

SAVE ON HOT WATER

- Operate only one water heater until the need for an additional unit is proven. Operate the additional unit only when needed.
- Decrease the temperature of hot water used for washing hands to 110 degrees or eliminate it entirely.
- If domestic hot water requirements are met by circulating water heated by the furnace/boiler, install a free standing tank that may be operated independently from the furnace/boiler. Tankless water heater systems are very efficient in cold weather, but are extremely inefficient in mild or hot weather.
- If you need hot water for a kitchen, install a separate booster heater for the kitchen. Then install a switch to see that the booster is used only when the kitchen is operating. This saves energy in the kitchen and decreases heat loss from the pipes in the building's hot water system.
- If you have a dishwasher, make sure that it is maintained properly. Run only with full load to the greatest extent.
- Insulate exposed hot water pipes.

CLEAN-UP, FIX-UP, INSULATE

Every church and temple has a great deal of skill and knowledge in the members of the congregation. Draw on this pool of ability to help conserve energy. One way might be to organize an annual "Energy Clean-up/Fix-up Day." If members of your congregation do the work, energy savings from these projects will pay for the cost of materials in two years or less. The items near the top of the list will provide the quickest paybacks.

- Replace broken or cracked windows.
- Place a cover over the outside of window air conditioners to prevent cold air flow through the unit in winter. Remove the cover for summer operation of units.
- Defrost refrigerators, and clean the coils found at the back or underneath. Check the door seal. Replacement is needed if a piece of paper can be slipped between the seal and the cabinet.
- Clean heat exchange coils and fins found in heating and cooling units. (Dirt prevents heat transfer, and can cause heating or cooling units to run longer than necessary.)
- Caulk around window frames and door frames.
- Install weatherstripping on doors and operable windows. Don't forget doors or trapdoors leading to a roof or to an attic space. Examine caulking and weatherstripping regularly — even the best quality caulk will need replacing every few years, and weatherstripping on heavily used doors might need replacement annually.
- Install rigid insulation over windows in rooms not used very often, such as storage rooms, robing rooms, or sacristies. You can remove the insulation in the spring when you want to open windows and reinstall it in subsequent winters.
- In the furnace or boiler room, above false ceilings, in utility closets, and in areas used only occasionally, wrap with insulation

- all pipes and ducts that are warm to the touch. Ordinary construction insulation — 3½ inches of fiberglass with kraft paper backing — can be held on with wire, metal bands, or duct tape.
- Seal electrical outlets with inexpensive insulated gaskets that fit under the coverplate. Turn off the electricity, remove the plastic coverplates with a screwdriver, insert the insulated gaskets, reattach the plates, and turn the electricity back on. The gaskets are available for wall switches and convenience outlets in most hardware and discount stores. Electric wall sockets — unless plugged — can account for as much as 10 percent of cold air infiltration.
 - Install insulation on outside walls in storage rooms where appearance is unimportant. You might also consider installing insulation on outside concrete walls in lounges, study rooms, libraries, and clergy offices. Insulation here can be covered inexpensively with pegboard or bulletin board materials.
 - Install insulation on water heaters to cut heat loss. You can buy water heater insulation blankets or use faced batt or roll insulation. It is important to cut away the insulation over the thermostat plate covers at the front top and bottom of the electric water heater. This is a requirement of Underwriter's Lab. CAUTION: The top and bottom of a gas water heater should NOT be insulated.

THESE IDEAS ARE LAST

Religious organizations, like businesses, have a responsibility to make choices based on the most effective use of funds. Make sure you have done all the less expensive items before you consider the last two suggestions.

- Storm windows are useful if weatherstripping and caulking do not restrict infiltration. Otherwise the payback period is likely to be 5 to 10 years or longer.
- If, in order to install insulation, walls have to be torn down and then rebuilt, the project will be very expensive. Even blown-in or foam insulation will be expensive and have a long payback period.

To save more energy around your facility:

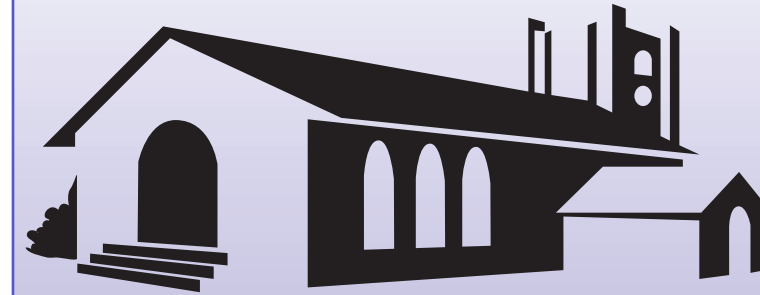
- **Develop a commitment to conservation.**
- **Keep all appliances clean and in good working order.**
- **If you're not using it, turn it off.**



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Consumer TIPS

Energy Conservation for PLACES OF WORSHIP



Save on your electricity costs...
USE ENERGY WISELY!

Take a systematic approach to energy savings. Many of the ideas listed in this brochure involve little expense or pay back the investment in a very short time. Your conscious efforts will help save energy and reduce electricity costs for your facility.



Time and Effort on Energy Management “Grow” Savings Dollars

- The single change that can reduce energy requirements the most is a careful program of scheduling — to provide the right amounts of heating, cooling, lighting, ventilation, and hot water at the right time and in the right places. Organize an “Energy Committee” to record when the building is occupied and by how many people. Then schedule meetings and building energy services only when needed.
- Encourage small groups to meet in homes, rather than at church or temple. Schedule building activities to reduce the number of times the temperature must be raised or lowered. For example, consecutive meetings will use less heat and cooling than meeting on separate evenings.
- Encourage people to use lounges for informal discussions, and not to stand in open doors when the building is heated or cooled. Encourage the use of small side entrances rather than a large main entrance.
- Look for windows that have been opened by occupants, and reduce the heating to those rooms.
- Open drapes to allow winter sun in, and close them at night.
- Educate your congregation about turning off lights and fans.
- Move desks, tables and chairs away from hot or cold outside walls and away from drafts.
- Establish, explain, and monitor all rules for building personnel regarding the opening and closing of doors. Doors between conditioned and unconditioned spaces should be kept closed unless they are needed for ventilation.
- Train your custodial personnel so that they can operate your cooling and heating systems. Then post a schedule of events for the coming week.

Turn Down - Turn Off

HEATING

- During the heating season, find out how low thermostats can be set without causing too many complaints. Most people can stand 68 degrees without discomfort, but some older people might demand that it be warmer.
- Encourage your congregation to dress warmer for church functions.
- When reducing room heating temperatures to 68 degrees, also reduce the speed of ventilation fans to eliminate cold drafts and complaints.
- Don’t heat unoccupied areas unless necessary to keep equipment from being damaged or pipes from freezing.
- Turn the temperature down to 55 degrees or lower when rooms are empty.

- The Energy Committee can assign members the responsibility of arriving at meetings or services early, to turn the thermostats higher. Try turning up the heat (from 55 degrees or lower) one hour before the auditorium is to be occupied and turning it down one hour before people are scheduled to leave. Then vary these times in 10 minute increments until startup and shutdown times are found that provide the desired level of comfort without costing energy.
- Programmable thermostats provide an excellent alternative to manual operation.
- Set thermostats in stairwells, hallways and vestibules as low as possible.
- If your building temperature is controlled by just one thermostat, you can save energy by providing space heaters in regularly used spaces such as the pastor’s or rabbi’s office, and then keep the temperature low in the rest of the building.
- Use spot heaters to warm personnel in areas having large volume but low occupancy, but don’t overload the electric circuits.
- Decrease the amount of cold air entering the building to a minimum during the heating season.
- Remove furniture, drapes or any other obstructions from in front of heating outlets or return air grills.
- If heating is provided by a hot water or steam radiator system, consider adding rigid insulation board on the wall surface behind the radiator. Heat loss through the wall is dependent on the difference in inside and outside temperatures. The insulation you choose should be noncombustible such as a fibrous board insulation. A reflective surface located between the radiator and the wall will increase the heating effect of the radiator by reflecting radiant heat into the room rather than allowing the wall to absorb the heat.

COOLING

- Cool only the spaces that are being used and only when they are being used. Don’t cool more than you have to.
- Control central chiller operation with a time clock.
- Eliminate leaks from air ducts.
- Operate one compressor at full load rather than two at partial loads. The efficiency of motors is higher at full loads.
- Provide thermometers to maintenance supervisory personnel for use in answering complaints about the temperature.
- Use outdoor air whenever possible to cool the building.
- In the summer, decrease the amount of hot air entering the building. Use night air when possible to cool the building and create a slight air pressure within the building.
- Turn on self-contained units, such as window and through-the-wall units, only when needed. Turn them off when space is to be unoccupied for several hours.
- Set thermostats to the maximum possible in summer, no lower than 78 degrees.

- Turn up thermostats to 85 degrees at night during the summer cooling season. But if this change causes the heating system to come on, use a lower temperature setting. The intent is to save energy, not waste it.
- Again, programmable thermostats provide an excellent alternative to manual operation.
- Cover all window cooling units during the heating season to prevent heat loss and drafts.
- Remove cooling units from vestibules, lobbies and corridors when practical.
- Eliminate unnecessary windows into cooled spaces. Boarding up windows and adding insulation can reduce the amount of sun-caused heat gain.
- In summer, keep the sun out by closing draperies, blinds or shades. This helps reduce the energy required to cool the building. Use draperies, etc. when possible.

VENTILATION

- Check size and speed of exhaust fans and limit to actual needs. The power requirements are proportional to the volume of air moved, so a 20-percent reduction in air volume will create a 50-percent reduction in power requirements.
- Regularly clean unit ventilators to permit more efficient operation.
- Weatherstrip or caulk all outside windows to reduce air infiltration.
- Install self-closing doors between conditioned spaces and unconditioned spaces.
- Rewire toilet room exhaust fans to operate only when lights are on.
- Consider closing outside air dampers, during the first and last hours of occupancy and during peak loads.
- Turn off humidifiers when a building is closed for extended periods of time, except when required by equipment or stored material.

Not Managing Your Heating and Air Conditioning Systems Is Like Blowing Money Out the Door

For religious organizations caught in the perennial budget squeeze, increasing maintenance might seem to be the wrong approach. But appropriate maintenance can reduce your overall operating costs by keeping equipment working at high efficiency, thereby reducing energy requirements and also reducing future repairs. Unless you can find members of your congregation willing and able to work for free, include funds for the following items.

- Annual servicing of air conditioning equipment, heat pumps and forced air furnaces.
- Regular air filter cleaning or replacement. On forced air systems, for example, filters should be replaced once a month.

- Periodic servicing of fans and pumps. Bearings should be lubricated and fan belts checked for wear and tension. An air handling motor running without its fan belt is using energy but not moving any air.
- Regular checks and calibration (at least every 4 years) of thermostats and other controls.
- Boiler servicing. Check internal surfaces of boilers for cleanliness and corrosion, and check fireside surfaces for soot. Boiler controls should be checked for correct operation. The water treatment should be checked. Gaskets should be installed on access doors. Insulation covering the boiler should be kept in good repair.
- Regular checks of all dampers which admit outside air.
- Record maintenance actions on or near the equipment maintained. Note what was done, when it was done, and who did it. Masking tape or a permanently mounted plastic sheet with a grease pencil will serve as local writing surfaces.
- Develop a preventive maintenance system that is easy to use for your heating and cooling equipment. Have cards for each week and cards for each item of equipment.

SAVE ON LIGHTING

In many religious buildings, the electricity needed for lighting could be reduced substantially, at very little cost. The Energy Committee should investigate the following ideas.

- Clean lighting fixtures at regular intervals to ensure maximum utilization of available lights.
- Check all light fixtures, to see whether some bulbs can be permanently removed. If fluorescent bulbs are removed, have the ballast disconnected also.
- When the supply of replacement fluorescent tubes runs out, order reduced-wattage tubes. Standard 40-watt tubes can be replaced by 35-watt tubes; these will cost a little more and will reduce light levels slightly, but will save about \$5 in electricity costs over the life of a tube.
- Replace 300-watt, silver-bowled incandescent bulbs (common in religious building meeting and study rooms) with 150-watt standard bulbs. An inexpensive (about \$3) “mogul-to-medium” adapter, available at hardware stores, will be needed.
- Change floodlights and spotlights to new elliptical reflector (ER) bulbs. ER bulbs can often reduce wattage by 50 percent, yet provide the same amount of light. These bulbs are particularly useful in sanctuaries.
- Check chandeliers, “boxed” lights and recessed ceiling lights to see if translucent panels can be removed. If so, reduced-wattage bulbs will provide the same light level as if panels were present.
- Check outdoor decorative and security lights to see if some can be removed. Where outside lighting is necessary turn it on with photo-electric cells and turn it off at a preset time. Inspect regularly to see that no lights are on during the day.

[Read on for more energy saving tips!](#)