

Energy Efficiency

By Evan Logan

With increasing energy prices and a growing global concern about climate change it is more important than ever to have a well designed, energy efficient home.

The energy efficiency of homes has become increasingly sought after by home buyers and builders, so what exactly makes up an energy efficient home?

Why are Energy Efficient Homes Important?

An energy efficient home has the advantage of reducing energy bills, minimising your impact on the environment and creating a comfortable living environment. There are many simple, low-cost solutions to reduce energy use at home, most of which simply require a change in behaviour. Other options require money but will pay for themselves through savings made on lower electricity bills.

An energy efficient home is made up of a number of different factors including:

- The design of the house
- The appliances and facilities
- Behaviour of occupant

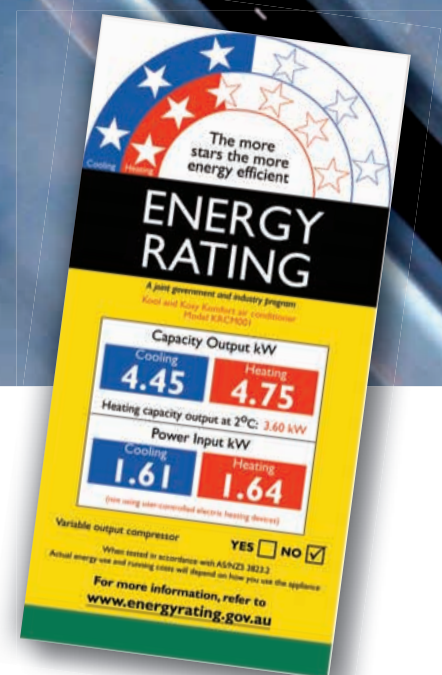
Assessing your home

Any home can be designed for energy efficiency whether it is an existing home or new project. An experienced energy efficiency consultant can assess your home and energy usage patterns, as well as identify the best opportunities to save money and reduce your impact on the environment. Energy efficiency consultants have access to sophisticated computer modelling programmes which can improve the quality of design and lower energy demand on a home. A good energy consultant will identify low or no cost practical advice and ideas on how to achieve the best possible outcome for your existing or new home.

Practical Advice and Tips

Energy Efficient Design – Lower Heating and Cooling Requirements

I am sure at some time or other we have all felt how uncomfortable a home can be, with expansive unshaded west facing glazing letting in too much sunlight in summer, or a damp, cold room with minimal windows reducing natural



light and ventilation. With careful design and consideration of orientation, insulation levels, sizing and shading of glazing and making use of cooling breezes, the comfort, warmth and brightness of a home will be optimised.

Orientation of the building is an important part of an energy efficient home. With good orientation and adequate eaves, a home can be designed to maximise beneficial winter sun and exclude unwanted summer sun and excessive heat gains. An ideal block will be positioned with a northerly orientation. This will allow for the best use of solar passive design. By orientating most glazing in the living rooms to the north, winter sunlight can be harnessed to heat and cool the house naturally.

Insulating ceilings, walls and raised floors is one of the most effective ways of maintaining comfortable internal temperatures and reducing energy bills. An experienced energy consultant can determine the most appropriate insulation types and optimal insulation levels for your house.

Glazing is generally the path of least resistance for heat loss and gain in a fully insulated dwelling. It may be difficult

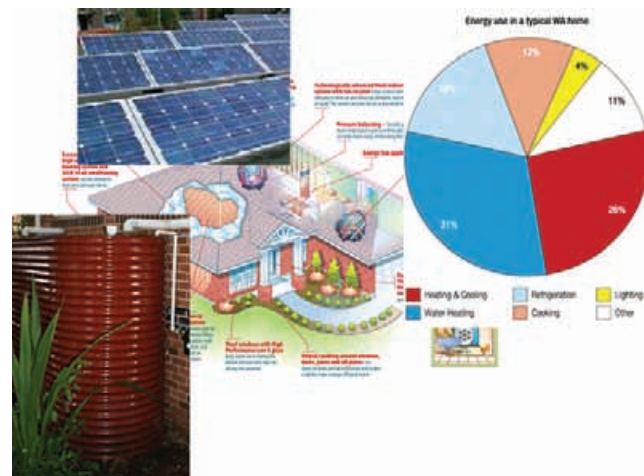
An energy efficient home has the advantage of reducing energy bills, minimising your impact on the environment and creating a comfortable living environment.

to achieve a comfortable house with large areas of poorly orientated glazing. An energy assessment on your home can be used to identify problem areas of glazing and determine the most cost effective improvements.

External shading devices such as well placed vegetation or blinds and shutters are the most effective way to reduce heat gains through windows. Dense trees to the South-East and South-West can provide shading from early morning and late afternoon sun. Look at the possibility of deciduous vegetation to reduce summer heat gains while allowing sunlight through the windows in the winter.

To keep warmth in during winter, check windows are well sealed; consult with an energy consultant to see if double glazing or replacement of large, problem windows is an option. Use tightly fitted internal blinds with fitted pelmets to reduce heat loss at night.

Air leakages can account for up to fifteen to twenty-five percent of heat losses and gains to a house. You may be losing heat or cold via unsealed extract fans or an open fireplace - a low cost damper over your existing extract fan or chimney will resolve this problem. Draughts around windows and doors can be reduced using weather strip around the edges and bottom.



Ventilation helps cool a home in summer. The effective positioning of doors and windows will allow good cross ventilation and access to sea breezes. Open windows late on a summer's day to let in cooling late afternoon and night-time breezes. Where ventilation is minimal, ceiling fans can be an effective cooling alternative on most summer days. Look at using water bodies such as ponds or pools and vegetation in courtyards to cool breezes before entering the house.

Appliances – Reduce Energy Demand

Careful choice of appliances can dramatically reduce energy use, cost of bills and reduce impact on the environment without compromising your lifestyle.

Check the Energy Rating label when choosing appliances. The Energy Rating label enables consumers to compare the energy efficiency of domestic appliances. The star rating of an appliance is determined from the energy consumption and size of the product. Remember appliances cannot be compared by size as a larger model may have the same star rating as a smaller model but will use more energy.

Here are a few tips for different household appliances:

Hot Water System

Look at low cost options such as reducing your hot water use by using water efficient showerheads and taps and reducing shower times.

When replacing or buying a new Hot Water System, research the most appropriate and efficient system for your location and requirements, such as a gas or electric boosted solar water heater or a heat pump. Consult an expert to find the right system for you current needs.

Space Heating and Cooling

When choosing your heater make sure to size it correctly. Consult an expert for ideal sizing.

Consider the following:

- Using ceiling fans or evaporative coolers (where appropriate)
- High Energy Ratings
- Air conditioning installers who work in accordance with AIRAH Best
- Practise Guidelines

And remember when adjusting your thermostat controls: "For every one degree Celsius rise in thermostat setting, around ten percent more energy is used."

Refrigeration

When buying and operating a fridge and freezer consider the following:

- Check the energy label
- Locate it in a cool, ventilated area (75mm air space) for the fridge/freezer to work at an optimal level

- Allow for twenty percent free space within your fridge for air circulation
- Defrost regularly and check the door seal is in a good condition
- When adjusting thermostat controls use the following as a guide
- Fridge : 3C to 5C
- Freezer : -15C to -18C

Lighting

Reduce the need for artificial lighting by making use of natural light (e.g. energy efficient skylights, light coloured finishes and/or furnishes).

Look at the use of high efficiency fluorescent lighting in frequently used areas. You can use approximately twenty-five percent less energy than the running cost of an incandescent lighting, plus compact fluorescent lights last up to eight times longer than most incandescent bulbs.

Behaviour – Use of Efficient Houses and Appliances

One often understated way of making your home more comfortable, thermally efficient and sustainable is using it correctly. Unfortunately most houses don't come with a user manual. A good energy consultant will not only advise on physical improvements but also advise on how the house can be used more efficiently.

Look at your current home situation. Do you do the following:

- Close drapes during hot summer days to reduce heat gain?
- Close drapes on winter evenings to reduce heat loss?
- Open windows late afternoon to take advantage of natural cooling?
- Turn off all lights in the house when not in use?
- Turn off the home computer when not in use, or activate standby shutdown feature?
- Turn off appliances at the wall when not in use, saving standby power?
- Take short showers (four minutes) to reduce use of hot water?
- Turn off the second fridge when not in use?
- Replace incandescent globes with compact fluorescent lamps?

It's not difficult to cut energy costs in your home. By making minor changes in the way you run your house and appliances you can make significant savings. Over time the savings will add up.

Evan Logan is Senior Sustainability Consultant at the Australian Energy Efficient Building Consultants (AEEBC). For more information about energy efficient homes please contact Australian Energy Efficient Building Consultants, Energy@cadds.com.au, or visit www.cadds.com.au.