Bricks for Energy-Efficient Housing

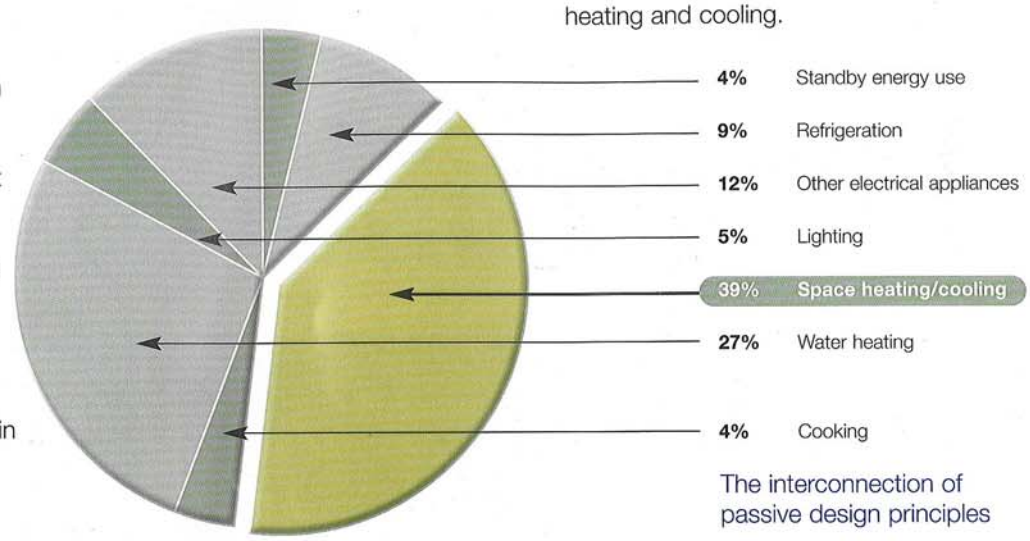
Energy efficiency has become increasingly important to the community, regulatory bodies and industry in recent years. The implementation of regulations at Federal and State level, has led to an increased awareness of the need to reduce energy consumption and lower greenhouse gas emissions through energy efficient house design.

Energy use in the home is a significant factor in our overall energy consumption and a major contributor to greenhouse gases. A 1999 report issued by the Australian Greenhouse Office states that the largest proportion of household energy – a massive 39 per cent – is consumed in space heating and cooling (refer to Your Home Technical Manual, section 4.0 published by the Australian Greenhouse Office, www.greenhouse.gov.au).

This proportion has probably increased in subsequent years with the significant uptake in residential air-conditioning.

According to Energy Australia's submission to the New South Wales Inquiry into Energy Consumption in Residential Buildings (2004), the proportion of homes with air conditioners had grown 21 per cent in the previous decade.

Not only will this impact upon energy consumption, it will also place additional burdens on electricity generation infrastructure especially during peak periods. Designing and constructing an energy efficient house has the potential to substantially and permanently reduce the amount of energy consumed in space heating and cooling.



The interconnection of passive design principles

Energy-efficient house design

Passive design is a well-established and accepted method of harnessing natural forces to reduce household energy consumption and only involves incorporating simple building techniques.

Its interconnected principles act to maintain a level of thermal comfort naturally with reduced reliance on mechanical heating and cooling. The following features work together to passively heat and cool a home.

- Orientation to assist the natural heating and cooling of a home. For example glass areas and shading on the north face will capture the low winter sun access, but exclude the high summer sun.
- Ventilation by capturing cooling breezes and utilising natural air flows from cross-ventilation to cool a home.
- Insulation to act as an impediment to heat flow, so as to retain heat during winter and slow the passage of summer heat through the building envelope.
- Thermal mass to naturally moderate temperature by incorporating dense wall materials that have the ability to act as a thermal battery.