



## Trevor Pearcey House

Green Star / Green Star Projects / Green Building Case Studies

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### The project at a glance

- Energy use reduced by 52 per cent compared with pre-retrofit, saving approximately \$20,000 per year
- Water consumption 85 per cent less than the Canberra average, saving around \$2,500 per year
- Building rated in top 11 per cent for user comfort and satisfaction
- Complete retrofit delivered on conventional budget of \$1,700 per m2
- 6.2 per cent perceived improvement in productivity, equivalent to more than \$300,000 per year in salary costs.

*How does a Green Star building perform once the fanfare of its Green Star certification has died down? The Green Building Council of Australia revisited Trevor Pearcey House in the ACT to find out.*

In 2007, Trevor Pearcey House was awarded a 6 Star Green Star – Office Design v2 rating for what was then a ground-breaking retrofit undertaken by Australian Ethical Investments (AEI). The retrofit overhauled the existing 1980s environmentally-hostile building and transformed it into a showcase of environmentally-sustainable design.

Howard Pender, AEI's Director and the driving force behind the project, sums up the improvement: "the existing building was akin to keeping milk fresh by storing it in a cardboard box. The refurbished building is an esky."

The operational performance of the upgraded building confirms Pender's point. Energy use has been halved, and water use is now 85 per cent less than the Canberra average, delivering combined savings of \$22,500 per year.

The big story, though, has been the boost to AEI's productivity. An internal survey of staff perceptions found they feel healthier and more comfortable in the building, and have reported 6.2 per cent increase in productivity. Howard Pender estimates this small productivity improvement adds up to a big benefit: around \$1.5 million of extra value over five years.

To ensure the retrofit aligned with the principles of Ecologically Sustainable Design (ESD), AEI assessed the building using Green Star and implemented 'green customised' construction management contracts which tracked environmental targets alongside time and budget processes at each construction meeting. Third party certification was particularly important for AEI as it secured independent validation of the company's environmental claims as well as extra recognition of its role as an environmentally-responsible leader in the industry.

"Even before we'd settled on the particular refurbishment site, we knew we were going to aim for Green Star accreditation," Howard Pender says. "We had a strong desire to maximise staff amenity and minimise our environmental footprint. The Green Star tool was invaluable in pursuit of these aims."

Importantly, the retrofit of Trevor Pearcey House was completed on a conventional budget of \$1,700 per square metre, demonstrating that neither cost nor building age are restraints in delivering world's best practice in green building design in Australia.

"Trevor Pearcey House was one of our first Green Star projects and is still a favourite as it showed that exemplar environmental performance can be achieved on a conventional budget," says Warren Overton, Managing Director of Viridis E3. "We have been fortunate to be involved in the operational assessment of the building and have been impressed by the ongoing commitment of AEI to ensure the building continues to deliver substantial environmental savings."

"Nearly five years on, the building still continues to inspire others to do the same," Overton says.

### What Trevor Pearcey House achieved

#### Management

The project was awarded points for post-construction commissioning. This process identified mechanical errors such as exhaust stacks opening during winter and the installation of a faulty hot water pipe. Without commissioning, both of these issues would have led to wasteful heat loss and higher energy bills.

AEI has also conducted formal 'how the building works' sessions for staff and developed a detailed building user's guide. This approach has improved staff awareness of the building, boosting satisfaction levels and ensuring the building operates to its full design potential.

#### Energy

The retrofit slashed energy use in the building by 52 per cent compared to its estimated previous performance. This is, however, less than the predicted reduction of 67 per cent. AEI believes this is largely due to differences in the real-world performance of the building's natural ventilation system as opposed to the optimal conditions it was modelled upon.

Halving energy consumption is still an impressive feat, the bulk of which has been achieved through double-glazed windows, which have cut heating demand by around eight per cent, T5 lighting, which has halved lighting energy use, and new insulation, which has reduced the cooling load by 24 per cent. Trevor Pearcey House is a real life demonstration of how the latent environmental potential of existing buildings can be unlocked through sustainable retrofits.

#### Indoor Environment Quality (IEQ)

Post occupancy evaluation of Trevor Pearcey House has placed the building in the top 11 per cent for user comfort and satisfaction. Furthermore, the focus on achieving good IEQ by reducing levels of indoor pollutants, improving ventilation and ensuring good levels of daylight has delivered a boost to productivity calculated to be 6.2 per cent. This increase in productivity translates to a financial benefit of \$328,600 per year – or \$1.5 million over five years.

#### Water

Following the retrofit, water consumption in Trevor Pearcey House has dropped to 85 per cent less than the Canberra average. This was achieved through simple measures such as replacing single flush cisterns with dual flush versions; these reduced water consumption by 56 per cent. Upgrading urinals with waterless urinal cartridges and an automatic flush twice daily cut water consumption in urinals by a whopping 96 per cent. The installation of two tanks to supply the remaining toilet water demand from captured rainwater also saves thousands of litres of water a year.

#### Materials

Careful demolition work resulted in 80 per cent of construction and demolition waste being either reused or recycled. This reduced waste sent to landfill and demand for new materials.

Innovative uses for reused materials included using shading panels, steel mesh and support frames from the existing mechanical services to make a bicycle enclosure, while the old metal-backed computer floor tiles were used to create artworks around the building.

Materials that couldn't be reused onsite were used elsewhere. Five tonnes of carpet was reused in local houses and motel, two tonnes of workstation partitions and one tonne of light fittings were resold through a second hand dealer, more than one tonne of plasterboard was reused in a shed and one and half tonnes of ductwork were recycled as scrap metal. Trevor Pearcey House is a practical demonstration of making more with less.

