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PASSIVE solar designs have been around for decades in domestic architecture, mainly in the bigger homes built by people seen as innovators.

They have never really caught on in the mass market though they have a well-proven track record, not only for winter warmth but for comfortable living in summer.

"There is no doubt about their functional value and their big saving in energy bills for space heating and cooling," said architect Garry Baverstock, of Tecproducts, consultant for the Bristle-Whittakers solar energy ideas home open in Kardinya.

"But the public seems unaware of what can be achieved at minimal cost. This is what we set out to do in Le Souef Drive, to show a traditionally-built, double-brick home that bristles with solar ideas.

Pioneers

"Some have been used since pioneer days while others are new to project housing. Here we have aimed at the \$40,000 to \$50,000 market in a scientifically-designed house with glass on all elevations.

"We have glass to the east and west, but no more than 4 per cent of the total wall. It is mostly in glass bricks which are better thermally than sheet glazing.

"The north wall which exploits the low angle of the winter sun is 54 per cent glass, the maximum recommended for year-round comfort.

"We ran off 40 computerised programmes with dimensions of a similar house and optimised the desirable area of glass facing each direction, for heat gains and losses.

"You can have too much glass to a wall

which will overheat rooms by day and cool them down quickly at night. With the extra brickwork to the north the internal wall acts as a storage bank and radiates heat back into the room by night in winter."

Mr Baverstock said that the computer had shown that the area of glass on the south wall should be limited to 9 per cent. Windows were there for light and natural ventilation of bedrooms, catching the cool sou-wester of a summer afternoon.

The windows did not have to be big because the main source of light and winter warmth was from clerestory windows facing north on the roof ridge. A front veranda kept the early morning and late afternoon summer sun off the facade, but its main role was to keep the ground cool and minimise heat intake.

Windows under the veranda were recessed to funnel in the cool summer breeze. The carport at the end was like a giant funnel, forcing cool air through a doorway and right through the house by night and flushing out the heat of the day.

The clerestory win-

dows had been used in conjunction with internal windows to get winter sunshine directly into bedrooms on the south side. By summer this glazing was protected by roof overhang but was still a main light source.

Formal sitting and dining areas had the walls of glass to the north and here the terracotta floor tiles got the winter sunshine, acting as thermal banks. They soaked up the warmth by day and radiated it back into the room by night.

Comfortable

The house could be comfortable most nights without having to light the open fireplace, the emergency heater, when there was a succession of cold, cloudy days. The computer showed that the masonry mass had a heat carryover period lasting at least two days.

The kitchen in the display house has a warm and pleasant work space and the fittings the chef would expect in this budget range. The bonus is the close involvement with the garden games room, a kit room with a timber grille on top of a glass roof.

This has been designed so that the handyman can put it up at weekends. Timber louvres have been angled so that the roof is like a conservatory in winter but almost completely in shade in the heat of summer.

The winter warmth from this garden room can be drawn into the home via the kitchen, formal areas and utility room.

The home has the usual four bedrooms and two bathrooms. The children's bathroom is convenient to their bedrooms but behind the laundry, making it handy for people returning from the beach.

The parents' en suite includes a spa bath and above this is a big picture window to the north, a source of light and winter warmth to the whole suite.

The construction of the house looks traditional enough. But unseen is the insulation in cavity brick walls and the extra insulation over the ceilings for the dark tile roof.

The facade makes a play of old-world detail in corbelled flat arches and of a free-standing gable arch. Inside there is corbelling, shelving, stepping and slit openings in the pastel, Tudor-style faced bricks.



The front veranda of the solar energy ideas display home at Kardinya keeps the early morning and late afternoon sun off the facade but, more importantly, keeps the ground cool in front of the bedroom windows.

Model of sound solar principles



The kitchen was planned by an expert and would please all chefs.



The open fireplace will only have to be lit during a series of cold, cloudy days.