



Ventilation: Superior ventilation is achieved via mechanical and natural means. The house is not fitted with air-conditioning, therefore the main mechanical method used is ceiling fans. These blow warm air down in summer and gently up in winter and are fitted in all main living areas and bedrooms. But for the most part, the house relies on natural methods of ventilation. The second-storey landing area uses a decking-style floor, allowing warm air to vent through, heating the upstairs in winter. The lounge is fitted with a small window that vents into the garage, allowing cool southerly sea breezes to blow through the house when the south-facing garage door is open. Construction of the house also focussed on superior draft-sealing of all external doors, windows, fans (ceiling/wall/rangehood) in order to reduce changes in temperature.

Insulation: A number of insulation treatments are included to provide occupants with the most comfortable temperature year-round. The most apparent is the high-performance double-glazing that effectively provides the same performance as triple-glazing. The windows are filled with argon gas to further reduce heat loss and their effectiveness is

enhanced by their locations, which maximise winter heat and minimise the intensity of the summer sun. High-rated insulation is also installed in the walls, ceiling and roof area.

Thermal Mass: One of the house's most striking features is also its most important. The polished concrete floor not only lifts the overall look of the house, it plays a vital role in keeping it cool in summer and warm in winter. The polished slab provides a highly-effective thermal mass that ensures the winter sun is stored and re-radiated into the spaces. Due to the summer shading of north windows the floor remains cool in summer, helping to reduce the overall temperature throughout the house. Perhaps more subtly, timber window and door frames ensure minimal thermal loss and gain.

Third Ecology has taken the design of the house beyond the mere materials used to construct it. A whole-of-life approach has been central to the building process, mirroring, by the way, Toyota's process for building Prius.

Sustainably sourced and other recycled timbers were brought in for use in construction and feature throughout the house, including all structural

requirements, flooring, decking, feature stairs and fence screening boards

Saving water is perhaps the most popular way to improve sustainability, but it is particularly significant with this site as neither house requires a mains supply for any of its water needs.

Aside from water-efficient fixtures that reduce consumption by more than 50 per cent, six 4500-litre water tanks are located under the driveway and are fed directly from the guttering and downpipes.

Captured water is filtered and undergoes UV sterilisation before a high-power pump delivers it to all fixtures and taps when required.

Water usage modelling has indicated that 100 per cent of required water can be drawn from the tanks, though the tanks are linked to the mains for extended dry periods.

Whether you are building a car or a house, the environment is now a key consideration for everyone. Like Prius, Third Ecology's home in Barwon Heads highlights how clever thinking can make a big difference.

Visit www.thirdecology.com.au for more information on sustainable architecture.



Left: Windows are recessed to reduce the impact of summer sun; Below: A retractable awning allows winter sun in and reduces its intensity in summer; Bottom left: Energy-efficient appliances and lots of natural light reduce power consumption

Researching the green energy ratings of domestic appliances and fixtures is part and parcel of any new purchase. In recent years the focus has switched to houses such as this award-winning seven-star effort from Third Ecology.

Located in the picturesque Victorian beachside town of Barwon Heads, this stylish, funky-looking beach house represents the very latest in eco-friendly housing.

Winner of the GreenSmart Design Concept Award from the Housing Industry Association (HIA), the house (and the other it shares the block with) achieves a seven-star energy rating – remarkable given the struggle by two-storey dwellings to achieve even five stars.

Designed and project managed by Geelong-based company Third Ecology – which specialises in sustainable architecture – the house focuses on the design principles of the HIA's GreenSmart program (see breakout opposite page), including orientation, ventilation, insulation and thermal mass.

Rather than presenting one overwhelming green idea, the house mixes a variety of sustainable design elements to form a unique dwelling. These include: **Orientation:** The living areas and associated windows are orientated due north so the house captures the winter sun and retains its heat – reducing the need for alternate sources of heating. There has been minimal use of windows facing east, south and west in order to enhance natural light and cross-ventilation. East and west-facing windows on the top storey are fitted with L-shaped surrounds to reduce the impact of summer sun. A retractable awning above the outdoor entertaining area shades the afternoon sun when extended in summer, while allowing the winter sun to penetrate the house when retracted.



The orientation of the master bedroom maintains a constant temperature year-round



The house's polished concrete floor plays a key role in regulating the indoor temperature



Green Your Acre

GreenSmart is an initiative from the Housing Industry Association (HIA) that focuses on educating builders, designers, manufacturers and consumers about the benefits of environmentally responsible housing.

Here are some GreenSmart tips to make your home more sustainable:

1. Incorporate shading structures or eaves to minimise the entry of summer sun and to allow penetration from winter sun.
2. Seal draughts around external doors and windows and install self-sealing exhaust fans in bathrooms, toilet and laundry areas.
3. Select window glazing – e.g. single, double, tinted – that achieves optimum glazing conditions for your climate. The correct placement and selection of windows will also help maximise cross-ventilation.
4. Install four-star toilets and water-efficient tapware and shower roses.
5. Purchase renewable energy for household use or install photovoltaic systems where your budget allows.

Visit www.hia.com.au for more GreenSmart information.