

thermostat monitors temperature and turns on when it exceeds or drops below the required level. Another phase of active solar design is to actually build "thermal banks" into a house - tall vertical bins fashioned from perhaps brick, concrete or rammed earth and filled with granite aggregate. Glass panels in the roof above the bins will catch the sun and store its heat which can

then be circulated through the house by fans.

Now to a moment of truth. In 1997 Perth shivered through the coldest winter ever recorded. There were July mornings with the thermometer locked at zero. The fact, and Jane swears to its veracity, is that the big freeze never troubled them. "We used no artificial heating to keep warm," she claims.



There was sufficient warmth captured from the brilliant winter sun that shone later each arctic-like day to heat up the thermal mass and re-radiate it throughout. A solar house has remarkable stability of temperature. "Our temperature swings are no more than 10 degrees, summer and winter," Jane continues. "In summer, for instance, it's been 28 degrees in here when it was 40 plus outside."

One of Perth's recent summers notched up record high temperatures - another crucial test for the effectiveness of solar designed houses. Until now we have mostly talked about keeping warm in winter. Efficient solar design can be just as effective in warding off the summer sizzle as it is in coaxing maximum heat out of winter sun.

For a start, in summer, the deciduous trees planted in the north which had shed their leaves in winter - letting light shine through the solar pergola and windows - have again blossomed into full cover. The shading they now provide is a first step towards reducing the house's exposure to direct heat - a very important element in keeping the thermal mass as cool as possible.

Control of ventilation does the rest. As cool night air is absorbed by the thermal mass and stored, it can be moved through the rooms by opening windows positioned to provide cross ventilation. The Webb-Wares have the added advantage of their fan system to extract hot air from rooms while sucking cool air from outside.

Choosing the best parts of stories about the benefits offered by solar design is difficult. On one hand is the aspect Jane told us about of just being thoroughly comfortable. The next best thing would be what you save on power costs.

"It's difficult to calculate exactly," says Jane, "but I

wouldn't disagree with the estimated savings of 60 to 80 per cent that have been calculated for similar sized houses. When you consider we have no air conditioning and only one open fireplace, which we rarely light and then more for effect than warmth, you can see where the savings are. Our power costs are mainly for cooking, lighting, and sometimes boosting the solar hot water system."

Architect Michael Murphy of Baverstock Murphy and Associates weighs in with thoughts from an expert: "It's sad that the perception of a solar house is often that appearance will be sacrificed for function. Nothing could be further from reality. The design principles we go through - orientation of the building, windows, high thermal mass, insulation etc - have no bearing at all on the look of the house."

The Webb-Ware house - a thing of grace and beauty - adequately demonstrates this point

"There's a further misconception," Michael adds. "It's the cost factor when building. The only extra expense in doing it properly is that you need to employ an architect. An architect will apply a science now well established."

He continues, "It's all science-based. Take, for instance, needing to know exactly how big windows should be and where they should be positioned on all elevations of a house - north, south, east, west. After many years of calculation and practice, the optimum percentage of glass that should be exposed has now been established."

It has been estimated that the cost of solar design might add as little as five per cent to the cost of building a home. Weigh that against those huge savings on annual power costs and you will be swiftly persuaded to join the brigade of PSPs or ASPs.

There's an old song which goes something like this: *And that lucky old sun who has nothing to do but roll around heaven all day.*

Not so! Old Sol has plenty to do for us, including helping us help the survival of our planet. Solar design is part of the aid process and also eases our own earthly burden considerably, and if you have been questioning the value of employing it in your next home, the question should not be "Why?" Rather, it should be "Why not?"

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In the next edition of Homes & Living we look at two more applications of solar house design - a town house on a small block and a large country farmhouse.

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Below: Sunlight streams into the informal living areas at noon, warming floor tiles and lighting up interiors on a winter's day

