

The perfect balance

The home's roof-mounted solar photovoltaic system has earned Elizabeth and John over \$200 in credit from selling energy back to their electricity retailer.



A future-proof home at the Aldinga EcoVillage that did not cost the earth

Early arrivals at a new and pioneering eco-village south of Adelaide, Elizabeth and John Heij were very clear about the type of home they wanted to build.

"We wanted to make sure the house was maintenance-free, easy to clean, created the minimum possible bills and had the smallest possible impact on the environment," explains Elizabeth. There was one other critical factor. Including the cost of land, it had to be designed and built for around the sale price of the modest and environmentally unsustainable suburban home in which they lived at the time.

"The message we wanted to get across is that you can do it on the budget of an ordinary suburban house transfer," she says. "To see big magazine spreads of huge, lush houses that cost up to several million dollars, with people saying they're designed for sustainable living amazes me. I wonder do they really understand what sustainable living means."

And do it they did, with the help of Adelaide's innovative Energy Architecture, led by John Maitland and project architect Ben Mountford. The result is a compact, creative, inspiring and affordable home that is a landmark property at the Aldinga Arts EcoVillage. According to the Royal



Elizabeth and John Heij's home is packed with environmental features including recycled timbers.



Australian Institute of Architects **the house has an environmental footprint less than 25 per cent of the Australian average and won a Sustainable Architecture Merit Award** in the residential section of the 2006 Royal Institute of Architects (SA) Awards.

"I'm delighted to say that both John and Elizabeth were willing to take a bit of a punt (on the design)," says John Maitland, a driving force with the eco-village which is being built on previously-farmed coastal land 40 kilometres south of Adelaide. "It is quite a different piece of architecture to most of the other buildings down there...different to anything

really," he says, noting particularly its "quite brutal" canted galvanised iron and deep blue sheet box form. "The house itself ... is a really lovely mix of fairly austere external skin and this warm interior which comes about through finishes and their own furnishings."

Certainly moving to Aldinga has meant no sudden conversion to sustainability principles for John, a retired nurse, and Elizabeth, a biological scientist who runs the CSIRO's online Sustainability Network. Increasingly concerned about modern lifestyles, their initial efforts went into improving their "poorly designed, badly oriented, uninsulated,

three-bedroom, brick-veneer suburban box." They cut their energy consumption to below 9kwh per day (less than 70 cents on a combined day-night tariff) and 25 litres of water per person per day. But they realised to do more would require a major retrofit and represent gross overcapitalisation of the 1970s home. Then John spotted an advertisement for the Aldinga Eco-Village.

Their purpose-built home, completed in late 2004, is a showcase design packed with environmental features, many of which are required by village by-laws. But it has its own standout elements, not least the innovative conservatory along the eastern

Passive-transfer hatches distributing heat from the glass house around the house



The glasshouse is the home's only source of heat.

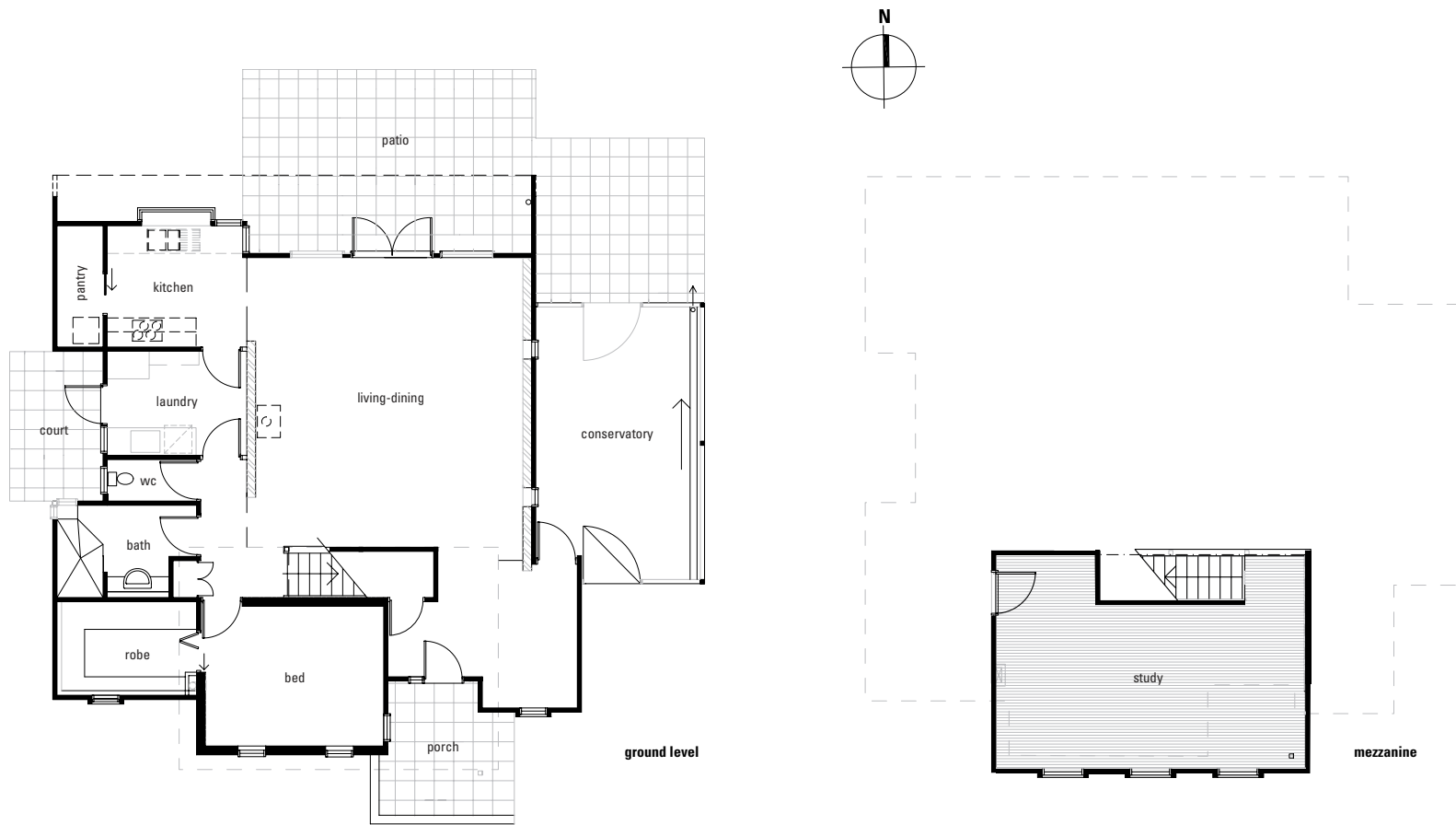


side, its outside walls of polycarbonate sheets modelled on the glasshouses at the Plant Research Centre at Adelaide University's Waite Campus. Forming a multi-purpose space (breakfast room in winter, glasshouse for seedlings in spring and clothes drying area) the conservatory's clear walls not only create unusual ambience, but trap massive amounts of heat in winter. The heat is distributed to the rest of the home via four passive-transfer hatches, which pass cool air out and warm air in. It's the home's only source of heat and has worked exactly as they hoped.

Dubbed the Heij-Shed (the couple's Dutch

surname is pronounced Hay), the house has a reverse brick veneer construction. Light-weight rendered cladding and galvanised iron provide the outside skin, and a double layer of enclosed air and bulk polyester insulation, and major internal walls of concrete-filled besser blocks, provide further thermal mass. Located on a north-facing and sloping 600 square metre lot, the bedroom is sunk one metre into the earth on the south side and topped by a mezzanine study. An in line recirculation duct distributes warm air from the mezzanine study to the bedroom, and double-glazing to the south provides a cool bedroom in summer and warm

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working area in winter.

All service rooms (walk-in robe, bathroom, toilet, laundry and pantry) are lined up together on the western wall of the home, helping to shut the core of the house off from summer afternoon heat. The garden bay window in the north-facing kitchen extends beyond the rest of the house, inviting winter sun onto indoor herb planters, while two casement-style windows open onto an outdoor patio to allow cooking to be easily moved outside in summer.

The home's roof-mounted solar photovoltaic system has delivered a sizeable credit on the couple's energy bill, with their entire energy cost for the first year in the home just \$10. They are

currently over \$200 in credit from selling energy back to the grid. **Rainwater is collected from the house and garage in two in-ground concrete tanks plus several smaller above-ground overflow tanks (50,000 litres total), supplying all domestic and garden needs.** It's enough to nourish a thriving vegetable garden despite the drought, though this year saw very little surplus produce.

Not everything is or has been perfect. The building took twice as long as planned, and the couple has been disappointed by how slowly the whole eco-village is developing. In their own home, they've also struggled with a suitable grey water

solution. Reluctant to commit to the "overkill" costs of the only approved biological treatment system available in South Australia, their recycling is still being done literally by the bucket. "So there are some things to work on," Elizabeth says. "But I'd say they're relatively minor."

Both sides worked to forge a balance between design, practicality and budget. "We held them down to practical things about costs, environmental footprint, maintenance and the cost of ongoing living," Elizabeth says, "and I think we actually constrained them (artistically) in some ways." John Maitland agrees the design could have been pushed "a bit further" if there had been more scope, but

The garden bay window in the north-facing kitchen extends beyond the rest of the house, inviting winter sun onto indoor herb planters.



he's not complaining. "It was a tight budget for the accommodation they wanted and the extent of the sustainability features, but we're really happy with the outcome. We don't view budget as a constraint, rather a parameter within which we design and we need no encouragement to weave sustainable principles into the design."

And it's delivered the Heijis all their key objectives. "We've got a much nicer home that's more compact, performs far better environmentally, and which came in at around the same cost we sold our old house for," Elizabeth says. "And now the savings (on energy, water, and food) are cutting in. I must say I feel quite future-proof in that sense." ←

Designer: Energy Architecture. www.energyarchitecture.com

Builder: Oakridge Building Services

Location: Aldinga Arts EcoVillage, SA www.aldinga-artsecovillage.com.au

Photography: Energy Architecture & Rebecca Cowling

- Features:**
- 280 litre Beasley solar hot water system
 - Dual 1.65kW Mitsubishi battery backup and 1kW grid connected Kaneka solar photovoltaic system
 - 50,000 litre rainwater tank capacity
 - Plumbing for future installation of a grey water system
 - Double-glazing and floor-to-ceiling curtain system
 - Concrete, concrete blocks, slate, and granite to provide thermal mass inside lightweight rendered blue-board and galvanised iron shell
 - Air Cell insulation
 - Slate, bamboo, and recycled jarrah floors and staircase