



# Choosing a Cooling System

If your home is hot there are many things that you can do to cool your house down without resorting to an artificial cooling system. Some alternatives include: adequate insulation, appropriate shading and landscaping and stopping draughts. These changes can be made to existing homes or included in the planning of a new house or extension. Not only will they make your home cooler in Summer (and warmer in Winter), they will also save you money on your energy bills. For more information on how to do this, talk to us and/or see our Fact Sheet “Tips for Staying Cool”.



If, however, you have implemented as many improvements as possible and your home is still not cool enough, then you may want to install a mechanical means of making you comfortable. There are a few alternatives:

## **Fans, Evaporative or Refrigerative?**

There is a close connection between cooling comfort levels and cost ranging from the cheap but effective fans up to the very effective but expensive refrigerative systems (often called “air conditioners”).

### **Fans**

Large ceiling exhaust fans can substitute for good cross-ventilation by drawing large wafts of cool night air into

the house where the house design or outside breeze does not do that for you naturally. Also, ceiling, pedestal and table-top fans can cool you by generating a breeze across your skin when the air would otherwise be stuffily still. Extensive research has shown perceived benefits of

around 3°C for such breezes and even more in minimal clothing. In most Canberra houses, that’s enough to feel comfortable almost all the time and each fan uses less than 100 W and is very cheap to run.

**A well designed home in Canberra has no need for air conditioning.**

### **Evaporative**

In part, the cooling effect of fans is from the evaporation of perspiration from your skin. This same effect can be had for your whole house by blowing air through a wet filter fabric as is done in an Evaporative Cooler. These devices push large volumes of naturally cooled air into your house and work best when windows or doors are open at the far corners to allow the constant replacement of hot dry air with cool moistened air. Their effectiveness declines in humid conditions but Canberra only has less than 50 hours per year with simultaneous high temperature and humidity. Such systems are relatively cheap to run with even the larger ducted ones drawing typically less than 1000 W with the fan on “High”.

### **Refrigerative**

Refrigerative cooling is often referred to as “air conditioning”. It works on the same principle as your refrigerator and moves heat from a cool place to a warm place. It provides the highest standard of comfort in almost any weather by cooling and dehumidifying the air but it is also expensive to run in terms of energy consumption and can be a noise nuisance to you and/or your neighbours. A 2-star cooler keeping an average existing 150 m<sup>2</sup> house comfortable for all waking hours will consume around 1,100[1] kWh or just on \$100 per average year.

## Reverse cycle

When a refrigerative cooler is set up to move heat from the cool outside into the warm inside it is called a “heat pump”. Typically they will supply more heat than double the amount of electricity they consume so they are highly efficient devices although they consume the most expensive form of energy – electricity. A heat pump that is designed to switch between heat pump mode and cooler mode is usually called a “reverse cycle air conditioner”.

## Other Issues to Consider:

### Airconditioning System Types: Window/Wall Cooler, Split Systems and Ducted Systems

Window/wall coolers are the cheapest option and, although they are well targeted to a particular hot space, they are often too noisy to be thoroughly enjoyed.

Split systems have separate internal cooling units connected by pairs of insulated pipes (carrying the refrigerant, as a gas one way and a liquid the other) to an external heat dissipation unit housing most of the workings to keep the noise outside. Ducted systems have a central air cooling unit (usually in the roof) with ducts to each room requiring cooling. They can be relatively inefficient both by cooling rooms that do not need it and by having the coolest air in close contact with the hottest air (inside your roof) with scant insulation in their duct walls. R 1.0 is now the legal minimum but R 0.6 was common before then (while your ceiling is probably R 4.0).

## Star rating

Air conditioners (whether heat pump, reverse cycle or cooler only) are energy star rated with the more stars the higher the efficiency. For the same load, a 6 star cooler will use 28% less electricity than a 2 star equivalent so careful selection can save you many dollars every year.

## Peak demand and power pricing

Air conditioners generally consume the most electricity at the time when it is most in demand overall. At times of peak electricity use the most expensive generators have to be brought into operation to meet the extra demand.

This factor is not yet explicitly included in the price set for domestic electricity, so the trend to more air conditioning, especially in Adelaide, Melbourne and Sydney, could

result in price changes that will substantially increase the running cost of home air conditioning in the near future (as has recently happened in South Australia). While not certain, any decision to install a cooler needs to bear that possibility in mind.

## Expected costs

Annual running costs depend on the house and the system chosen.

Cooler Type	Average Electricity Use	Average Annual Cost
Fan	20 kWh	\$2
Evaporative Cooler	220 kWh	\$20
Refrigerative Cooler (6*)	750 kWh	\$65
Refrigerative Cooler (2*)	1,100 kWh	\$100

## More information

This fact sheet is produced by the Home Energy Advice Team (HEAT) to provide you with some quick tips on keeping your house cool in summer. If after reading it you'd like more free information about this or any other topic to do with saving energy in your home, don't hesitate to contact us:

