

# Carbon and home energy use

## FACTS ABOUT...

carbon and home energy use

- Energy used in Wisconsin homes is responsible for about a quarter of all CO<sub>2</sub> emissions in the state.
- The average single-family Wisconsin home is responsible for about 18 tons of CO<sub>2</sub> emissions per year—three times the amount produced by the average automobile in a year.
- Two-thirds of all residential CO<sub>2</sub> emissions come from electricity consumption.
- Single-family, owner-occupied homes represent three-quarters of all residential CO<sub>2</sub> emissions.

## APPROACHES...

reducing carbon emissions from home energy consumption means addressing many end uses using a variety of strategies:

**A** Appeals for energy conservation

**V** Voluntary programs to promote more efficient use of energy

**C** Codes and standards that require energy efficiency

**N** Proving and deploying new technologies

### SUPER-SIZED HOME CONSTRUCTION

- A** New Wisconsin homes are about 25% more efficient for heating and cooling per square foot, but are also about 25% larger: we've traded in energy and carbon savings for larger homes. Can home buyers be persuaded to de-supersize?
- V** Wisconsin ENERGY STAR Homes emit 4% less carbon than other new homes due to tighter construction and better insulation. Increased energy efficiency codes for new construction could capture these savings for all new homes. Super-insulated homes can dramatically lower heating and cooling loads.
- C**

### BUTTONING UP FOR CARBON REDUCTION

- V** About a third of single-family older homes in Wisconsin are inadequately insulated or excessively leaky. Correcting these deficiencies would reduce aggregate residential carbon emissions by about 3%.

### LIGHTING THE WAY TO CARBON REDUCTION

- V** Replacing all incandescent lighting with compact fluorescents (CFLs) would reduce residential carbon emissions by about 6%. Prices have dropped and selection has increased, but CFLs still suffer from the poor reputation of the earliest generation. The current WI market share for CFLs is about 14%.
- N** LED technology promises dramatically better efficiency and longer life, but good-quality white LEDs are still expensive and less efficient than fluorescent.

### PUTTING THE CHILL ON CO<sub>2</sub>

- C** Increasingly stringent federal standards mean that a refrigerator purchased today uses only about 1/2 the electricity of a new refrigerator in 1980.
- A** One in five single-family homes in Wisconsin has two refrigerators: could some of those be retired to reduce carbon emissions? Eliminating all second refrigerators in Wisconsin would reduce residential carbon emissions by 1%.

### GADGET CREEP

- V** Electronic devices are fast proliferating in Wisconsin households, but accurate data on their aggregate electricity consumption do not exist. Many of these use standby electricity 24/7. Can gadget creep be fought? Can consumers and retailers be steered toward models that use less electricity? Should Wisconsin join other states, and adopt efficiency standards for electronic appliances, or is this the job of the federal government?
- C**
- A**

### SPACE HEATING AND GLOBAL WARMING

- V** Wisconsin leads the nation in market share for high efficiency furnaces, thanks to past rebates by utilities and promotion in low-income weatherization. Nine out of 10 furnaces sold in the state are high efficiency models.
- V** Variable-speed furnace fans can dramatically reduce electricity consumption by gas furnaces, for a 4% reduction in home carbon emissions. Rebates in the last several years have pushed the market share for this technology to about 25%.
- N** In-home co-generation uses natural gas to produce electricity and heat for space heating with less than half the carbon emissions of conventional systems. Products are just coming on the market.
- A** More than half of homeowners already set back the thermostat at night (only about a quarter of renters do so). If all Wisconsin households set back by at least 5°F overnight, residential carbon emissions would go down 1%.

### CARBON IN HOT WATER

- V** Most gas water heaters are only about 55 percent efficient. High efficiency conventional models are just entering the market, and tankless models promise lower stand-by losses.
- A** About a quarter of Wisconsin homes have their hot water set at 135°F or higher—can these homeowners be convinced to turn down the tank temperature a bit to save about 1% on carbon emissions?
- V** Existing simple technology can recover about half of the heat that otherwise goes down the drain when showering—but the current payback is fairly long for most homes. This technology could reduce total carbon emissions from homes by 2%.

