

# KEEPING YOUR COOL



The way you cool your home in the summer can make a big difference on your utility bill. You don't have to sacrifice comfort for energy savings. First, implement the no cost tips, then work on keeping the heat out. When you need additional cooling, examine some of the cooling alternatives before turning on your air conditioner. The typical air conditioning bill in Iowa is about \$300. Most households could cut bills in half with the following tips.



## KEEPING YOUR COOL

This list of no cost tips can make you feel more comfortable and help you keep more money in your pocket:

- Schedule heat producing tasks like baking, vacuuming, and ironing for the early morning or late evening.
- Keep unnecessary lights and appliances turned off.
- Wear lightweight, light-colored clothing made of natural fibers.
- Use bath and kitchen vents to exhaust heat and moisture.
- Plan cold meals with salads, etc.
- If you are going to cook, use appliances that don't produce much heat such as microwaves, crockpots, frying pans, etc. Or enjoy the outdoors and barbeque.
- Try to use as little hot water as possible. It adds heat and humidity.
- Close your windows early on hot days and open them in the evening to capture the cool breezes.
- Close your drapes on hot sunny days, especially the east and west drapes.
- If your basement is livable, temporarily move downstairs on hot summer days. It can often be 10-15 degrees cooler than upstairs.
- Turn on your furnace fan to bring some of the cool basement air upstairs.

- Make sure your clothes dryer is vented outdoors. You don't need the heat or humidity. Or use your "solar clothes dryer", the clothesline.
- Turn off the pilot light on your furnace. This saves gas and heat. And, since gas produces moisture when it burns, leaving it on can cause additional rust to build up in your heat exchanger. Ask a dealer how to turn off and relight pilot lights. Pilot lights on most gas appliances such as stoves, dryers, etc., contribute to the cooling load. Shut off unnecessary pilot lights and light by hand when needed.
- Drink plenty of liquids.
- Keep both primary and storm windows closed when air conditioning.

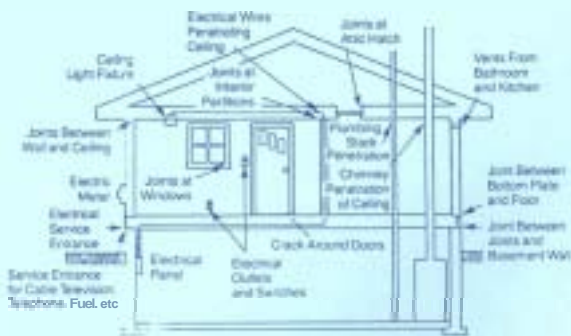
## KEEP THE HEAT OUT

Before you begin to look at ways to cool your home, you need to do everything you can to keep the heat out. Most of the things that keep your home warm in the winter also keep it cool in the summer.

### Caulking and Weatherstripping

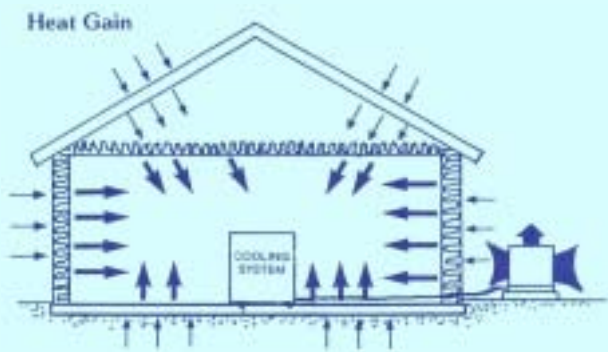
The average home exchanges all its air with outside air once every hour to hour and a half. This means that your air conditioner and furnace must cool and heat more air each hour. Any house tightening that you can do can lower both your heating and cooling costs significantly. The Energy Hotline has information on house tightening.

#### Areas Where Air Leakage Occurs



## Insulation

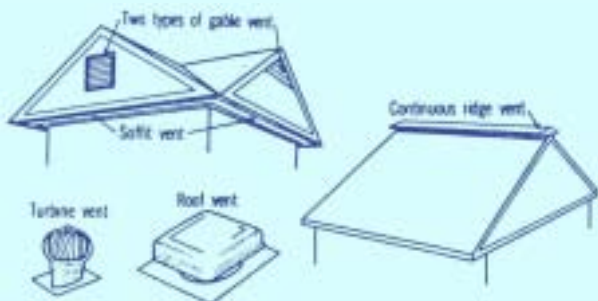
House tightening slows air leakage, but you need insulation to slow heat transfer. Your house should have **R-30 to R-40** in your attic, your walls should be fully insulated, and don't forget your basement walls and band joist area. The Energy Hotline has more information on recommended R-values and attic, wall, and basement insulation.



## Attic Ventilation

If your attic is well insulated and the holes between the attic and the interior space have been sealed, attic ventilation is less important. Good attic ventilation doesn't hurt though. Try to use passive ventilation instead of power vents. Power vents usually consume more energy than they save and can literally suck your conditioned air up through the holes in the attic floor. The recommendation for passive ventilation is one square foot of ventilation space for **150** square feet of attic space. See the publication "Control Moisture with Ventilation and Vapor Barriers," for more information on attic ventilation.

## Common Vent Types

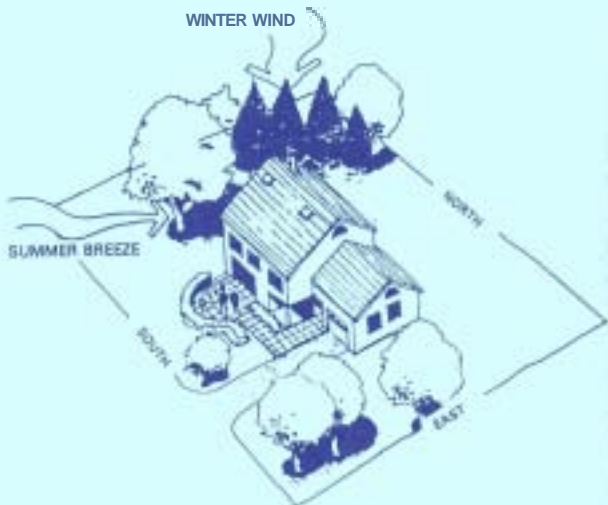


## Landscaping

The type and location of trees can have a significant impact on your summer cooling. Trees that lose their leaves in the winter should be located on the east, south, and west. These trees shade well and also cool as moisture evaporates from their leaves. If you do not have many trees in your yard, start by planting them on the west side of the house first where they will give you the most benefit in the summer. Trees on the south should be tall and slender with the east and west trees shorter and wider.

Shrubs and vines around the house also provide good shade. Vines grown on the house or on a trellis on the east and west sides of the house help in the early morning and later afternoon.

## Landscaping For Energy Efficiency



## COOLING ALTERNATIVES

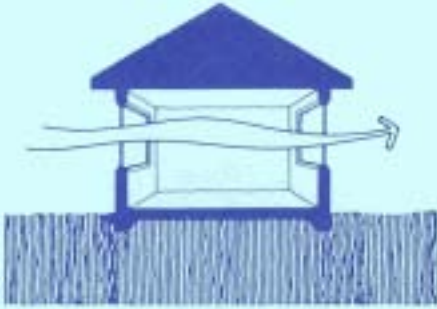
### Hold in the Coolness

Open windows at night and allow the cool night air to cool off the house. In the morning, close up the house and trap the cool air in. This method works most nights except when it is extremely hot and humid. On those nights, adding the humidity without the coolness will cause the air conditioner to work harder to dehumidify the next day. The house should be tight and well insulated to work effectively.

## Cross Ventilation

Often opening windows on the north and south will allow a cooling breeze to pass through. This breeze is often sufficient to avoid running the air conditioner.

### How Cross Ventilation Works



## Portable Fans

Portable fans cool in two basic ways: by circulating air within a room to evaporate moisture from your skin and by ventilating the air in a room. If it is hotter outside than it is inside, don't bring in hot outside air. Rely on the portable fan to circulate air within the room. If it is cooler outside than it is inside, bring in the cool outside air.

To cool one room or small space quickly, set a box or window fan in the window to blow the cool outside air in. To cool several rooms, open the windows in the rooms you desire to cool and set the box or window fan in a window on the other side of the house to exhaust hot air to the outside. This will bring in cool air to the rooms with their windows open. Close the doors to rooms that don't need cooling. The window farthest from the fan should be open the most.

### Portable Fans



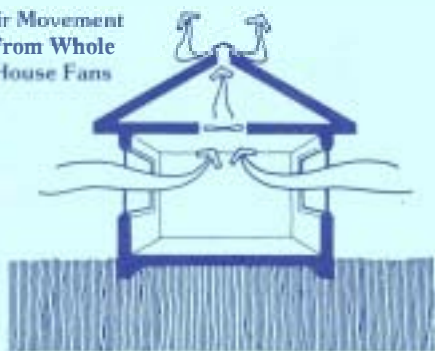
**Ceiling Fan**



## **Ceiling Fans**

Ceiling fans can save energy in the summer by creating a cool breeze that may be just enough to keep you from needing the air conditioner. The ceiling fan cools you in the same way as circulating portable fans. The air movement over your body evaporates moisture and has a cooling effect. Ceiling fans save energy in the winter only if there is a significant difference between ceiling and floor temperature. This seldom occurs in a house with a forced air furnace. Ceiling fans used during the winter can create a draft that can cause you to turn up your thermostat to feel comfortable.

**Air Movement  
From Whole  
House Fans**



## **Whole House Fans**

Whole house fans are mounted in the ceiling in the middle of the house. They draw cool outside air into the house through open windows and exhaust the hot inside air out through the attic. Whole house fans are effective only when it is cooler outside than it is inside. If you size a whole house fan to also cool the occupants by creating a breeze, you will be wasting energy. Ceiling fans will do this with much less energy usage.

You must have an easy way of closing off the hole for the whole house fan for the winter or you could lose more energy than you save in the summer.

The fan should be sized to create about 30 air changes per hour. You should open windows equal to twice the size of the fan area.

## Window Treatments

Sun shining through your windows can provide passive solar heat in the winter time, but in the summer it can add unwanted heat. The primary solar gain in the winter comes through south windows because the sun is lower in the sky. But in the summer, very little solar heat enters south facing windows due to the high angle of the sun. In the summer the sun comes in the east windows in the morning and the west windows in the late afternoon. It only takes 72 square feet of west facing window to require another ton (12,000Btus) of air conditioning capacity. Overhangs do not help on these sides, so other shading devices must be considered. Shading on the outside is the most effective.

### Exterior Shading Options



### Exterior Options

**Bamboo Curtains** are effective window shading devices, but are vulnerable to wind damage. Light colors reflect more sunlight than dark colors.

**Solar Screens** cut the amount of heat entering the window but allow visibility. They are usually made of woven vinyl-covered fiberglass and look like a standard window screen.

**Exterior Shutters** are normally decorative only. Those that aren't are usually opened and closed from the outside. Exterior rolling shutters are available that can be operated from the inside and also provide security.

**Awnings:** should be light-colored to reflect the sunlight and vented at the top to prevent heat buildup beneath the awning. They are to be used primarily for east and west windows. A retractable awning will allow solar gain in the winter.



## Interior Shading Options



BLINDS



DRAPES

### Options

**Draperies** Draperies help, but are not nearly as effective as exterior shading. The heat is already in the house by the time it hits the drape. If the drape is sealed to the wall at the sides and extends from the floor to ceiling, it is a much better insulator. Don't block the registers.

**Venetian Blinds** like drapes, do not seal tightly and consequently allow the hot air accumulated behind the blind to flow into the room. A shiny surface will, however, reflect some sunlight back through the glass. Lighter colors reflect more heat.

**Window Films** are usually designed to reflect sunlight back through the windows, so use these films on east and west windows. Some films have insulating qualities that reflect radiant heat, raising the insulating value of the window. These insulating films are the only ones that have significant energy savings in the winter.

Window films vary in color and solar reflectance. Most reduce solar transmittance about 75%. They have additional benefits such as reducing the fading of rugs and upholstery, reducing glare, and can prevent windows from shattering, increasing safety and security.

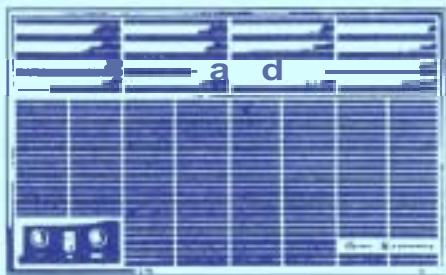
Solar reflective films on south windows greatly reduce the natural passive solar gain that helps heat your home in the winter. Any savings in the summer would be lost in the winter. For more detailed information on window films, contact the Energy Hotline.

## Dehumidifier

The dehumidifier is not really an energy saver. Actually, it's a large energy user. Its main purpose is to keep the humidity down in the basement so that mold and mildew don't ruin the furnishings. It actually adds heat to the house, but in the moderate months, in a cool basement, this usually isn't a problem. If you have a central air conditioner, it will dehumidify the air as it cools and you don't need to run a dehumidifier.

When you're not running your central air and need a dehumidifier, buy one with a humidistat. Set the humidistat to run the dehumidifier as little as possible, while still keeping the basement dry. If the humidity is low outside, shut off the dehumidifier, open the basement windows and use a fan to draw in the fresh air.

## Room Air Conditioner



## AIR CONDITIONING

Air conditioning costs can vary within the same region. Factors that effect the amount of time that you need to run an air conditioner include:

- 1) The tightness of your house. (A leaky house lets in hot air and humidity which makes your air conditioner work harder.)
- 2) The level of insulation in your house.
- 3) The amount of east and especially west glass in your house and how well the glass is protected.
- 4) Your tolerance to heat.
- 5) Alternatives and how they are used.

## Energy Guide Label

Room Air Conditioner  
Capacity: 8,000 Btu/h

(Sigma of Corporation)  
Model No. SA-216, 10A, 11B

# ENERGYGUIDE

Models with the most efficient energy rating number use less energy and cost less to operate.

Models with 1000 to 1200 Btu/h cost about the same as this.

Least efficient model: **3.4**

**7.3**  
THIS MODEL

Most efficient model: **8.5**

This energy rating is based on U.S. Government testing.

**How much will this model cost you to run yearly?**

Yearly hours of use	200	350	1000	2000	3000
Assumes electric cost of 10¢ per kilowatt-hour					
Cost per kilowatt-hour	\$17	\$29	\$87	\$174	\$261
Cost	\$57	\$102	\$870	\$348	\$783
Cost	\$27	\$82	\$708	\$216	\$324
Cost	\$14	\$45	\$378	\$171	\$408
Cost	\$43	\$132	\$110	\$324	\$483

Ask your salesperson or local utility for the energy rate (cost per kilowatt-hour) in your area. These costs will vary depending on your local energy rate and how you use this product.

**Important:** This number is the total before tax. It is based on a standard test procedure (ASTM 108-70).

(Part No. 20040)

## Room Air Conditioners

Room air conditioners usually have lower initial costs and lower operating costs than central units. They can cool one room or a zone within the house. Zone cooling can have a significant energy savings compared to central air conditioning. If a person is looking for a less expensive way to keep cool, and can live with just a couple of rooms cooled, then the room air conditioner would be the best choice. If they want to cool the whole house, a central unit is more convenient than one large room unit or several room units.

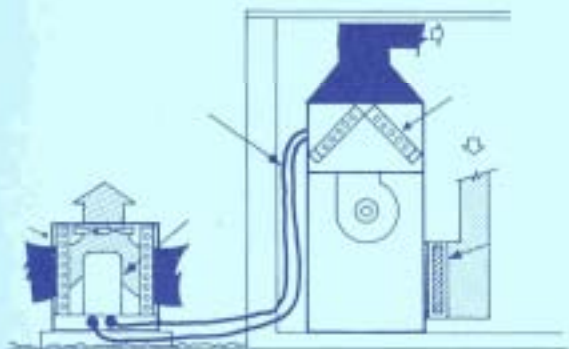
Energy efficiency is measured in terms of EER (Energy Efficiency Ratio). The higher the EER, the more efficient the air conditioner. Most older room air conditioners have EER's of 5 to 6. If you are buying a new unit, something in the EER range of 8 to 10 would be appropriate. Higher EER's are available and may be justified if the unit is used extensively or if you have high electric rates. For more information on calculating savings from air conditioner replacement contact the Energy Hotline.

## Central Air Conditioning

Central units should be carefully sized. It is better to undersize a unit than to oversize it. An oversized central air conditioner would not run as long to cool the house and would not effectively dehumidify. You might set the thermostat lower to feel comfortable and spend more energy. A unit that is properly sized or slightly undersized would cool and dehumidify for the least cost.

Central air conditioner energy efficiency is measured in SEER (Seasonal Energy Efficiency Ratio). It is similar to the room air conditioner's EER, except that it indicates the average efficiency over the cooling season. As with the EER, the higher the SEER the more efficient the unit. Central units are available with SEER'S of up to 15. Weigh the amount of use and your electric cost to determine which is the best unit for the money. For the average home, a SEER of 9 or 10 would be appropriate. For more information on sizing and savings calculations from replacement, contact the Energy Hotline.

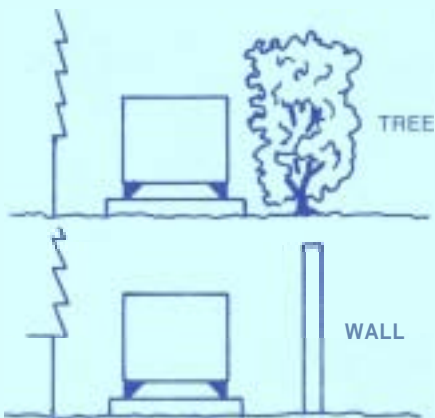
### Central Air Conditioner



The following are operating tips for room and central air conditioners. Some do not apply to both:

- Clean the unit before each cooling season. (See manufacturer's instructions).
- Set the thermostat at 78 degrees. Each degree higher the temperature is set saves approximately 6 percent on air conditioning cost.
- Don't turn the thermostat lower than the desired setting. The house will not cool off any faster and will overshoot the desired temperature, wasting energy.
- If your home is unoccupied during the day, you will save energy and money if you turn off your air conditioner and leave your home closed up. It may stay cool all day. If not, and you don't like coming home to a warm house, purchase a clock thermostat to turn on the air conditioner to cool your home before you arrive.
- Don't run your air conditioner all night if it is cooler outside than inside. Open the windows and use the fan.
- Provide shade for the outside compressor if it is not already shaded by the house or trees.
- Keep grills and heat exchangers clean and filters frequently changed.

### *Shading Outside Compressor*



## COOLING ALTERNATIVE COSTS

Cooling Options	Typical Wattage	Cost/hr <sup>1</sup>
Circulating Fan	88	.01
Ceiling Fan	55	.01
	100	.01
Box or Window Fan	200	.02
Wholehouse Fan	300	.03
	500	.05
Window Air Conditioner <sup>2</sup>		
5000 Btu/hr EER = 6	833	.08
5000 Btu/hr EER = 9	555	.06
12000 Btu/hr EER = 6	2000	.20
12000 Btu/hr EER = 9	1333	.13
Central Air Conditioner		
24000 Btu/hr SEER = 6	4000	.40
24000 Btu/hr SEER = 9	2667	.27
36000 Btu/hr SEER = 6	6000	.60
36000 Btu/hr SEER = 9	4000	.40
48000 Btu/hr SEER = 6	8000	.80
48000 Btu/hr SEER = 9	5333	.53

<sup>1</sup>Cost is figured at \$.10/kwh. Your cost may vary.

<sup>2</sup>Both window and central air conditioners have been calculated under continuous operation. Under normal conditions, they will cycle on and off according to outdoor temperature. The cooler it is outside, the lower the cost/hr will be.

Try to use the cooling methods that require little or no energy before air conditioning. Again, you don't have to sacrifice comfort for energy savings. If you follow these tips you will be rewarded with lower electric bills while staying cool and comfortable.

Contact the Energy Hotline 800-532-1114 throughout the state of Iowa, or 281-7017 in Des Moines, for more information on the different subjects in this publication.

Additional information is available to Iowa homeowners on most energy topics, including:

**No Cost Low Energy Tips**  
**House Tightening**  
**Insulation**  
**Heating Systems**  
**Appliances**  
**Windows**  
**Active and Passive Solar**  
**Energy Efficient Construction**

The Energy Hotline, Capitol Complex, Des Moines, Iowa 50319. (800) 532-1114 or (515) 281-7017.

**DIVISION OF ENERGY  
AND  
GEOLOGICAL RESOURCES**

**IOWA DEPARTMENT  
OF NATURAL RESOURCES**

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