

# Savings Analysis Worksheet

## Programmable Thermostats

### Opportunity

Large buildings save energy by using Energy Management Systems (EMS) to control heating, ventilating and air conditioning (HVAC) equipment and other systems. EMS's can control multiple pieces of equipment on complex schedules using sophisticated programs. Smaller facilities can also save on their HVAC energy use by using programmable thermostats to control building temperature.

### Action: Install programmable thermostats

### Thermostats

Thermostats typically control building temperature within a relatively narrow band. When the temperature in the room or space moves above or below that band, the thermostat activates the cooling or heating system. Programmable thermostats allow the building operator to vary the building temperature automatically based on building use. By setting the temperature back during unoccupied periods (referred to as the setback temperature), summer cooling energy and/or winter heating energy can be reduced.

While a variety of kinds and brands of programmable thermostats are available, they can be classified into one of the following three types.

**Electro-mechanical thermostats** use an electric clock and a series of pins or levers to control temperature. This is usually the least expensive option. They are easy to operate but have limited flexibility.

**Digital thermostats** are also easy to use. They offer more flexibility to tailor settings to differing schedules for different days of the week and allow for more than two set points per day.

**Occupancy sensor thermostats** maintain the setback temperature until triggered by a person entering the controlled space. The trigger mechanism can be a switch, button, light or motion sensor.

### Savings/Economics

Programmable thermostats range in cost from about \$25 to well over \$100, depending on the type and the level of flexibility desired. Savings estimates depend on many factors: the amount of setback, the length of the setback period, and the age and condition of your present system. A rough rule of thumb is one percent savings in energy costs for each degree of setback temperature per eight hour period per day.

For example, an office currently maintains a constant thermostat setting of 68°F. By reducing the setting to 64°F during the unoccupied hours of 7 p.m. through 7 a.m. Monday through Friday and all day Saturday and Sunday, the building's energy cost should decrease by eight percent.

### More Information

You can use the worksheet to gain an understanding of the savings potential. Consult with your HVAC dealer for a more precise estimate on prices and savings for your situation. For names of thermostat control professionals in your area, fact sheets on other energy saving opportunities, and more information on the Focus on Energy Program, call 800.762.7077 or visit our Web site at [focusonenergy.com](http://focusonenergy.com). Information in this fact sheet was derived from the ENERGY STAR® Small Business Guide published by EPA and other sources. For further information on the ENERGY STAR Small Business Program, visit [www.energystar.gov](http://www.energystar.gov) or call Focus on Energy.

### Estimate Your Savings

Using the chart below, you can estimate the savings you could realize by installing programmable thermostats in your building:

1. Enter the approximate square footage of your building.
2. Enter the number of degrees of temperature setback.
3. Enter the average number of hours of temperature setback each week.
4. Enter your average natural gas cost (from your gas bill). If you don't know what it is, enter \$0.50.
5. Calculate your current annual operating cost based on the formula in the chart below.

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1) Building Sq. Footage	Heat Factor (Therms/Sq Ft/Yr)	2) Degrees of Temp. Setback (70°F to 65°F = 5°F)	3) Hours per Week of Setback		4) Gas Rate (Use \$0.50 as default)	5) Annual Savings
	x .05	x	x	÷ 5600	x	=