Your Guide To Heating and Cooling Energy Saving Tips

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Introduction

Australian homes need heating and cooling. On average, about 30% - 45% of the energy we use at home is for this, depending on where you live and what you live in.

You have heard it many times before…….there is countless ways to make your home more comfortable all year round. In 23 years of business, I have seen and heard it all as to why no consideration is given to window blinds, window sizes and draft-proofing

To maximise the efficiency of your insulation, draft-proof your home to reduce the leaking of heated or cooled air. Even if your home is well-insulated, by cutting down on drafts you can save up to 25 per cent of your heating and cooling bills. Weather sealing or draft proofing your home is one of the easiest and cheapest ways of lowering energy costs.

Insulation is a good barrier to reducing heat loss in winter and heat gain in summer, particularly in roofs, ceilings, walls and floors. It helps to keep your home efficient in winter and summer.

Windows let in useful warmth and light in winter, but in warmer weather sometimes this can be too much. Heat gain through an unshaded window in summer can be 40 - 80 times greater than through the same area of insulated wall. In winter windows can allow up to 40 per cent of your heat to leak out. This means you'll be using more energy to keep your home comfortable and paying larger energy bills.

Read on and let us know what you think and whether this guide was helpful or tells us where we can improve on it!

What to Consider

Passive design, means "doing things to help maintain the temperature of your home with minimal heating and cooling assistance".

Make sure you consider the following ideas when you are building or renovating -

- Insulating the floor, walls and ceiling where applicable
- Draught seals around windows and door
- Using the winter sun to warm the house
- Minimising the summer sun from the house
- Using cross-flow ventilation.
- Window location, type, glazing and size / window furnishings
- Colour of the roof / external walls

Talk to your architect or builder who will know many ways to incorporate all or few of the above.

If your home or apartment isn't designed for passive cooling / heating, then consider a solution that's best for you depending on where you live and your lifestyle.

The climate, how you intend to use it and even its location can make a big difference to the level of comfort and running cost.

There are many types of cooling /heating solutions using gas or electricity as the source with varying levels of efficiency. The best type of system for you will depend on your circumstances.

Insulation

Insulation is a good barrier to reducing heat loss in winter and and heat gain in summer, particularly in roofs, ceilings, walls and floors. It helps to keep your home efficient in winter and summer.

Over half of the cooling / heating energy in your home simply escapes without insulation. Insulation helps to reduce the use of cooling / heating systems therefore saving you money on bills and improves the comfort of your home.

Check with your supplier or contractor as there are minimum standards for insulation, the higher the "R value" the better! The design of your home and orientation (north facing), construction materials are other main factors.

Insulation's ability to prevent heat coming in or out is described as its 'R-value'. The higher the R-value, the better it protects. Insulation products must be installed correctly to be effective. The insulation needed will depend on your home.

There are two main types of insulation -

- Bulk insulation (batts, rolls or boards) acting as a barrier to keeping heat in or out of your home. Made from materials like glass wool, polyester, wool or recycled paper.

- Reflective insulation, keeping your home cool by deflecting radiant heat. It's usually aluminium foil on one side and comes in batts or sheets.

Some products combine features of both bulk and reflective insulation. The type of insulation best for you will depend on where you live and whether you need to keep heat in or out or both.

When building or renovating your home, it's a good time to insulate. It works out cheaper and can be more effective and done properly. Walls are easier to insulate at this stage!!
Areas to insulate -

Ceilings and roofs

- Information on the internet suggests that 40% - 45% of the cooling and heating energy is lost via the roof (including verandahs).

Walls

- Uninsulated walls account for 15% heat loss in winter; western walls increase heat gain by the same amount in summer.

Floors

- Heat can be lost through some types of floors – timber floors by 5%. Carpets or rugs are one option, as well as batt type insulation if the house is raise above the ground. Be careful, some floor insulation may interfere with the natural cooling from the ground beneath the house.

Draft-proof your home

Draft-proofing is one of the cheapest and most efficient ways to save energy on cooling / heating costs in any type of building. Drafts are a bit like ventilation, both let fresh air into your home.

Good ventilation helps reduce condensation and damp. But drafts are uncontrolled; they let in too much cold air and waste too much heat. To draft-proof your home you should block up unwanted gaps that let cold air in and warm air out, meaning you'll use less energy to cool and heat your home.

Even if your home is well-insulated, by cutting down on drafts you can save up to 25 per cent of your heating and cooling bills. Weather sealing or draft proofing your home is one of the easiest and cheapest ways of lowering energy costs.

Drafts happen where there are unwanted gaps in the construction of your home, and where openings are left uncovered. You'll find drafts at any accidental gap in your home that leads outside, such as –

- Windows
- Doors – both external and internal
- Floorboards and skirting boards
- High wall vents on older homes (Victorian, Federation and Californian bungalows)
- Un-used chimneys and fireplaces
- Old extractor fans
- Cracks in walls (seek professional help)

Be careful in areas that need good ventilation like –

- Areas where there are open fires or open flues
- Air needs to flow in and out of your house so it stays fresh, dry and healthy. Make sure you don't block or seal any intentional ventilation
- Extractor fans – these take out damp air quickly in rooms where lots of moisture is produced (kitchens, bathrooms and utility rooms)
- Under-floor grilles or airbricks – these help keep wooden beams and floors dry
- Some wall vents – to let small amounts of fresh air into rooms
- Trickle vents – modern windows often have small vents above them to let fresh air trickle in.

- **Seal gaps and cracks**
  Look for gaps and cracks and block or fill them. They are often found around doors and windows. Check floorboards, architraves, skirting boards, sky-lights and cornices - anywhere there are joins.

- **Install draft stoppers**
  Put draft stoppers at the base of doors to help keep warm air in during winter and cool air from escaping in summer.

- **Check fans, vents and other outlets**
  Install automatic closing mechanisms over exhaust fans and vents. Talk to an electrician or supplier for advice. You may be able to add covers to existing fans.

Improve window performance

Windows let in light……..and **HEAT**. Warmth and light in winter, light and excessive heat in summer….. if you're not careful! Windows can cost you a lot of money to keep your home cool or warm meaning using more energy to keep your home comfortable (huge energy bills).

The sun is the main source of heat gain in your home. Sun streaming through your windows has the same heating effect as an electric bar heater for every square metre of window! This is great in winter, but a massive problem in summer. Shading windows from the outside is the most effective way of preventing unwanted heat, an uncomfortable home and high energy costs in summer. Being smart with your shading can let the winter warmth in and keep the summer heat out.

Window film, double glazing, Energy rating

- Window film is another cost effective option for reducing heat gain. Some window films claim to halve the amount of solar energy coming through the window. Verify this claim with the manufacturer / contractor. This option may reduce the light!

- Double glazing on windows and skylights helps keep heat in or out reducing outside noise. Double glazing is useful for air-conditioned homes to keep cool air in. The effectiveness of double glazing depends on the installation, type of window frames and where you live.

- Choose windows and skylights that can open wide for natural ventilation and make sure they are airtight when closed.

- Look for the "Window Energy Rating Scheme" label when selecting / installing windows……just like air conditionings and white goods!! The star rating shows how well the windows keep heat and out (5-star rating is the max and the best performance).

Window coverings / furnishing

Window furniture is a good way to deal with problems with existing windows especially west facing. Heavier fabrics, block-out blinds and multiple layers give the best protection.

Trapping a layer of still air between a window and curtain / blind prevents the heat escaping and entering. Snug fitting curtains and blinds can create this effect…..even "old-fashioned" fitted pelmets. Really anything to create such a barrier….even taping the top, sides and bottom to the architrave will do!

Use of external blinds and awnings (light in colour and reflective) in summer dramatically reduces the incoming heat and provides shade.

An unprotected window can increase room temperatures by 3°C - 7°C (this is what we have experienced). External shading is more than twice as effective as internal blinds at keeping the summer heat out.

Shading windows to the east or west

Windows located on the east and west walls of your home are the biggest problem as the morning and evening sun is low and cannot be blocked out by the eaves of the house. Shading for east or west

windows, needs to be low over the window and removable in the winter (to let the heat in).

Use of external blinds and awnings (light in colour and reflective) in summer dramatically reduces the incoming heat and provides shade. They cut out about 30% - 50% of the heat and can easily be lifted up to enjoy natural light when the sun is off the window.

Other things you can do include growing a small tree or a large shrub outside of the window. Deciduous varieties will drop their leaves to let in the winter sun. Planting can cut 30 - 50% of the summer heat from a window.

Shading windows to the north

Most houses have eaves to shade windows to the north from the high summer sun. The lower winter sun can come in under the eaves to warm the house. Some solar-passive homes often have pergolas to shade the windows and alfresco areas to the north without cutting out winter warmth. Add fixed awnings where there are no eaves or shade sails to protect paved areas from the summer sun. A paved or concreted area heats up and continues to radiate heat in at night

Need cooling or heating?

Choose an efficient cooling / heating option. We have provided this in other documents for you to download and read.

Cooling

If you're looking to buy "something", consider what type will suit your requirements best. There are a few types of cooling aids: fan, evaporative coolers and air conditioners.

Fans are the cheapest to run and use the least amount of energy. If a fan is enough to cool your home, you can save a lot of money and energy.

Evaporative coolers work well in areas with low humidity, so let's not bother with this option in Sydney.

Air conditioners use the most amount of energy and create more greenhouse gas emissions than fans or evaporative coolers. They work most efficiently in well-insulated homes with well-ventilated roof cavities.

Think about the following before purchasing –

- Does the room need cooling or is it enough to improve shading and ventilation?
- How big an area do I need to cool (single or multiple areas or the whole house)?
- How often and for how long will I need cooling for?
- How much will the system cost to run?
- Does the system come with a timer?
- Do I want to cool a room or a system for more than one area?
- What options do you have for powering the cooler?

Heating

If you're looking to buy "something", consider what type will suit your requirements best. There are a few types of heating aids: many varieties electric heaters, gas-flued heater, gas central ducting, reverse cycle split and ducted systems.

Speak to friends and find out what works for them and if they are happy with the running costs!!

Think about the following before purchasing –

- How big of an area do I need to heat (single or multiple areas or the whole house)?
- How often and for how long will I need heating for?
- How much will the system cost to run?
- Does the system come with a timer?
- Do I want to warm a room or a system for more than one area?
- What options do you have for powering the cooler (mainly gas or electric)?

Heating Options

Flued gas heaters and reverse-cycle single / multi splits are cheaper to run than electric heaters, producing less greenhouse gases. Unflued gas heaters cause indoor air pollution in your home!

- Ducted central gas heating systems use gas as the energy source.
- Reverse-cycle air conditioners (for cooling and heating) are the most energy efficient type of electric heater.

- Transfer fans to direct air to untreated parts of your home. They can be cost-effective to install and low-cost to run.
- Electric portable heaters are cheap to buy but expensive to run.
- In-slab floor heating (electric), may be the most expensive to run.

Dress appropriately for the weather. Putting on a sweater is better than turning the heater up.

Heating Tips

- Some units are noisy in operation. Split systems (where the compressor is outside) are quieter inside but consider your neighbours when using
- Reverse cycle models can be used for heating. Units that use electric heating elements (in places like the Blue Mountains or Canberra) cost more to run and produce more greenhouse gases
- Adjust louvers to point hot air down towards the floor
- On ducted systems, install zones so only rooms requiring heating are warmed.
- Make sure the systems have features such as thermostat and timer control.
- Never set the thermostat at a temperature higher than required. Aim to set the thermostat as low as possible.
- Do not leave the heating system on overnight or when you are out. If you must, ensure you have a timer and turn your system on about 15 - 30 minutes prior to your return.
- Locate thermostats in the most used rooms and away from sources of cold.
- Maintain your heating system. Clean filters regularly.
- Close windows and doors in areas where a heater or air conditioner is on unless ventilation is required for un-flued gas appliances.
- Close drapes and blinds, “NO IFS OR BUTS”.

Each degree of extra heating in winter will increase energy consumption by about 5 to 10 per cent. Set the thermostat to 18° to 20°C in winter.

Cooling Options

If your home isn't designed for cross-flow ventilation or passive cooling, the option is to choose a cooling system for your application.

Options may include:

- Fans, cheapest option and often sufficient
- Evaporative coolers, good in low-humidity areas (not Sydney)
- Inverter air conditioners (single, multi system or whole house type)

If an air conditioner is inappropriately sized, not installed correctly and maintained properly; it will cost you more in electricity. Always clean the filters on the system at the beginning of each season to ensure reliability and efficiency.

Cooling Tips

- Shade outdoor components from direct sun.
- Some units are noisy in operation. Split systems (where the compressor is outside) are quieter inside but consider your neighbours.
- Adjust louvers to point cold air towards the ceiling as cool air falls.
- For ducted systems, install zones so only rooms requiring air conditioning are cooled.
- Make sure the systems have features such as thermostat and timer control.
- Never set the thermostat at a temperature lower than required. Aim to set the thermostat as high as possible. Setting it lower does not make the unit cool faster.
- Do not leave the cooling system on overnight or when you are out. If you must have the house comfortable when you arrive home, ensure you have a timer and turn your system on about 15 - 30 minutes prior to your return.

- Locate thermostats in the most used room and away from sources of heat.
- Maintain your cooling system. Clean air filters regularly.
- Close windows and doors in areas where the air conditioner is on.
- Close drapes and blinds, and utilise the external shutters if installed

Each degree of extra cooling in summer will increase energy consumption by about 5 to 10 per cent. Set the thermostat to 24° to 27°C in summer.

Summary

You can do all or some of the above things and tricks to reduce the amount of energy to keep you comfy all year round.

If you are planning on building a new home, make your home energy smart from the start. You'll be surprised how much of the upfront costs you'll recover in energy savings cost. An energy-efficient home may also increase the value of your home come re-sale time.

Good design reduces your energy use without compromising comfort.

Cooling / Heating cost savings

- Insulate your ceiling, roof, walls and floors if possible
- Seal drafts as mentioned above
- Use the timer switch and set the thermostat to a sensible temperature.

- Keep the system maintained and the filters clean to improve airflow and efficiency.
- Close doors to rooms that you are not using (including the laundry and bathroom).
- If you have windows or vents that are permanently open, keep the doors to these rooms closed.
- Open curtains during the day to let in the winter sun. Close curtains at night to stop heat escaping
- Use rugs or carpets on timber or slab floors.
- Consider double-glazing to insulate windows.
- Cover the tops of curtains with pelmet boxes to reduce heat loss through glass windows.
- ***Dress appropriately to stay warm.***
- Shade windows from the summer sun. Deciduous trees can be an attractive way to shade windows, walls and your roof.
- Close curtains to keep heat out when the sun is on the windows.
- Keep windows shut in the hottest parts of the day.
- Open up your home to breezes when it's cool outside.
- Make the most of natural airflow by opening low-positioned windows to bring the breeze in and high windows to let the hot air out.
- Consider using roof ventilators, vented ridges, ventilated eaves and ventilated ceilings to allow heat to escape from your roof space.