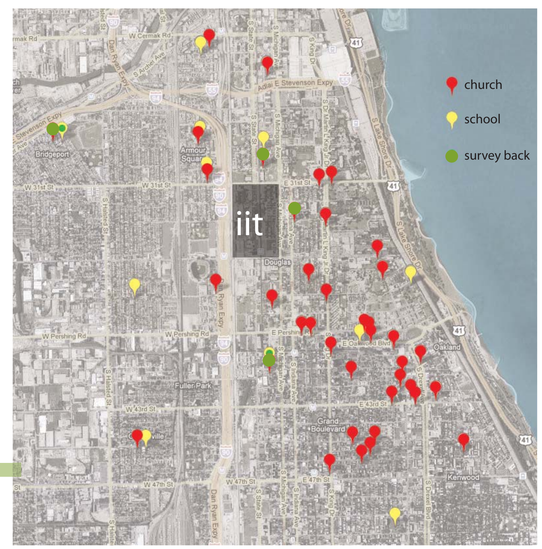
How Intracting Works

Patrons offer money to the organization

The organization uses the money to reduce its energy use

The money saved is paid back to the donor with a small return

Additional savings goes towards more efficiency improvements or other ways to help the community



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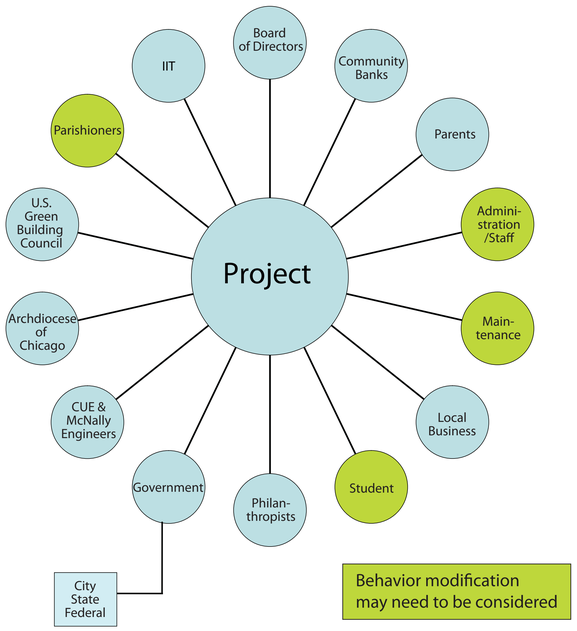
Stakeholders

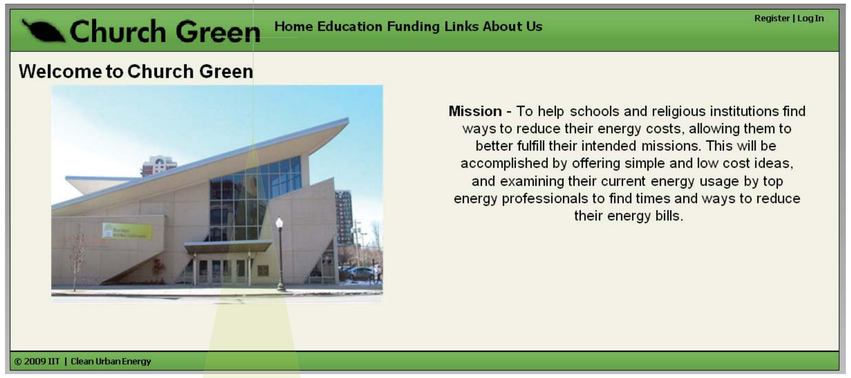


Behavior modification may need to be considered

Website

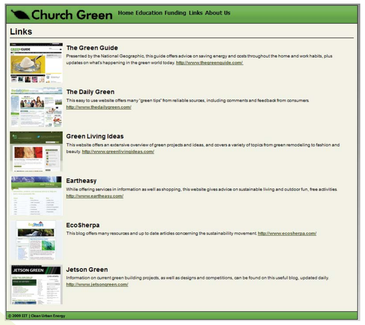
- Educational tool
- Analysis tool
- Networking tool
- Funding tool
- Monitoring tool

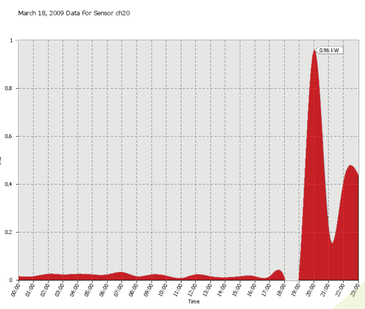
Home



Education

Links





Real Time
Energy Usage Monitoring

Future Plans

Through analyzing the data and other factors, the team has these recommendations for next step:

- Conduct more research on intracting and other forms of funding
- Design a training program so the team will be able to conduct preliminary energy audits

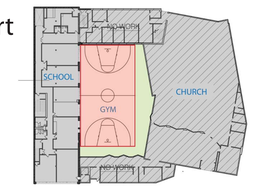
  Education
  Equipment study
  In Field Study
  Diagnosis
  Problem solving
  Recording data
- Identify future candidates for the project

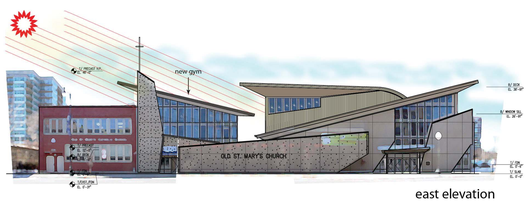
Architecture

Case Study: Old St. Mary's Church/School

Covering the Center Court to add a New Gym

Reducing heat loss from south and west facades on the center court





east elevation

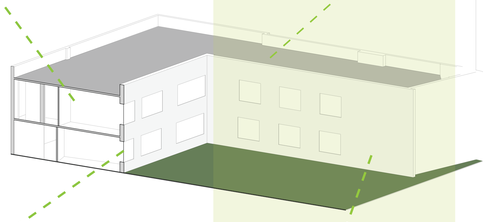
Possible Energy Saving Methods

Dropped Ceilings
Thermal Masses
Reversible Fans
Demand Controlled Ventilation
Lighting Upgrade

INTERIOR TREATMENTS

Updated Equipment
Refective Membrane
Green Roof
Insulation Upgrade

ROOF TREATMENTS



WINDOW TREATMENTS

Replace
Re-Seal
Thermal Shading
Storm Windows

COURTYARD WALL TREATMENTS

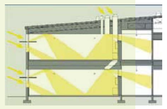
Over-Cladding
Re-Clad

Simple Solutions
to Improve Your Energy Efficiency

Light Shelves

Light shelves help bounce light to maximize daylighting in a space.

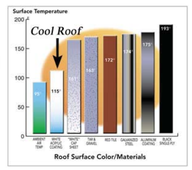
More sunlight = Less use of light bulbs



Light Colored Surfaces

Dark colors absorb heat whereas light colored surfaces reradiate it almost immediately.

Less air conditioning is needed.



Insulate Hot Water Pipes

By insulating your pipes,
the amount of time used to heat water is reduced and less energy is used.

Over 10,000 gal/yr are wasted waiting for water to be warm enough for use.

Dimmer Switch

Controlling the amount of light used at specific times will reduce energy usage and increase the life of the bulb.

Dimming the light by 10% doubles the bulb life.

Check Light Bulbs

CFL's use 75% less energy than the standard incandecent bulbs.