



**Minka Cirque**  
54 in., \$525

# The Facts About Ceiling Fans

Choose a good-looking, energy-efficient fan, and use it correctly

BY PATRICK McCOMBE

**T**here are 16.7 million ceiling fans sold every year in the United States. They are so popular that most homes have three or more. Most people say that they use their fans to stay comfortable and to save on air-conditioning and heating costs. People also routinely say that the fans keep their homes cooler. These widely held beliefs about ceiling fans are far less straightforward than most people realize.

When used incorrectly, ceiling fans actually can add to your utility costs instead of reducing them. The good news is that if you understand how ceiling fans work and know how to pick the proper fan for a space, these devices can indeed make you more comfortable and save you money on your utilities.

The first thing to know about ceiling fans is that they cool people, not rooms. Like all fans, ceiling fans make you feel more comfortable on a hot day because the breeze they produce speeds the evaporation of sweat from your skin. This evaporative cooling doesn't work on inanimate objects or air, so leaving a ceiling fan running in an unattended room won't help cool the space. You should always turn off ceiling fans when nobody is in the room.

When you're in the room, ceiling fans can save you money on your air-conditioning costs in two ways. For starters, they can keep you comfortable on days with less intense heat, allowing you to resist turning on the air conditioner. Since a typical ceiling fan uses about 100w on high speed, compared to a central air conditioner's 2000w to 5000w, the

# HIGH STYLE

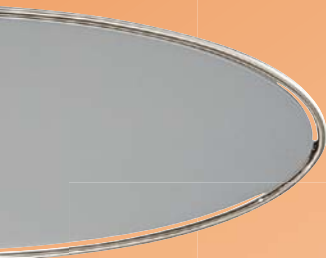
It used to be that all ceiling fans looked like they came from the set of *Casablanca*, but times have changed. Now you can get fans in virtually any finish and blade configuration. Some models are meant to go unnoticed, while others are meant to be showpieces. There are even fans with hidden and asymmetrical blades.



**Fanimation Beckwith**  
13 in., \$500



**Fanimation Brewmaster Long**  
56 in., \$1767



**Kichler Link**  
54 in., \$558



**Fanimation Enigma**  
60 in., \$1200

energy savings are easy to calculate. By setting your air-conditioning thermostat a few degrees higher on the hottest days, you can use the fan to stay comfortable. These savings are harder to document.

A 1996 research project conducted by the Florida Solar Research Center found that Florida homes using ceiling fans had the same thermostat settings as Florida homes without ceiling fans. If we assume that the homeowners with fans accurately reported their fan use and their thermostat settings, we have to assume that they were using the fans without adjusting the thermostat. As a result, their ceiling fans weren't helping to save energy. Moreover, the rooms where the fans were located actually were warmer, since the motor in a ceiling fan can be as hot as 100°F at full speed.

Saving on cooling costs with a ceiling fan simply comes down to occupant behavior. If you can be comfortable with a higher thermostat setting while running the fan, you will save money because the fan uses less electricity than air-conditioning. Just be sure to turn the fan off when you leave the room.

## Winter savings remain unproven


Fan manufacturers and some who offer advice on saving energy recommend running ceiling fans in the winter, too. The theory is that by running in reverse, the fan mixes the warm air that's close to the ceiling with the cooler air close to the floor but doesn't produce a breeze felt by the room's occupants. Theoretically, this allows you to




**Minka Rainman**  
54 in., \$460

# OUTDOOR OPTIONS

Outdoor fans, which are built with rust-resistant housings and hardware, create a welcome breeze to keep you cool and keep the bugs away. Damp-location models are made for protected areas such as covered porches and patios. Wet-location models have sealed housings and weather-resistant blades that make them safe in unprotected locations such as pergolas.



**Kichler Canfield Climates**  
52 in., \$326



**Kichler Lehr Climates**  
80 in., \$700

keep the thermostat at a lower setting. Unfortunately, energy saving from wintertime fan use hasn't been researched.

Jonathan Coulter, an efficiency expert at Advanced Energy in Raleigh, N.C., recommends doing your own testing over a few days to see if running the fan in the winter can save on heating costs in your home. He suggests lowering the thermostat about 5°F and running the fan on low speed, then trying the same thermostat setting with the fan off. If the fan helps you stay comfortable with a lower thermostat setting, you should use the fan because it uses less energy than running your heating system.

If using the fan doesn't help you stay comfortable with a thermostat setting that's 5°F lower, try a thermostat setting that's lower by only 2°F, and repeat the test with and without the fan. If the fan still doesn't help you stay comfortable, return the thermostat to its original position and leave the fan off.

Keep in mind that there are some conceivable drawbacks to running a fan during colder weather. According to Coulter, the first problem is that the fan creates a breeze that makes occupants feel

cold, so they turn up their thermostat in response, increasing their energy consumption. In addition, homes with a lot of warm air at ceiling level generally have other problems, such as poorly designed heating systems or large air leaks that contribute to air stratification. Solving those problems first will save more energy and provide greater comfort than running a ceiling fan.

Coulter does point out that homeowners who use wood-burning and pellet stoves for heating can sometimes be more comfortable running ceiling fans as a way to distribute the hot air that collects close to the stove. But he adds, "The air around the stove is often about the same temperature as body temperature, so the fan's breeze may make you feel colder than you would without it." Once again, he suggests experimenting in order to know how running the fan affects comfort.


## Match the fan to the room

Ceiling fans range in size from 3½ ft. to 7 ft. or more. Recommendations vary from manufacturer to manufacturer, but there are general guidelines on how big a fan should be for a given space. Rooms





**Fanimation Bayhill**  
56 in., \$700



**Hunter 1886**  
60 in., \$500

## PERIOD DETAILS

Nothing kills the look of period-appropriate decor faster than the wrong fan slapped in the center of a ceiling. Fortunately, there are ceiling fans available to match most architectural periods. Manufacturer websites and lighting showrooms are the best places to get help in matching a fan to an architectural style.



**Fanimation Bayhill**  
56 in., \$550

that are 90 sq. ft. or less should have a 42-in. fan. Rooms from about 90 sq. ft. to 100 sq. ft. require a 44-in. to 46-in. fan. Rooms that are 100 sq. ft. to 150 sq. ft. need a 52-in. to 54-in. fan. For large rooms with multiple seating areas, Alex Reed, marketing director for Big Ass Fans, suggests installing more than one fan or going with a larger model so that everybody can feel the cooling breeze.

To get the maximum cooling effect, a ceiling fan should be 8 ft. to 9 ft. above the floor and directly over the seating area. If the room has a higher ceiling, use an extension rod to lower the fan.

### Increase size to boost efficiency

Having some guidance on how to match a fan to the size of the room makes sense, but if you want a more energy-efficient fan, you should probably go with a larger model than what manufacturers and even Energy Star recommend. This is because larger fans move more air per watt than smaller fans. The amount of air moved in cubic feet per minute (cfm) per watt of electricity used is known as a fan's *efficacy*. This measurement is found on the fan packaging in a 4-in.-wide by



## Cool controls

Some wireless controls allow you to change the fan speed and the light level from your smartphone or tablet. Big Ass Fans' SenseME has sophisticated electronics that turn the fan on and off when you enter or leave the room. It also monitors temperature and humidity and learns your comfort and lighting preferences based on your past adjustments.



## Safe and sturdy mounting

Subject to the constant stress of a spinning motor, and with a 40-lb. fan attached, the electrical box that holds up your fan has an important job. Required by the National Electric Code (NEC), heavy-duty “fan-rated” boxes are usually connected to the home’s framing with robust mounting screws that come with the box. They also include screws for mounting the fan’s hanging hardware that are larger than what’s included with standard electrical boxes. There are many styles of fan-rated boxes available, in both plastic and metal versions, for new construction and remodels. Choosing plastic or metal is often based on personal preference, as both types work fine.



**For new work and more.** Available in many styles, fan boxes for new work are attached directly to the framing. They’re used primarily for new construction and whenever the framing is open, but they also can be used for retrofit installations in ceilings with attic access.

**For old work.** Retrofit boxes like this model install through the hole that’s cut for the box itself. The telescopic mounting bar expands when turned with a wrench until the teeth on the ends sufficiently grab the joist. The electrical box is then attached to the bar with a pair of bolts.



on medium speed. A downloadable chart at the Energy Star website ([energystar.gov](http://energystar.gov)) shows that the most efficient fan sold today is a 60-in. Haiku model from Big Ass Fans that delivers 1124 cfm per watt on low speed and 711 cfm per watt on high.

### Prices vary

Ultra-energy-efficient fans such as the Haiku (starting at \$900) cost more than less efficient fans. To achieve their unsurpassed efficiency, Haiku fans have DC motors, which are more expensive than AC motors but use about 70% less energy. Also, speed control with DC motors is more precise: Six or seven speeds are common, compared to three for AC motors. The Haiku isn’t the only fan with a DC motor; Casablanca, Emerson, Fanimation, Hunter, Kichler, and Minka all use DC.

Blades are another reason for significant price differences between fans. Models that sell for less than \$100 have blades made from flat pieces of plastic or pressed fiberboard. The blades are mounted on the motor at an angle so that they move air. Flat blades are less efficient and move less air than the airfoil-shape blades found on the Haiku, but they cost less to manufacture. Ceiling fans with LED lighting also cost more than fans using conventional compact-flourescent and Edison-style light kits, which are commonly found on less expensive fans.

### From pull chain to remote control

Making fans easy to turn on and off should be a priority. At a minimum, fans should be turned on and off with a wall switch rather than a pull chain.

Some wall-mounted fan switches allow you to change fan speed and lighting level in addition to turning the fan on and off. Depending on the model and your home’s wiring, these controls often don’t need a fan-mounted receiver for operation. As a result, installing one of these controls can be as easy as swapping a light switch. You also can find fans that include a handheld remote control. Remote controls are especially helpful in bedrooms, where you can turn off the lights or adjust the speed without getting out of bed.

In addition to traditional remote controls, there are smartphone apps that allow you to adjust fan speed and lighting level from almost anywhere. Fanimation’s FanSync is one example. This system works with most models from most manufacturers.

Big Ass Fans’ smartphone system, called SenseME, is available on the company’s Haiku models and allows you to control the fans’ seven speeds, to adjust lighting, and even to set a gradual wakeup alarm with increasing light levels and fan speed. The Haiku also features an occupancy sensor that starts the fan and/or turns on the lights when you enter the room and then shuts everything off when you leave.

When you’re considering a new fan, Jeff Dross of Kichler Lighting recommends that you consider how you want to control the fan early in the selection process, as it’s often less expensive to buy one with remote- or app-based controls than to add the capability later. “It’s much like buying a car,” he says. “Options are less expensive when you have them installed on the car when you order it. If you try to install them after you’ve bought the car, they’re very expensive.” □

Patrick McCombe is associate editor. Photos courtesy of the manufacturers.

3-in.-tall energy-information label, making it easy to compare models. The amount of air movement per watt is given at the highest speed. Energy Star fans give the efficacy at three speeds.

Knowing the performance at all three speeds is helpful because it sometimes makes sense to choose a larger fan and then run it on low or medium speed. When building scientist Allison Bailes went looking for a ceiling fan recently, he could have chosen the recommended 44-in. fan that delivers about 60 cfm per watt at high speed, but instead he chose a 52-in. model that produces 117 cfm per watt