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HERE COME THE SOLAR ‘BURBS

Australian scientists are pioneering a world advance in city planning – entire suburbs that save energy and slash thousands of tonnes of greenhouse emissions through better layout.

Passive solar homes are all the rage among new home owners anxious to save money and live more sustainably – but their best intentions can be defeated by poor suburb design, says *CRC Construction Innovation* researcher Michael Ambrose.

“New building regulations are driving builders and home buyers towards more energy-efficient homes, but we’ve found that a poorly laid-out urban subdivision can counteract their best intentions, or cost them a lot more to achieve the desired energy efficiency,” Mr Ambrose explains.

“So we decided to see what could be done by better planning the entire subdivision, so its blocks have the best orientation and shape for energy-efficient buildings to be erected on them.”

The results were astonishing: a well-designed suburb can save its residents 20 per cent on their regular power bills and, if they use solar hot water, up to two thirds of their total power bills.

It would also reduce the greenhouse emissions of the typical Australian home by 700 kilos a year and, with solar hot water, by two tonnes a year!

The problem, says Mr Ambrose, is that suburban development is still driven by a desire for maximum ‘yield’ from the land by cramming as many blocks into it as

possible, regardless of the costs that poor layout will then impose on builders and home owners – or the environment.

“There’s good evidence that by doing this, developers get less money for the land, because building costs are higher to achieve the required energy rating,” Mr Ambrose says.

“There’s a strong message from consumers today that they want to live in energy-efficient homes, and both builders and developers are now starting to get it.”

A well laid-out subdivision, where homes face the right way for passive solar heating and cooling, for solar hot water heaters, for natural light and to take advantage of local breezes, can collectively save millions of dollars to its residents in power bills – and thousands of tonnes of greenhouse gas emissions through reduced electricity use.

The concept is being trialled on new urban developments at Brookwater and Kelvin Grove, Brisbane, Queensland. If all the planned 8000 new homes at Brookwater were in a solar suburb, it would save 16,000 tonnes of greenhouse emissions a year – equal to taking 3000 cars off the roads every year, Mr Ambrose says.

“A typical Queensland subdivision can achieve a 3.5 star energy rating for the average home – but one laid out for energy saving can achieve 4 or 4.5 stars per home, simply through better planning.”

The bugbear is the narrow east-west block: even a well-designed energy-saver home may have trouble meeting its ratings on this, he adds. It will probably need extra insulation and blinds, more cooling and heating and use more power for hot water.

“In Queensland and the warmer States, the single biggest consumer of energy in the dwelling is for hot water heating. The use of solar hot water systems can shift up to 90 per cent of this energy need from fossil fuels to renewable energy. Integrating solar hot water into home design from the outset is one way builders and developers can contribute to huge reductions in energy use.”

According to Mr Dayan Jayasekera, Project Manager of Springfield Land Corporation, “The Brookwater JV is committed to helping builders and purchasers arrive at cost-effective and sustainable solutions to building at Brookwater, while at the same time taking on the stewardship of looking after the environment for generations to come. Our partnership with the *Sustainable Subdivisions Project* will help us meet that commitment.”

Besides solar orientation, the CRC team is exploring the use of suburban layout to take better advantage of cooling breezes in summer. Though there has been a lot of research into wind for power generation, little as yet is known about wind patterns in suburban areas and how they can best be used to reduce use of air conditioning.

Construction Innovation CEO Professor Keith Hampson says sustainability is at the heart of the future of Australia's property and construction sector. "This project was the first in a series exploring a broad range of sustainability issues facing new subdivisions. By working closely with our partners, priorities are determined that enable us to target this research to industry needs. The important practical outcomes generated by the project will be shared with industry through publications and seminars," he says.

A handbook on sustainable subdivision design is due to be released mid-year to industry by *Construction Innovation*.

Prof. Hampson says the research addresses two of the National Research Priorities – a sustainable Australia and frontier technologies to transform industry.

Construction Innovation industry, government and research partners collaborating on the *Sustainable Subdivisions - Energy Efficient Design Project* are: Brookwater JV, DEM, Brisbane City Council, Queensland Department of Public Works, Queensland University of Technology and CSIRO.

The CRC for *Construction Innovation* is a national research, development and implementation centre focussed on the needs of the Australian property, construction and facility management industry. *Construction Innovation* undertakes applied research to produce industry-relevant results for our partners and the whole industry. Website: www.construction-innovation.info

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