

"Half the windows in the house should face north and, because the sun is high in the sky on the northern face of the building right through summer, a simple overhang will shade your windows. Whereas east and west windows have got low-angle sun coming in, which is very hard to keep out. Passive cooling is best achieved by facing the house the right way and having the right overhang but that doesn't happen with most house designs," Garry says.

It's a sentiment that sustainable design architect Fiona Hogg wholeheartedly agrees with. "We just don't think about our houses properly," she says. "Houses that have got hardly any planting around them, very little eaves and are made of double brick – of course they are going to be a little hot box because it's going to soak up the heat during the day and re-radiate it at night inside.

"A lot of project homes lack proper eaves, which is such a simple technique to shade walls. Having a 900mm eave on a wall in Perth is actually the minimum you should have for summer (on project homes it's about 450) because it means your whole wall is shaded.

"Ventilation also isn't done very well in a lot of Perth houses, I don't think people realise how important it is. We get a sea breeze almost every afternoon and it's one of the best cooling techniques we've got. People aren't using their houses properly in summer. They should close it down in the morning and open it up in the evening to let the cooling breezes come through. A lot of people forget you need to trim a house – a bit like trimming a boat to suit the wind conditions – and adapt it to suit the weather at the time."

Ideally, windows should be placed to pick up cool sou-westers and night land breezes from the east that cool your house down as you sleep. Fiona says the type of windows installed is crucial.

"We typically shove sliding windows on the side of buildings and they're not particularly good at picking up breezes unless the breeze is straight on," she explains. "A casement window is good if you want to pick up the breeze from a particular direction and scoop it into the house. Louvres are also fantastic windows because they have a lot of adjustment in them – they're a little bit more expensive but are a really great way of controlling breeze flow."

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The north-facing solar verandah and deck in a Garry Baverstock home.

## Air-conditioning

On an unbearably hot 38 degree scorcher, there's no arguing air-conditioning can bring welcome relief. Split system units are a pretty inexpensive way to cool one room and have come a long way in terms of streamline design. Evaporative cooling systems, while reasonably priced, are hindered by humidity and the downside is they can't heat in winter. Refrigerated ducted air-conditioning now boasts efficiency scrolls (which superseded inverter technology) – making it 40 percent more efficient – and also has energy saving human body sensors that activate the system after detecting movement in a room, and of course gives climate control throughout the entire home.

Sustainable design architect Garry Baverstock says air-conditioning should be used only as a last resort, however if you must, then consider an evaporative cooler. "Most evaporative coolers have large volume fans and you can ask for it to be reversible so you can use it as a night ventilation fan. That way, instead of blowing damp air into your house at night, it sucks air

out and you open the windows and get cool air coming in," Garry says. "It's better for the environment because it uses 70 percent less energy than a conventional air-conditioner and there are less greenhouse gases being generated. However, in the Perth climate you simply don't need these devices if your house is designed properly."

## Awnings and roller shutters

The main advantage of awnings and roller shutters over window blinds is that they stop the direct heat before it hits the glass. Air-conditioning costs are significantly reduced and the electricity savings will eventually pay for the awning.

Automatic rollup awnings usually overlap the actual window opening by 15mm each side and come with a head box, which the fabric rolls into when not in use. A roller shutter, which also has a head box, is normally installed within the window reveal so it ends up being the same width as the window. Price-wise, Albert

Walmsley from Westral says for a fully installed 2400mm by 1500mm automatic awning, expect to pay around \$470, while a manually operated roller shutter of the same size will set you back around \$770, with \$600 extra for motorisation.

## Glass tinting

In bright sunlight, the heat on glass is intense. For example, every 5.5sqm of glass area will admit 640 watts/sqm of heat per hour – the equivalent of 1hp of air-conditioning. Glass-tinting windows and doors can prove a worthwhile investment, with products like Solar Gard window film having the ability to reject more than 99 percent of the sun's ultra violet filters (the primary cause of fading) and eliminate more than 80 percent of the sun's glare. It comes in a range of colours that can increase daytime privacy, not to mention an optional ArmorGard Safety and Security film that's harder to shatter, reducing the risk of burglary, fire damage or injury should anyone walk into a glass door.