

## APPENDIX A – ENERGY EFFICIENCY FOR GREAT NEIGHBORHOODS

### How to make your home more comfortable

Cold floors, drafts and high energy bills make winter unbearable. But the right improvements can ease the effects of cold and wind. Comfort depends on how your home, weather conditions and you interact. Learn how this interaction works. Then select projects that enhance winter comfort and reduce energy bills.

### Where the heat goes

Some heat is lost through the exterior of the house. Wall and ceiling insulation reduces the loss. Heat also escapes through air leaks. During cold weather, your house acts like a chimney. Heated air leaks out at the top and cold outside air leaks in at the bottom to replace it. Insulation won't stop these leaks. They must be properly sealed.

### Ventilation and air leaks

Proper attic ventilation prevents moisture buildup in the insulation and roof structure. Roof and soffit vents allow air to flow through the attic and remove moisture. Ventilation supplies fresh outside air to maintain healthy living spaces. Some ventilation systems are designed to pre-heat and pre-cool the air coming into your home. Fresh air for most homes is provided by air leaks. Unfortunately, the rate of air leakage can vary widely from season to season. Many homes have too much ventilation from air leaks in the winter and not enough ventilation in the spring and fall. The greatest air leakage occurs during the coldest temperatures and the highest winds. To prevent cold drafts and reduce energy costs, most new homes are tightly sealed. Ventilation systems exhaust stale air and control the flow of fresh air. Older homes are difficult to seal. A special device called a “blower door” locates hidden air leaks so they can be sealed.

To increase comfort, reduce energy use and enhance safety at home:

- Seal air leaks.
- Insulate to recommended levels.
- Maintain heating, cooling and water heating systems.

### Seal air leaks

The largest leaks often happen in unseen places:

- Through interior walls where the top plate is missing.
- Around chimneys and plumbing vent stacks.
- Where the inside edges of knee walls meet attic floors.

Blower-door testing helps locate hidden leaks and bypasses. Seal these leaks with caulking, sheet metal or densely packed insulation. Leaky ducts in a forced air heating system can also reduce comfort. These leaks can result in cold spots and rooms that are hard to heat. A contractor using a blower door and duct tester can locate and seal duct leaks. Ducts should be sealed with waterbased duct sealants or butyl-backed foil tape.

To conduct a blower-door test, a special fan is mounted in an exterior doorway. The fan draws air out of the house to simulate the effects of a strong wind. This makes air leaks easier to find and seal. Contractors measure the amount of air leakage and then locate and seal the hidden air and ductwork leaks.

## **Insulate**

Insulate after sealing large air leaks. Increase insulation levels to R-38 in the attic, R-11 in the wall cavities and R-19 in basement sillboxes. Walls and attics are important because they represent the largest surfaces for heat loss. Crawlspace and heated basements can also be insulated to improve comfort and save money. Contact MGE for recommended insulation levels, appropriate materials and installation techniques.

## **Maintain heating and cooling equipment**

Some conditions may cause a furnace or water heater to backdraft combustion gases into the house. Prolonged exposure to these gases can cause severe health problems. To prevent backdrafting problems:

- Have the furnace and water heater inspected regularly
- Have the furnace and water heater tested for backdrafting after any major remodeling.

Air conditioners should also be checked regularly to maintain efficiency.

## **ENERGY STAR® Products**

ENERGY STAR® labeled products use less energy than other products. They reduce your energy costs and help to protect the environment. Learn more about qualifying products at [www.energystar.gov](http://www.energystar.gov) or call the MGE Home Energy Line at 608.252.7117.

## **Home Performance with ENERGY STAR®**

Home Performance with ENERGY STAR® can help you increase your comfort and decrease your energy bills. It's offered by Focus on Energy, a statewide initiative to improve energy efficiency. MGE is a partner in Focus on Energy. A trained Home Performance consultant evaluates your home for a reasonable fee. The consultant discusses the evaluation and makes recommendations for energy-saving improvements. You get an unbiased analysis of your home's overall performance. Have questions? Call the Focus on Energy Information Center at 800.762.7077 or go to [www.focusonenergy.org](http://www.focusonenergy.org).

## **Home Energy Saver**

Use an online home energy audit to calculate your energy use and identify the best ways to save money. The Home Energy Saver was developed by Lawrence Berkeley National Laboratory. It is part of the national ENERGY STAR® program to help improve energy efficiency in homes. To try out an online energy audit go to: [www.homeenergysaver.lbl.gov](http://www.homeenergysaver.lbl.gov).

## **Visit MGE's Website**

MGE offers a library of energy information at [www.mge.com](http://www.mge.com).

## Energy Saving Tips

Incorporate as many of these specific energy saving tips as you can to make your home more comfortable and save money too.

Winter drafts	Benefit
Seal around sewer vent pipe in basement and attic. Use fireproof sealant around the chimney in attic.	Save on heating costs.
Replace missing storm windows or install inside plastic film.	Improve comfort and reduce condensation. Save 2% to 7%.
Keep windows tightly latched.	Improve comfort and security.
Use fireplaces only in the early fall or late spring when not using your furnace. Close the fireplace damper after the fire is out.	Save money and improve comfort. Prevent heat loss.
Cover wall-mounted air conditioners with plastic film or air-tight cover.	Reduce air infiltration.
Heating	Benefit
Keep the thermostat at 68°F or below.	Save on heating costs.
Lower thermostat at night and when you're gone (55°F lowest setting).	Save 1% during setback time period for every 1°F decrease in temperature.
<i>*If we all turn our thermostats back just one degree in the winter, we can save enough gas for 3,200 homes.</i>	
Wear warm clothes to stay comfortable at lower thermostat settings.	Improve comfort.
Check furnace filter monthly; replace as needed.	Improve furnace efficiency by increasing airflow.
Tune up heating system at least every other year.	Save money and improve safety.
Keep registers and cold-air returns clear of furniture and drapes.	Improve comfort and system efficiency.
Open drapes to allow sun in. Close at night.	Save money and improve comfort.
Cooling	Benefit
Set the thermostat to 78°F or higher.	Save 1% for every 1°F increase in thermostat setting when unit is running.
<i>*If we all reduced our air conditioner use by just 10%, we could save enough coal to fill 60 railroad cars.</i>	
Turn off the air conditioner when no one is home. Use a programmable thermostat for central air or a timer for room air conditioners to start cooling before you get home.	Save 17 to 44 cents per hour for central units. Save 8 to 17 cents per hour for room units.
Use a whole house fan, room fans or ceiling fans instead of air-conditioning. Room or ceiling fans can also allow you to be comfortable at a warmer air-conditioning setting.	Reduce cooling costs.
If buying a dehumidifier, look for an ENERGY STAR® model.	Save money.
Have air conditioner serviced.	Operate more efficiently.

Shade your windows: <ul style="list-style-type: none"> <li>• Close drapes, shades and blinds during the day.</li> <li>• Use reflective or white-backed shades on south and west sides. Exterior shading from awnings or trellises is even better.</li> <li>• Plant deciduous shade trees to the east, south and west of the home.</li> </ul>	Save money. Reduce heat from direct sunlight. Keep heat out of house.  Reduce cooling costs.
Cook outside or use your microwave.	Reduce cooling costs.
Change furnace filter every one to two months if you have central air.	Reduce cooling and dehumidification costs. Improve airflow.
Use exhaust fans to remove heat and moisture produced from cooking costs and showering.	Reduce cooling and dehumidification. Improve indoor air quality.
Keep registers and cold-air returns clear of furniture and drapes.	Improve comfort and system efficiency.
<b>Lighting</b>	<b>Benefit</b>
Replace the most-used incandescent with fluorescent bulbs and fixtures.	Use less than one-third the energy.
<i>*If we all take this step we can save 44 million pounds of coal a year.</i>	
Install solid-state dimmer switches for incandescent lights.	Save energy.
Use photo-eyes, motion detectors and timers to turn lights on and off. Turn lights off when not in use.	Keep your house cooler. 100 watts for 10 hours = 8 cents.
Replace halogen torchieres with ENERGY STAR® fluorescent torchieres. The 300- to 500-watt halogen bulbs can reach 1,000°F!	Save 2 to 4 cents per hour. Keep your home cooler.
Keep bulbs and fixtures clean.	Get more light.
<b>Appliances</b>	<b>Benefit</b>
Switch from an electric to a natural gas dryer.	Reduce drying costs by more than 55%.
<i>*If we all make the switch, we can save more than 60 million pounds of coal per year.</i>	
Cook in a microwave oven rather than stove.	Heat the food faster with less energy.
Use cold water to wash clothes.	Save 12 to 25 cents per load.
<i>*If we all take this step with every load, we can save 17 million pounds of coal per year.</i>	
If dryer is vented with plastic vent hose, replace with metallic vent pipe.	Reduce drying costs. Prevent dryer fires.
Run the dishwasher at night.	Reduce cooling costs and daytime humidity.
Wash a full load of dishes in the dishwasher.	Save hot water, electricity and detergent.
Use the dishwasher's air-dry or energy-saver cycle.	Save up to 8 cents per drying cycle.
Hang laundry outside to dry.	Save 8 to 11 cents per load for a gas dryer or 27 to 32 cents per load for an electric dryer.
Clean the clothes dryer lint trap after each load.	Dry faster and safer and save money.
Turn off TV, radio and stereo when not at home.	Save electricity and keep your home cooler.
Vacuum in the early morning or evening.	Save electricity and keep your home cooler.

<b>Refrigerator</b>	<b>Benefit</b>
When you're ready to buy a new refrigerator, purchase an ENERGY STAR® model.	Save money and energy.
<i>*If we all take this step, we can save more than 45 million pounds of coal per year.</i>	
Unplug second refrigerator if not needed.	Save \$5 to \$15 per month.
Defrost refrigerator when the ice gets over 1/4-inch thick.	Save energy.
<b>Water heaters, pools and spas</b>	<b>Benefit</b>
Replace shower heads made before 1994.	Save water and reduce water-heating costs.
Set water heater at 120°F to 125°F.	Save money and prevent scalding.
Insulate pre-1990 water heaters, especially electric.	Recover the cost in six months.
Fix leaky faucets. Use faucet aerators.	Save water and energy.
Insulate the first 5 feet of cold water pipes and all hot water pipes. Start 3 inches above the vent opening.	Use precut tubes, it's easy, and payback is less than five years.
Turn water heater control down to vacation or pilot setting when gone for two or more days.	Save about \$4 per week.
Use a pool cover.	Cut heat loss 70% to 90%.
Keep pool heater thermostat at lowest comfortable setting.	Save money.
Operate pool and spa filters 10 to 12 hours per night on a timer.	Cut filtration energy cost in half.
Convert electric pool heater to natural gas or solar.	Cut cost by 50% or more.
<b>Major appliance purchases/remodeling</b>	<b>Benefit</b>
Replace refrigerators manufactured before 1990 with new ENERGY STAR® models.	Save \$70 to \$135 per year.
Insulate and ventilate attic. Insulate walls.	Save money and be more comfortable.
Purchase an ENERGY STAR® air conditioner.	Save energy and money.
Choose a natural gas range instead of an electric one.	Save energy and money.
<i>*If we all take this step, we could save 27 million pounds of coal per year</i>	
<b>Home office equipment</b>	<b>Benefit</b>
Buy ENERGY STAR® monitors, printers and computers. Use low-power features.	Save money and reduce heat produced.
Shut off equipment that's not in use.	Save money and reduce heat produced.
Use energy-efficient lights.	Save money and reduce heat produced.