

Architects Advisory Service

Guide to Energy-wise Living

THE ENERGY-WISE HOME HAS EVERYTHING

It saves money, respects the environment and enables you to live comfortably year-round. Three factors can come between you and your comfortable home: the season, the surrounding environment and the local climate. The key to year-round comfort is **passive solar design**. This is where a highly-trained architect carefully combines materials, methods, building form and the sun's natural energy to help keep your house cool in summer and warm in winter.

To achieve Energy-wise living, your Archicentre Australia architect will consider:

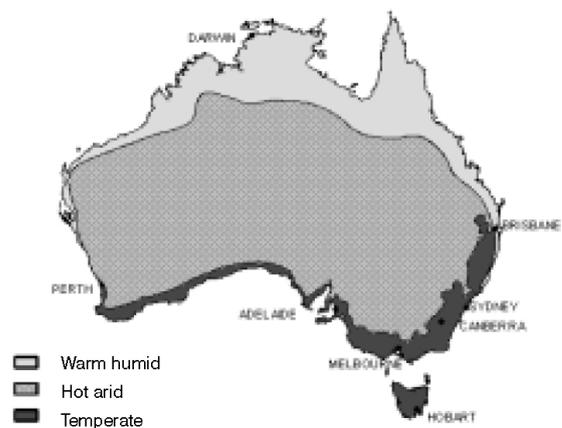
- climatic conditions
- prevailing local conditions
- site orientation
- the zoning or location of the rooms in your home
- materials and construction techniques

CLIMATIC RESPONSE

Australia has three primary climates. These are:

- Hot and humid
- Hot and dry
- Temperate

The climate plays a central role in housing style and selection of building materials.



LOCAL CONDITIONS

Natural features of the surrounding suburb or region also impact on the site. These factors could be:

- slope
- existing trees
- nearby waterways
- prevailing breezes
- views

These factors are intrinsic to the form the building will eventually take.

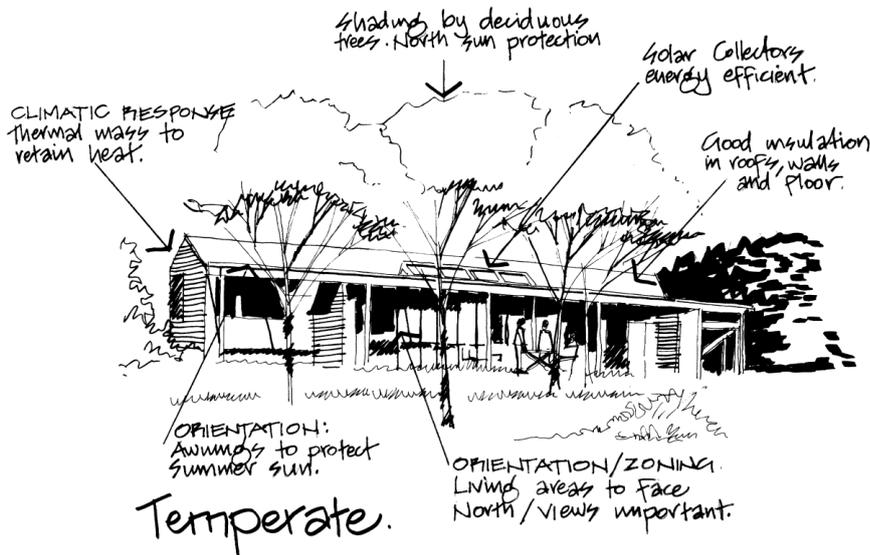
SITE ORIENTATION

The first step in orientation is maximising the northern aspect, where exposure to the sun is best controlled. Eaves and pergolas can be precisely designed to block the summer sun, and still allow the desirable winter sunshine to penetrate.

North-side deciduous trees that shade the house during summer, allow the sun prime access once they have lost their leaves in winter.

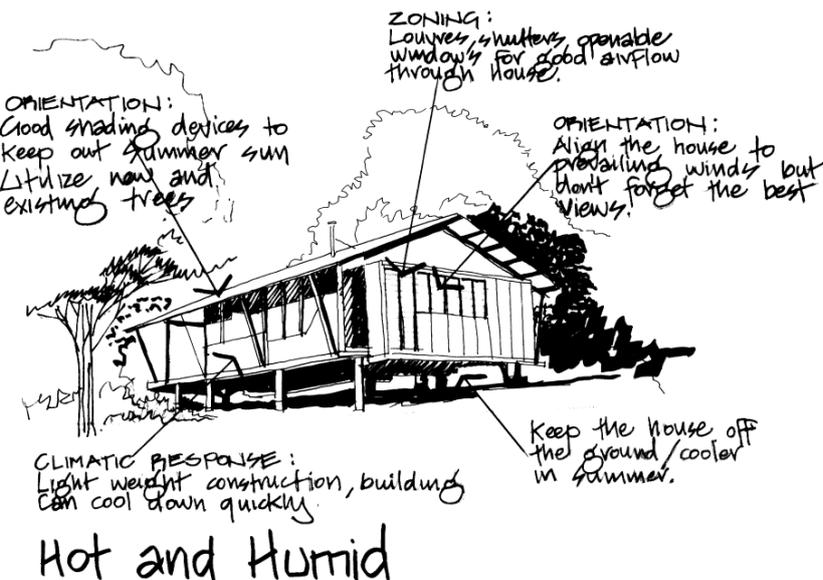
Reducing your exposure to the west will also minimise heat gain via the horizontal rays of the hot summer sun. Verandas are not nearly as useful to the west and east of a house, as a vertical screen or thick planting is the only way to reduce heat load from these directions.

Some sites or existing homes aren't blessed with a pleasant, north facing aspect. Fortunately, your Archicentre Australia architect has the skills to design your home or renovation for maximum solar benefit.



ZONING

It is important to prioritise rooms based on access to views and solar penetration. An open-plan kitchen and living area, for example, should have pole position, while bedrooms or bathrooms require less daylight, as they are largely used for short periods of time, or at night. By zoning your home, unused areas can be closed off, and cooling and heating appliances can be designed for maximum efficiency (ie minimum use).



MATERIALS AND CONSTRUCTION TECHNIQUES

The Energy-wise home requires a complex mix of well insulated, high thermal mass, intelligent glazing and ventilation, all arranged in a way that enhances comfort, anywhere in Australia.

- Insulation is paramount to the energy-wise home experience. Lining the roof, walls and floor can reduce heat loss in winter and heat-gain in summer. Consult an architect about the requirements for effective home insulation.
- Materials with a high thermal mass, like stone, brick or rammed earth, take a long time to heat up and a long time to cool down. A concrete slab, with its high thermal mass, can reap huge benefits from prolonged exposure to the winter sun, radiating warmth at night, when it's needed most. Walls with a high thermal mass should be shaded to minimize a heat load in summer.
- Glass is a very poor insulator. In an energy efficient design think about size, location, glazing type and window coverings. Other important factors include:
 - locating windows away from the western sun, and in some areas, the eastern sun.
 - placing tight fitting pelmets over curtains and blinds to trap air and create a layer of insulation to reduce heat loss on winter nights
 - reducing heat load and glare with specialized glass treatments
 - shading windows externally to avoid direct solar radiation
- Cross ventilation is an important design factor, and entails providing at least two carefully placed and treated openings in every room.
 - Louvres can direct the air flow towards the occupant of the room.
 - High level windows can allow unpleasant hot air to escape, resulting in the drawing in of cool air.
 - Reversible ceiling fans are great in summer and winter. In winter, they push the warmed air down to where you are sitting.
 - Door or window seals to prevent cold air from whistling under your windows and doors.

Energy-wise design is not an add-on feature. These principles come naturally for an architect, developed from years of training and expertise. Simple design techniques can help you achieve a home that is comfortable year-round, use minimal energy and provide a quality lifestyle - no matter where you live - at no extra cost.

