

Working Together

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Sustainable house design for new homes

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The South Australian Murray-Darling Basin Natural Resources Management (SA MDB NRM) Board is working towards creating a clean and healthy atmosphere with effective adaptation to climate change. From 2010 new houses must comply with an energy efficiency rating. For more comprehensive information on designing an energy efficient house visit the Department for Transport, Energy and Infrastructure website: www.energy.sa.gov.au.

GETTING STARTED

Deciding to make your home more energy efficient need not be expensive. Start with low cost measures and take gradual steps to creating a sustainable home.

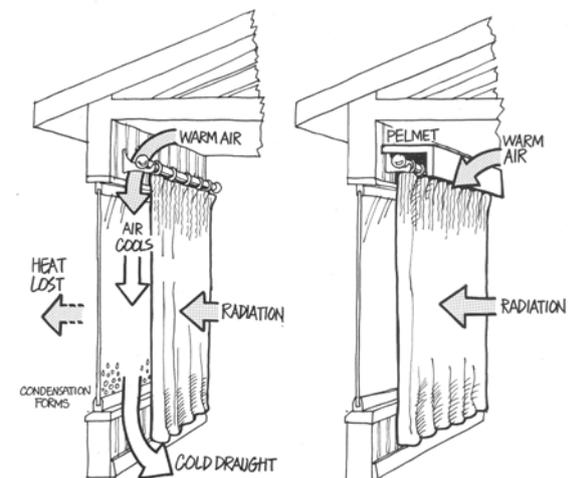
Climate: The number of days over 35°C or under 5°C at your house will determine whether heating or cooling will be a main concern when developing your design.

Your site: Every location demands different design parameters to maximise environmental potential – slope, shading and orientation must be considered. Good design positions living rooms on the northern side of the house and sleeping rooms on the south.

Orientation: Good house design runs east-west and has access to winter sun from the north. In the SA Murray-Darling Basin (MDB) Region, solar north is around 10 degrees west of magnetic north.

Insulation: Walls and ceilings require insulation. Some building materials provide insulation, but in most cases will need to be supplemented by foil or insulation batts. In hotter parts of the SA MDB Region light-weight materials will cool at night over summer and in colder parts of the SA MDB Region denser materials will retain heat over winter.

Windows: Small windows to the south, no windows to the west and northern windows that extend to floor level are ideal. This allows winter sun to enter the house to warm rooms, but prevents heat gain in summer from afternoon sun, while small southern windows reduce heat loss in winter. The type of glass should also be considered along with the positioning of windows to utilise wind direction for cooling breezes throughout the home.

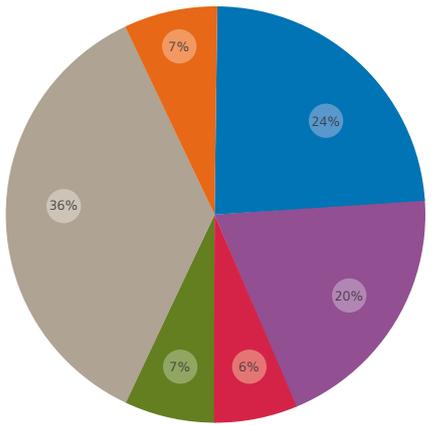


The benefit of adding a pelmet.



MORE INFORMATION

For more information contact the South Australian Murray-Darling Basin Natural Resources Management Board
Phone: (08) 8532 1432



- Fridges & Freezers
- Heating & Cooling
- Lighting
- Cooking
- Water Heating
- Other Appliances (incl. standby)

Domestic products, power use.

Overhangs: Eaves that allow winter sun into the house but prevent summer sun from striking the glass are an important design aspect. As a general rule the eave needs to extend around half the height of the window, but this should be calculated for each location.

Thermal mass: Heavy materials such as stone, compressed earth or concrete can be positioned to collect heat during the day and release heat after sunset. If the sun falls on the floor during the day it will gather heat to release overnight, thus lessening the need for heating during winter.

Water: Each millimetre of rain falling on a square metre of roof gathers one litre of water. Even in a 300mm rainfall area, a 250 square metre house roof supplemented by a 6m x 6m double garage can collect 85,000 litres of water over a year. This will provide over 80% of two people's annual requirements. Two 22,500 litre tanks are recommended for sufficient water storage.



Heating and cooling: Tolerating temperatures between 20°C and 30°C will reduce energy bills, and when required cooling can generally be provided by ceiling, bench or floor fans. A good heater is one that uses a minimum of electrical, fuel or transport resources. Generally gas (especially reticulated natural gas) and reverse cycle (heat pump) inverter heaters are most efficient.

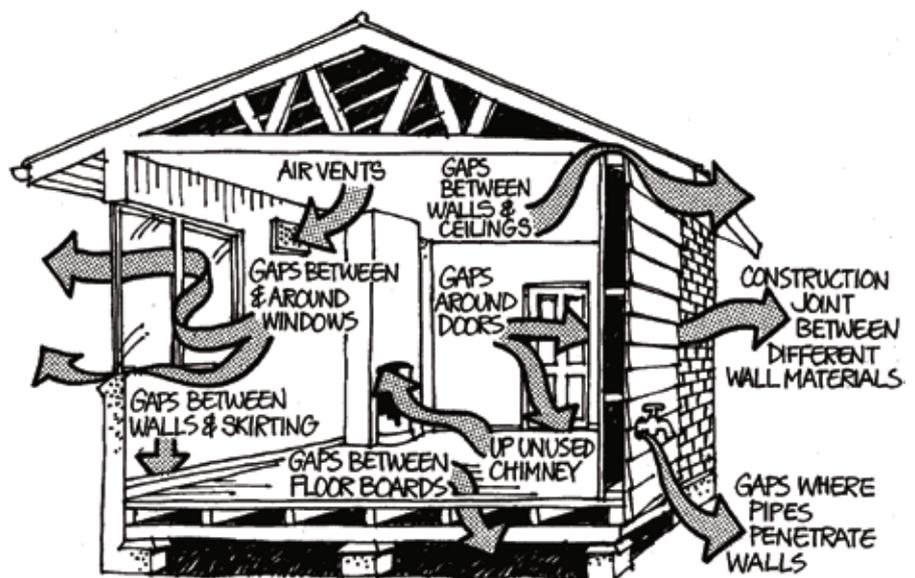
Lighting: Incandescent fittings are no longer available, having been largely replaced by compact fluorescent (CF) globes. Strip fluorescent fittings for ultra thin T5 tubes generate the same amount of light but use around 70% of the power. Newer still are LED fittings that draw around six watts and provide the same light as a 50 watt halogen globe.

Photovoltaic panels: State Government financial incentives assist in the installation of grid return photovoltaic panels. The panels are placed on a north facing roof and connect to the mains via an inverter. They provide power to the house during the day and send excess power to the grid. If the power generated is greater than the power used the home owner receives a bonus from the power retailer.

Hot water: A solar hot water service (HWS) uses the sun to heat water during the day and electricity or gas to boost water temperature during cloudy periods. A solar HWS can reduce the power needed to heat water by around 75% if used properly. Heat pump HWS units are also available that use the heating principle of a reverse cycle air conditioner. Both units need special modifications to be able to be used in low temperature climates.

Appliances: All appliances for sale in Australia are marked with an energy star rating and the expected annual power use. The lower the power use the higher the number of stars. Refrigerators use the most power and careful consideration should be given before purchasing. Turning appliances off when not in use can reduce the energy consumption in your new home.

Note: Building work needs to comply with state and federal regulations and use of licensed tradesmen is often a requirement. Tradesmen can also provide information on new products to achieve a higher efficiency.



Gaps in housing leading to higher energy costs.

Use of the information and data contained is at your sole risk. Graph, house air flow and eaves overhang images courtesy of Department of Transport, Energy & Infrastructure.