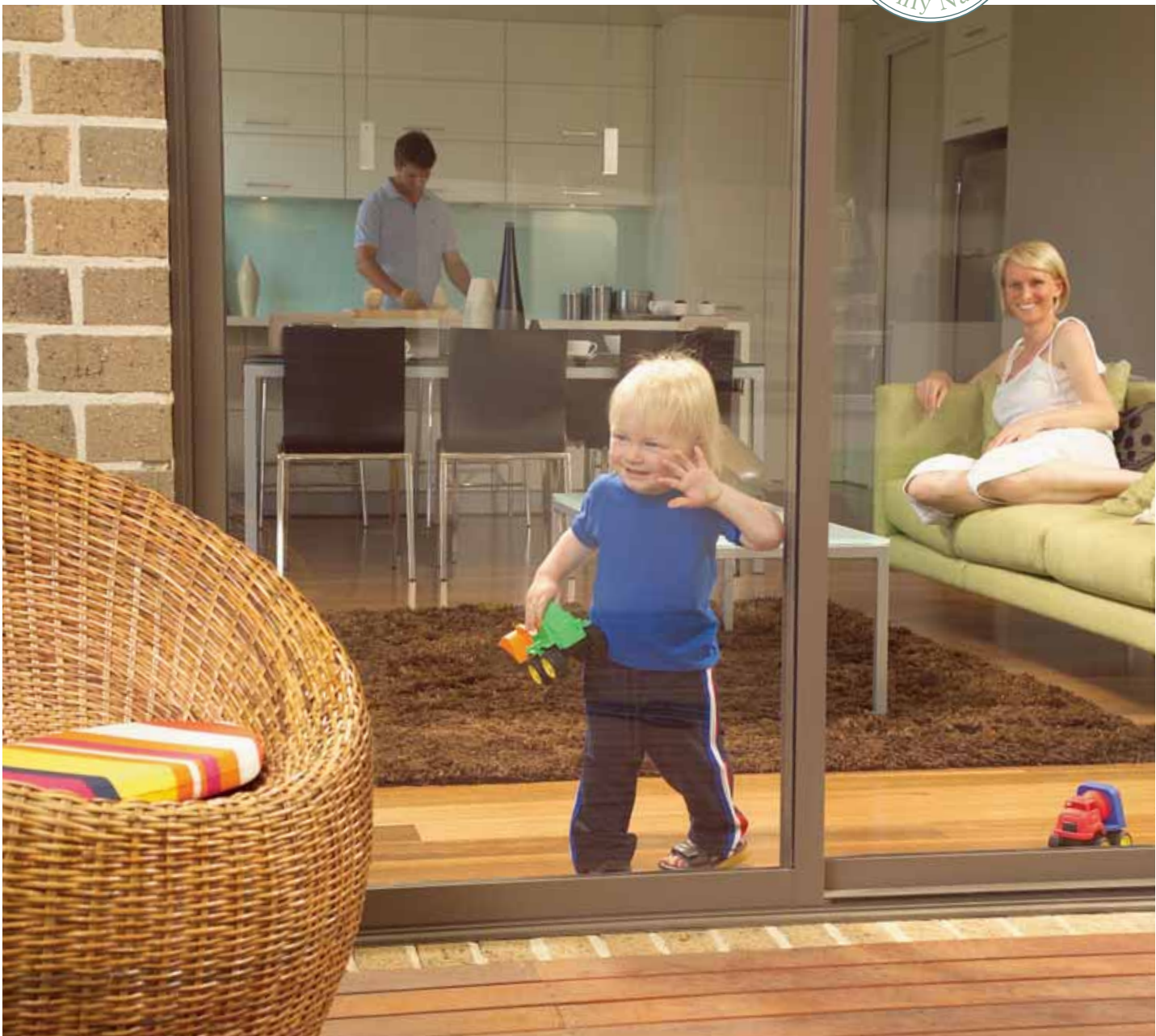




ENERGY-EFFICIENT HOMES



FACTS FOR CONSUMERS



Bricks Are a Natural Part

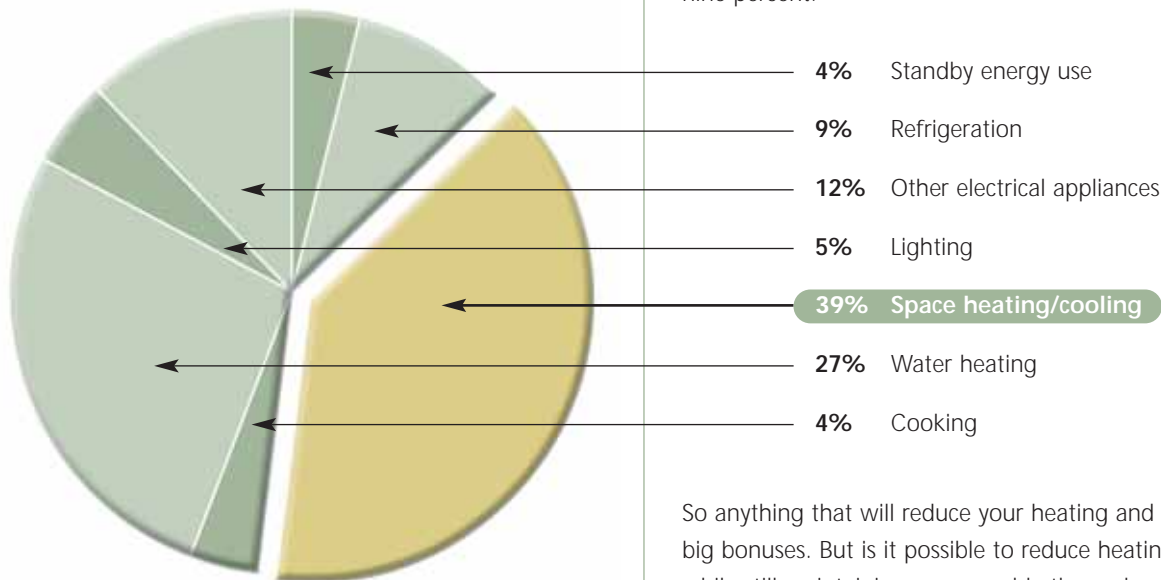
Bricks have long been accepted as Australia's preferred building material. Almost 90 percent of new houses are built in brick.

In recent years attention has focused on reducing energy use in all its forms. Building regulations now require new houses to be more energy efficient.

Building materials and design play a key role in energy efficiency. But where does brick fit into this and what do you need to know to make an informed decision?

How Much Energy Do We Use?

You may be surprised to learn that a massive 39 percent of the energy consumed in an average Australian household goes into heating and cooling. By comparison lighting and cooking together consume just nine percent.



Energy use in the average Australian home

(from Australian Greenhouse Office
www.greenhouse.gov.au/yourhome/technical/pdf/fs40.pdf)

So anything that will reduce your heating and cooling bills will pay big bonuses. But is it possible to reduce heating and cooling energy while still maintaining a reasonable thermal comfort level inside the home?

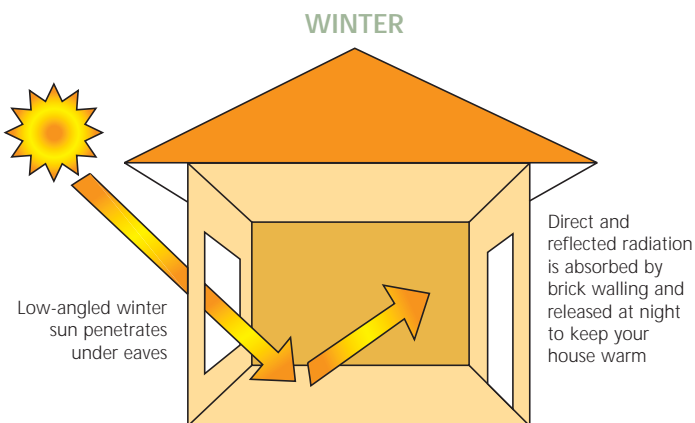
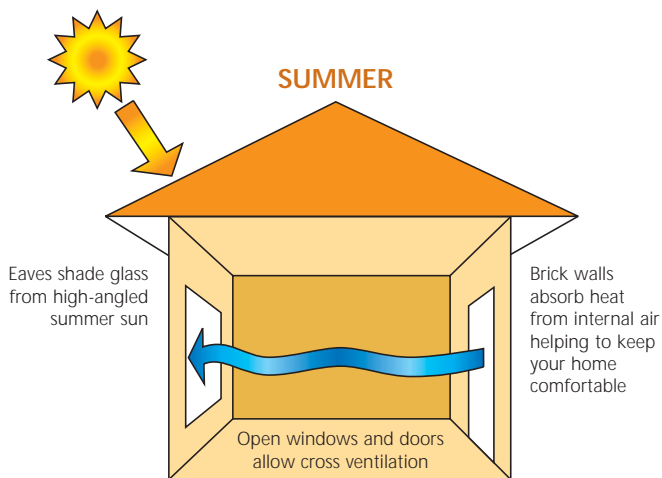
This Is Where Passive Design Comes In

Passive design manages the sun's energy to naturally boost your house's heating and cooling. There are four key passive design principles:

- **Orientation** Large glass areas on the north side (which gets the most favourable sun) lets in the low winter sun. Simple shading such as eaves will block out the higher summer sun.

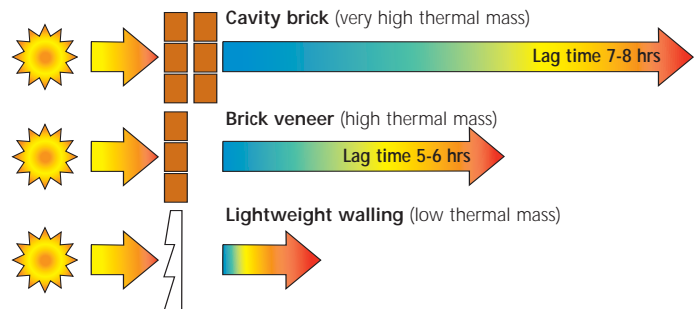
of Energy-Efficient House Design

- **Ventilation** Once the peak of the summers day has passed, air is allowed to enter and leave the building, cooling it – and its occupants – naturally. Cross ventilation is maximised by generous openings on either side of the house with minimal internal obstructions.



- **Insulation** Wall and ceiling insulation acts as a barrier to the movement of heat. The effectiveness of insulation is measured by its R-value. However, the R-value does not tell the full story. Different walls may have similar R-values but not perform identically, as the R-value does not reflect the beneficial effects of thermal mass.

- **Thermal mass** Heavy, dense wall materials, such as brick, absorb heat and slow down its transfer through the wall. This moderates temperature changes, slowing down heat gain in summer, and storing heat in winter. This is called its 'lag time'. Lightweight walls made from fibro, weatherboard and corrugated iron have very low thermal mass when compared with brick walls.

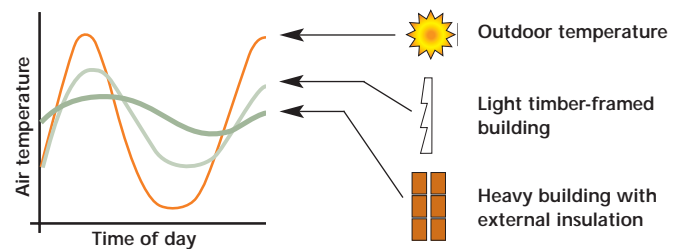


Because of their thermal mass, brick walls are more able to moderate temperatures than lightweight walls, even though their R-values may be similar.

Think Thermal Mass. Think Brick.

The first two principles of energy efficient passive design – orientation and ventilation – must be designed into the building. Insulated walls have similar R-values regardless of the material. However, the choice of wall material has a major influence on the amount of thermal mass in a building.

A simple and economical way to build in thermal mass is with bricks. Clay bricks have a very high thermal mass and will help make your home comfortable and energy efficient.



Source: *Your Home, Technical Manual*, sec 1.7, Australian Greenhouse Office

Research at The University of Newcastle has shown that "a large portion of the heat is reflected back to the external environment by the exterior surface of the brick." It also concluded that in summer the inside temperature in brick buildings stayed within the "human comfort zone" despite severe fluctuations in the external temperature.*

* Download the full research report at www.cbpi.com.au/resources/research/cbpi_research_paper_18.pdf.

What can we conclude?

- ✓ Passive design will lower your heating and cooling bills. That's good for you and good for the environment.
- ✓ Thermal mass is essential to any passive design.
- ✓ Brick is a simple and economical method of building thermal mass into your next home.



your Home

What Do the Authorities Say?

Thermal mass acts as a 'thermal battery'. During summer it absorbs heat, keeping the house comfortable. In winter the same thermal mass can store the heat from the sun or heaters to release it at night, helping the home stay warm.

(www.greenhouse.gov.au/yourhome/technical/fs17.htm)



California Energy Commission "What truly sets a passive design home apart from a standard tract home is thermal mass. If solar heat is to be used when the sun is not shining, excess heat must be stored. Everyone has leaned against a sun-warmed brick or stone. It's warm and comfortable and takes a while to cool off. That's thermal mass."

(www.consumerenergycenter.org/homeandwork/homes/construction/solardesign/thermal.html)



US Department of Energy "Thermal mass stores heat by changing its temperature, which can be done by storing heat from a warm room or by converting direct solar radiation into heat. The more thermal mass, the more heat can be stored for each degree rise in temperature."

(www.eere.energy.gov/consumer/your_home/designing_remodeling/index.cfm/mytopic=10260)



Telephone 13 BRIC (13 2742)
www.australbricks.com.au