

design

The green team

Ecologically sustainable living is as much about architectural design as it is about lifestyle, writes Jane Burton Taylor.

THERE was a time when the concept of reducing household bills and looking after the environment meant taking shorter showers and recycling shopping bags. Now there is a more fundamental way to cut costs and reduce waste through home design.

Husband and wife Dr Robert and Professor Brenda Vale, internationally recognised authorities on cost-effective sustainable housing and co-authors of *The New Autonomous House*, about building their own environmentally friendly home, kicked off a whistlestop national lecture tour in Sydney last month. The aim of their House With No Bills tour is to influence the way architects design houses so that environmental issues become a priority on a par with aesthetics.

"We are hoping to persuade architects that the performance of a building is just as worthy of their attention as the appearance," Dr Vale says.

Caroline Pidcock, who heads a Royal Australian Institute of Architects committee on ecologically sustainable design, says Sydney architects are astounded by the Vales' work and hungry for the knowledge they could gain from the couple's extensive experience. The Vales built one of the first houses in Europe to supply its own energy via a mega-backyard solar collector. Now they've headed south, with Professor Vale teaching architecture at the University of Auckland and Dr Vale working as senior research fellow of the university's Sustainable Design Research Centre.

Professor Vale says that, in order to have a house with no bills, "You have to change your behaviour first. Switch off lights, use the fridge the right way,

[do] not take 20-minute showers, use the washing machine full and on a cold cycle."

She asks her students to calculate how much energy they use by adding their energy and gas bills and dividing the figure by the number of people in the house. She then asks what they could change.

Behaviour change is crucial to the Vales' message, but the way a house is put together is the key. "Initially, you can do a lot with good insulation and ventilation," Professor Vale says. "In Auckland we've insulated a house to twice the norm. This not only [keeps out] cold in winter, it stops the rate of heat transfer in summer."

The next step, she says, is to introduce a solar water heater. "In Australia and New Zealand, there is no reason we shouldn't heat from the sun."



Energy in the UK: the super-efficient Hockerton Housing Project.

Then it's a case of cutting down on the energy consumed by installing low-energy lighting and appliances, working out how to generate energy on-site, perhaps by using photovoltaic panels (which convert solar energy to electricity) and installing systems to collect and store rainwater and process waste.

Pidcock says there are many lessons to be gleaned from the Vales' work, but their ideas have to be adapted to the Australian population and climate. She says Vale designs are austere by Australian standards.

"[Architects such as Queensland-based Lindsay Clare] do beautiful environmentally friendly houses.

[Clare] comes from a completely different climate to the Vales," Pidcock says. "A lot of Australians want to feel they are outdoors, or close to it. In the UK people don't want to go outside, and the houses tend to be enclosed."

Pidcock says Australian architecture is experiencing a seachange, which can only be encouraged by the Vales' visit: "Australian architects will take [environmental considerations] on board as long it doesn't spoil the design. But if you really take it on board, it will inspire the design."

Making healthy buildings

One of the Vales' earliest designs was for a medical centre in Sheffield, in Britain. "[It was] the grim north *Full Monty* territory," Professor Vale muses. "We promised to cut energy bills by 80 per cent at no extra cost."

This was achieved with good insulation and low-energy lights. The building was designed to absorb solar gains via roof windows and was heated solely by a central wood-burning stove.

"It was the first example of a healthy building. Staff told us the story of one man who sat around the fire, said he felt better and went home before his doctor's appointment."

The Vales later ventured into welfare housing, heating a three-bedroom house for the cost of a pint of beer a week.

They designed their own home in an 18th-century style, minimising CO₂ emissions with energy conservation measures. They kept

the structure simple, buying local products where possible and using insulation more than 250mm thick. Photovoltaic panels on a south-facing pergola provided energy, and rainwater was stored in 20 recycled containers under the house. A glass conservatory provided heating. The lowest temperature recorded in the house was a mere 16 degrees Celsius.

The Vales are also responsible for the first autonomously powered settlement in Britain, known as the Hockerton Housing Project, which uses only renewable energy sources.

The New Autonomous House by Brenda and Robert Vale, is published by Thames & Hudson, \$62.54.