



The entry to the home is via a bridge over a reflection pond, helping to cool the afternoon summer breezes entering the house. The drought tolerant front garden featuring succulents, fountain grasses, liriope and palms with water feature, provides a counter point to the sleek and angular exterior (**this page**). Reading room off the entry chamber which functions as an airlock, keeping heat in during winter and out during summer, when opening the front door. The interior décor is clean and contemporary, yet robust: dark stained timber contrasts the white walls; lamps by Pierre and Charlotte (**opposite page**).



Aesthetics and sustainability were high on the list for the owners of this new home in Melbourne. The result - sleek classic lines and 75% energy self-sufficiency, at only 8% extra.

“Thermal mass” is not a term to immediately conjure up images of stylish living. Neither is “solar power”. Yet environmentally friendly homes today not only integrate such elements without detrimental effect to the aesthetic qualities of the design, but by their very nature are beautiful and engaging environments in which to live. By utilising natural factors, in particular light, to maximum effect and by ensuring maximum insulation, the home is inherently comfortable, relying less on external influences to create a pleasing environment.

Sustainable homes today are not about applying “green” features in an “add on” way, but rather seamlessly incorporating these elements within the design of the home, in much the same way that wiring and plumbing have been hidden from view for decades. Architects, designers and builders have always been faced with the challenge of producing designs that meet aesthetic requirements as well as being functional, and the new environmental challenges have added another dimension to functionality.

Home owners, acknowledging the cost efficiencies of an environmentally sustainable home, as well as some responsibility for protecting the environment, are demanding that these features be included in their brief. Yet they also wish to hold to their same exacting design expectations. Fortunately, as such features as water tanks, grey water systems, solar heating and electricity, shade cloths, and insulation have become more widely used, not only has cost reduced, but practitioners are more familiar with their application and it becomes less of a cumbersome problem to deal with.

A company that has been thinking about sustainable features for twenty-five years is →

A Beautiful Set of Numbers...

The wide arch and fireplace delineates the reading room from the main living area, and gives definition to the open plan area (**this page**). The sunspace roof windows have remote controlled external blinds to prevent the space overheating (**opposite page, left**), whilst the southern windows have been glazed with Low E double glazed panels to prevent heat loss. American Oak dining table by Terrance Conran, with timber framed chairs by Pierre and Charlotte (**opposite page, right**).



a beautiful set of numbers...



Sunpower Design. Andreas and Judy Sederof are more than practised in how to make a beautiful self-sufficient home. “Our aim is to design buildings that become an investment for future generations, inspiring clients to make a difference and encouraging active client participation in the decision-making process.” Innovative and creative solutions to design and site issues integrate the engineering, building design, hydraulic and renewable systems, resulting in buildings that minimise the environmental impact of construction and significantly reduce energy consumption.

These principles were the basis for this elegant home by Sunpower Design in Elwood, an inner bayside suburb of Melbourne, where the salient visual feature is classic contemporary design. However, an equal imperative in the design process was the incorporation of sustainable features, which have contributed in a major way to create a house that doesn’t have to work too hard at being beautiful.

In terms of energy, it is 75–80% self-sufficient, yet it is as sleek and comfortable as they come – not at all the quaintly awkward conjured up by that term “self-sufficiency”. Most of the factors responsible for this figure are imperceptible – the mega-insulation of the Hebel walls and double glazing, and the slab which gives the thermal mass. Proper orientation and siting of windows maximises light and winter warmth and minimises summer heat. There is no need for air-

conditioning or excessive heating to compensate for a poorly orientated or ventilated house. “Even during the hot summer we have just been through, the house was never unbearable,” notes the owner. “It takes a little bit more effort than flicking a switch – it is necessary to draw all the shades before the house heats up, and then open the windows in the evening to allow for evening breezes.”

No more than 8% was added to the cost of the house, which includes a grid interactive photovoltaic power system at a cost of \$19 000 (with a government rebate of \$4000), providing much of the home’s electricity requirements. These PV panels are more cost effective now than when installed, and the owners would recommend adding as many PV panels as possible. “Since we completed our home two years ago, the cost of the PV panels has reduced significantly, making them even more cost effective.”

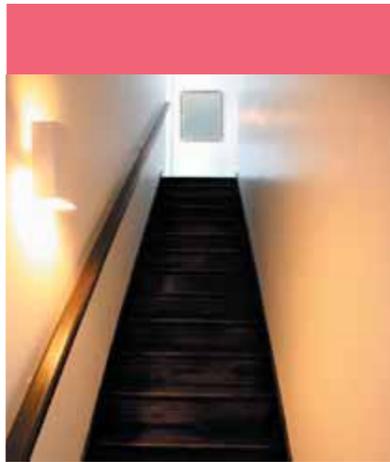
However, all these elements had to fit into the owners’ aesthetic vision, which was for an open-plan home with clean, classic lines. Having renovated before, the owners have developed their architectural taste and knew exactly what they wanted. “We like clean, square lines with a classic feel that references 1960s architecture; something that would age well, hence the white walls.” With an open plan design, acoustics were very important, so there are acoustic layers between the levels, as well as the fantastic →



An Agave attenuata in the front garden (**this page, above**), and (**below**) Bobbi the dog contemplates the goldfish in the water feature by the front door. Linen drawers double as seating in the upstairs hall/play area (**opposite page**).

acoustic properties of the Hebel blocks. The house that was demolished to make way for this was only twenty years old. It had no redeeming architectural features and was an environmental nightmare with poor orientation, so there was no benefit in contemplating adapting it to current requirements. "It seemed at the time that we were being quite extravagant – knocking down what may have seemed to some a perfectly good house," notes the owner. "As recently as 2004, it was quite radical, but now the imperative to build more responsibly has gathered pace and more people seem to appreciate the cost benefits, financial as well as environmental." And, perhaps most palpably, producing a home that is beautiful and inviting.





Specs:

Sunpower Design 9386 3700
www.sunpowerdesign.com.au
 Furniture:
www.pierreandcharlotte.com

Sustainable Materials:

New Age Veneer in Charco, used on the cabinets, is sourced from plantations in Europe and figured to resemble old growth timber species. The polyester insulation has 60% recycled PET content. The kitchen also has a Kitchen King recycling system for compost and general garbage.

Thermal Mass and Insulation:

Thermal mass is provided by the concrete slab and Hebel AAC blockwork, chosen for its low embodied energy and its inherent insulation and acoustic properties. Polyester batts were installed in the walls and ceiling to provide R2.0 to walls and R4 to ceiling. Air Cell was used as a roof blanket and due to its excellent reflective properties, has increased the R rating by up to R1.0.

Glazing

All windows and glazed doors are double-glazed with 6-10mm argon gas space between panels and weather stripped to prevent draughts. The south facing sunspace has been glazed with Low E double-glazed panels.

Shading

Sail shades have been provided to the north-facing deck, removed in winter to allow maximum solar gain. The west and east windows have pull-down blinds (Verti Screen by Ace of Shades) as well as a remotely controlled external blind on the sunspace roof windows (Soltis Ferrari).

Ventilation

Maximum usage of cross flow ventilation has been allowed through strategic window placement and by most windows utilising casement mechanisms which increase the size of the penable window for maximum summer ventilation. Doors and windows are heavily draught-proofed for winter comfort.

Appliances and Services

All light fittings have been designed to accommodate compact fluorescent globes to reduce energy usage. Low voltage halogen lights have been minimised because of their high energy usage and the gaps they create in the insulation.

Rainwater Collection

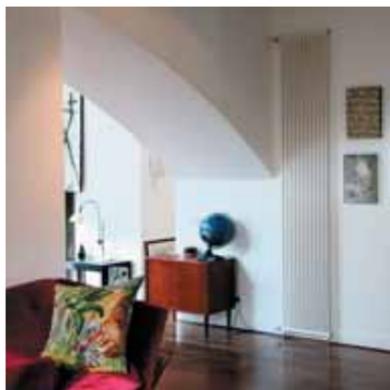
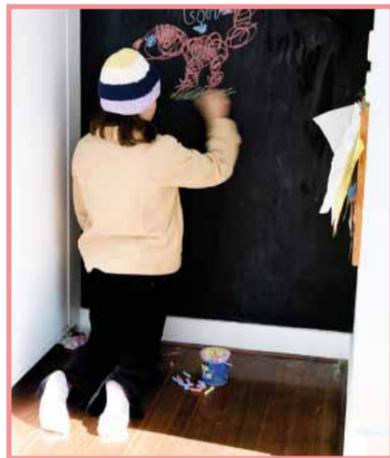
The house has a roof area of 250m² and rainwater is channelled into 15,000 litres storage for most of the domestic use.

Solar Hot Water

An Edwards LX 400 solar hot water unit with 3 panels and 14 risers boosted by a Rinnai instantaneous gas unit. A Greenheat hydronic heating system (supplied by Hydrotherm, Thomastown) utilises the hot water in the solar hot water service to provide radiant heat to the entire home.

First Rate Evaluation

The home achieves a First Rate Rating of 37 points. A Five Star rating is achieved by 7 points – this building way exceeds this figure to give approximately 6.5 star performance.



This page, from the top:
 Warm air travels up the stairs and escapes through strategically placed windows on the upper level. The rear garden has an air of tranquil luxury, but the extravagance of a pool is offset with a massive 8000 litre water tank hidden under the lawn, in addition to greywater treatment tanks. A pool cover in warm weather greatly reduces water waste through evaporation. The blackboard is a fun way of reducing paper waste for messages and notes. A gas boosted solar hot water service is provided with a link to the Greenheat hydronic heating system which utilises the hot water in the solar hot water service to provide radiant heat to the entire home.

Smart Housing



Sustainable HOMES

Environmentally sustainable
 This means reducing waste, water and energy use.

Socially sustainable
 This means a safer, more secure and comfortable home.

Economically sustainable
 This means cost savings over the life of the home.

For more information go to:
www.sustainable-homes.org.au
www.smarthousing.qld.gov.au