

Do-It-Yourself Energy Audit for Congregations

A step-by-step walkthrough energy analysis to help you identify the **cost-effective, immediate** things you can do to:

Save energy

Save money

Protect creation



Kansas Interfaith Power and Light seeks to engage faith communities in environmental stewardship and sustainable practices through the promotion of energy conservation, energy efficiency, and renewable energy. We believe the threat of global climate change calls us to action.

Step One: Assessing

How do we currently use energy?

1. Contact your utility (gas and electricity) and ask them:

- To send you a year's worth of your congregation's energy usage data** in kWh, thousands of cubic feet (Mcf), etc. (instead of dollars - which fluctuate). Alternately, you can collect 12 months of bills on your own. This will help you to establish a baseline for energy use, and give you an idea of your seasonal energy usage patterns.
- If you are currently being charged the cheapest rates for which you qualify.** Your congregations' facilities may qualify for a lower rate than you are currently being charged!
- What energy efficiency programs are available for congregations** (which usually fall in the small or medium commercial rate class). Often, utilities will offer discounts on programmable thermostats, energy efficiency retrofits, and they may even have a professional energy auditor able to come and assess your facility at low or no cost.

2. Assemble your Energy Audit Team:

- Obtain the commitment of your congregation's leadership** to support an energy audit.
- Invite the congregation's facility manager, head custodian, staff,** or others who know the history and day-to-day operations of the buildings. Assign one person to lead the team and commit to following up with the results.
- Enlist the help of experts and professionals from your congregation.** Are there environmental engineers, heating and cooling experts, general contractors, etc. in your congregation?
- Invite the congregation's "green team"** or environmentally-concerned members to participate.

3. Do some background reading about energy efficiency in congregations to help stimulate conversation and ideas:

The EPA's Energy Star program has a very thorough resource for congregations, available for free download here: https://www.energystar.gov/index.cfm?c=small_business.sb_congregations

According to the EPA: Most congregations can cut energy costs by up to **30%** by investing strategically in efficient equipment, facility upgrades and maintenance.

30% less money spent on utilities = more money available for:

- mission trips
- charitable contributions
- important building upgrades
- religious education materials, etc.

Step Two: Take a Tour

Clipboard in hand, walk around the entire property with your Energy Audit Team. As you complete the walk-through assessment, be sure to take notes on what could be done in each room to reduce energy usage. Keep track of what you can do without professional help (like changing bulbs), and things you will need outside help with (like replacing windows).

	Sanctuary	Classrooms, meeting spaces	Kitchen/food service areas	Office Areas
Lighting:				
Type of lighting (compact fluorescent, T-4, T-5, T-8 or T-12 fluorescent, LED, incandescent)?				
Number of lights/room				
Estimated amount of time lights are used per day				
EXIT signs (incandescent or LED)?				
Heating and Cooling (HVAC systems):				
What is the age and efficiency rating of the heating and cooling equipment serving this room?				
Temperature settings (can they be set lower in the winter and higher in the summer)?				

	Sanctuary	Classrooms, meeting spaces	Kitchen/food service areas	Office Areas
Is the temperature set back when this room is unoccupied?				
Is there a programmable thermostat for this room?				
Are the fans set to "Auto" rather than "Fan"?				
What is the filter cleaning/changing schedule?				
Are all air intakes, diffusers, and fans unobstructed?				
Is the ductwork sealed properly?				
Water Use and Water Heating:				
What is the water heater age and efficiency rating?				
Current temperature setting of hot water heater (could this be reduced comfortably)?				
Are the water heater tank and pipes sufficiently insulated?				
Check for leaky faucets.				



	Sanctuary	Classrooms, meeting spaces	Kitchen/food service areas	Office Areas
Building Envelope and Windows:				
Inspect all doors and windows for air leakage. (Tip: hold a smoking stick of incense to see airflow).				
Do windows need caulking?				
Is there sufficient weather-stripping on doors and windows?				
How old is the insulation in ceilings and walls? Are there spaces to improve?				
Kitchen/food service areas:				
What is the energy consumption of kitchen appliances? (use serial and model numbers to research)				
Do refrigerator doors close and seal tightly?				
Can items be combined to disconnect unneeded fridges?				
Are the condenser coils on the fridge free of dust? Is there 3+ inches of space around the fridge?				



	Sanctuary	Classrooms, meeting spaces	Kitchen/food service areas	Office Areas
Are dishwashers used on efficient, low-water use settings?				
Business operations:				
Is the Energy-Save option enabled on all computers, copiers, etc?				
Are printers, fax machines, scanners, computers, and copiers EnergyStar rated?				
Is office equipment plugged into power strips (to reduce phantom load)?				
Safety:				
Security lighting: Are these on 24/7? Can timers/bulbs be changed?				
Have carbon monoxide detectors been installed on every floor?				

Step Three: Analyze Your Savings Potential

As you can see, there are myriad ways to save energy and save money in your congregation!

But you may still have important questions:

1. What behavioral changes can we begin TODAY?
2. What products and equipment will best increase our efficiency?
3. Which efficiency measures will pay for themselves in the shortest amount of time?

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These online calculators will allow you to compare pieces of equipment:

- The U.S. Department of Energy's site for building managers-
www1.eere.energy.gov/consumer/calculators/buildings.html
- The EPA's Energy Star Purchasing and Procurement site -
www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing
- The Dept. of Energy's Energy Cost Calculator for Fluorescent Lamps –
http://www1.eere.energy.gov/femp/procurement/eep_fluorescent_lamps_calc.html

Also, when you're ready to buy new equipment, remember to check out ShopIPL.org, where Kansas Interfaith Power & Light congregation-members can qualify for deep discounts on energy-efficient light bulbs, appliances, etc.

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The point of this audit is to help you identify inefficiencies in your building - in other words, opportunities to save money.

However, nothing can replace the advice and consultation of a certified energy professional. These certified energy raters can perform analyses of your building's performance and offer tailored, specific energy efficiency recommendations. In addition, many are energy service companies as well that can take you from analysis to retrofit in one easy package.

A list of Kansas auditors is available at the Kansas Interfaith Power & Light website.
www.kansasipl.climateandenergy.org



Step Four: No-Cost Changes

Lighting

- Place “turn off the lights” signs near all light fixtures.
- Assess if spaces are over-luminated for the activity that occurs in the space. Can some of the lights be disconnected?
- Assign specific people the task of turning off lights in the most critical areas (i.e. turning off the high energy-use sanctuary lights).
- Arrange furniture in a room to take advantage of natural lighting and reduce the need for artificial lights.

Heating and Cooling

- If the church has set-back thermostats, be sure they are set properly for room usage patterns. Manually set back ordinary thermostats when spaces will not be occupied. (Unoccupied spaces can be kept at 55° in winter and 85° in summer).
- Change the direction of fans to push warm air down in winter.
- Make use of blinds, shades, and drapes to manage heat gain and loss at windows.

Water Use and Water Heating

- Adjust the thermostat setting on all water heaters.
- Check for running toilets and leaky faucets.
- Set dishwasher to “low water use” setting.

Recommended water heater settings:

Hand Washing	105
Showers	110
Laundry	160
Dishwashing by hand	170
Dishwashers	180-195

Building Envelope and Windows

- Check caulking, seals, weatherstripping and insulation for readjustment or reattachment.

Kitchen/Food Service Areas

- Combine items in need of refrigeration, in order to retire inefficient refrigerators.
- Keep filters and air intakes clean on the refrigerator and other appliances.
- Set the refrigerator close to 37°F and the freezer to 3°F to conserve energy.
- Use a toaster oven or microwave for cooking, as they are faster and more efficient than ovens and slow cookers.

Business Operations

- Check that all office copiers, computers, and equipment are using the Energy Save options (i.e. copiers that cycle off after 5 minutes of inactivity)
- Turn power “off” on power strips.

Step Five: Investing in Efficiency

Lighting

- Replace incandescent light bulbs with compact fluorescent lamps or LED bulbs. (For each bulb you replace, you can save approximately \$15/yr in energy use and bulb replacement costs.)
- Replace T-12 fluorescent tubes and ballasts to the more efficient T-4, T-5, or T-8 sizes.
- Convert exterior lighting to high pressure sodium or metal halide lighting.
- Convert exit signs to LED (Each incandescent exit sign costs about \$30/yr to operate and maintain, while LED signs cost about \$5/yr.)
- Install occupancy sensors in rooms that are frequently unoccupied, and motion sensors where light is only needed when passing through (e.g. stairwells, landings).
- Install timers or photocells on outdoor lights.
- Install dimmer switches where dimmed lighting makes sense- every percentage you dim is a percentage you save in energy!

Heating and Cooling

- Install programmable thermostats.
- Seal leaks in ductwork and insulate the ducts.
- Follow maintenance schedules for your heating and cooling systems.
- Replace filters regularly.
- Buy an energy efficient central air conditioner. Look for a high seasonal efficiency rating (SEER).
- Buy an energy-efficient furnace that operates at greater than 90% efficiency.
- Landscape so that the sun enters south-facing windows in the winter, and provides seasonal shade and wind blocks.

Water Use and Water Heating

- Insulate your hot water heater and wrap the first 3 to 6 feet of hot water supply pipe with pipe insulation.
- Replace your existing water heater with an Energy Star rated one or a tankless, instant water heater. Consider relocating it closer to the source of use when replacement is necessary.
- Install faucet aerators and efficient showerheads.
- Find and repair leaks.
- Purchase dual-flush toilets and low-flush urinals.
- Install rain barrels to capture rainwater and reuse it for landscaping.
- Use native plants to reduce the need for water to be used for landscaping.

Building Envelope and Windows

- Install window film and shades, or replace older windows with Energy Star qualified double-paned windows and low-E glass.
- Install caulking and weather-stripping to leaky doors and windows.
- Re-insulate critical areas with a higher R-rated insulation.
- Obvious holes should be repaired, and any area that is un-insulated should be insulated.
- Install light-colored shingles to reduce heat absorption through the roof.

Kitchen/Food Service Areas

- Purchase Energy Star rated refrigerators, icemakers, dishwashers, etc.
- Install point-of-use hot water heaters for dishwashing sinks.

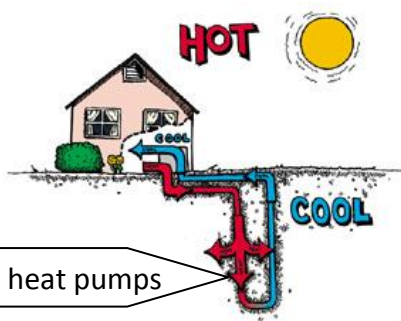
Business Operations

- Purchase Energy Star rated computers, copiers, faxes, etc.
- Use overhead task lighting to concentrate lighting where it is needed, and so background light can be turned off.
- Buy refilled/recycled printer cartridges instead of new ones.
- Buy recycled paper for office equipment.

Ready to REALLY save energy? Ready to be a serious energy steward?

CHECK OUT THESE GREAT IDEAS!

Solar hot water heaters



Geothermal heat pumps



Photovoltaic panels for solar energy

Wind turbines for wind power

