

The power of zero

Is Australia waking up to the need for 'zero-energy' and sustainable buildings?

By Cameron Cooper

Buildings are big, bad and ugly when it comes to the environment. The International Energy Agency estimates that buildings use more than 40 per cent of the world's total primary energy consumption and spew out 24 per cent of global carbon dioxide emissions. Such figures leave the usual likely suspects—the transport, aviation and power sectors—in the shade. They also highlight the need for consumers, investors and businesses to understand sustainable living—its benefits, costs and impact on the environment—as a new era of emissions trading regulations loom (see box, The new language of green).

A push for 'zero-energy' buildings in the United Kingdom may be the way of the future. New regulations stipulate that from 2016 all new homes in the UK must be zero-emission

for heating, hot water, cooling, ventilation and lighting. What does that mean? Definitions vary but zero-energy residential or commercial buildings are designed to have a net energy consumption of zero over a typical year. Consider the implications for a home builder, for example. Before construction begins, computer modelling may be used to determine the best orientation for a house to maximise the heating, cooling, lighting and ventilation properties. Energy-saving features would be included, such as extra insulation, double-glazed windows and efficient water-heating equipment. The home should also be able to generate its own energy through means such as solar cells or wind turbines.

There is a distinction between zero energy and sustainable buildings. The former focuses on net operating emissions, or carbon neutrality, while the latter goes a step further, taking into account all site factors such as energy and water use, material specifications and associated transport impacts.

With nations like Germany, Canada, the United States and Malaysia following the UK's lead, zero-energy buildings may indeed be the latest weapon in the fight for a more sustainable building sector. Given that monitoring or measuring energy use in such buildings will be difficult, the key to the initiative's success will chiefly rest on strict government construction standards for new properties that adhere to tougher building codes and ensure best-practice around design, construction and materials. While building costs are expected to be higher—in the order of 2 per cent or more—the long-term payoff is likely to be substantially lower energy bills.

Australia is a laggard to this point, with the Australian Building Codes Board—the body responsible for developing and managing building codes and standards—yet to receive

THE NEW LANGUAGE OF GREEN

Learning the language of the latest green phenomenon—emissions trading—will not only keep you up to date, but may provide business and investment opportunities.

As the Rudd Government debates the launch of its Carbon Pollution Reduction Scheme in 2010, there have been two broad responses—complaints from some big businesses that claim the system will impose cost burdens, and praise from entrepreneurs who see investment opportunities under the new regime.

What does emissions trading mean? It is a market-based tool that, in effect, puts a price on pollution and is designed to limit the output of greenhouse gases. Under an emissions trading scheme, businesses that emit greenhouse gases receive an allocation of permits to emit, which are capped, every year (these permits are called Australian Emission Units). If they exceed the cap, they have to buy additional permits. If, on the other hand, they reduce emissions so significantly that they still have permits left over, they can sell or trade those permits to others, thereby earning additional income.

Some common terms will keep popping up. Aside from carbon credits, the expression cap-and-trade will become ubiquitous. It refers to the most popular type of emissions trading scheme involving the trading of emission allowances within a strict limit. Australia will adopt this scheme, rather than adopt a flat carbon tax on emissions.

Smart businesses will no doubt benefit under the regime. The Garnaut Review suggests the emissions trading scheme could generate more than \$115 billion in revenue from selling carbon pollution permits from 2010 to 2020. Experts believe three main investment opportunities will emerge under an emissions trading scheme: energy-efficient products, clean technology initiatives and renewable energy systems.

guidance from the Federal Government on national initiatives. Some buildings, however, are setting high standards for sustainability, such as 39 Hunter Street, Sydney, and The Gauge in Bourke Street, Melbourne. They are among those gaining premium six-star ratings under the Green Building Council of Australia's Green Star system.

Council Executive Director Robin Mellon says people are starting to see the potential of such environmentally friendly buildings.

"There has been a quantum shift—and it's long overdue," he says.

FOCUS ON ENERGY

But architects, property developers and investors are still concerned about the cost-benefit balance when it comes to zero-energy buildings. In Britain, the government is offering exemptions from property stamp duties for many homes built to zero-energy standards, while other suggested incentives include government rebates for photovoltaic systems or attractive loan terms for people who build such homes.

Some form of government incentives will be required for zero-energy buildings to catch on in Australia, says architect David Kelly, Principal at Bligh Voller Nield.

"In the near future they are not going to be cost-efficient without subsidies," he says. "We're still focused as an industry on reducing the energy used by buildings."

Property developers are cautious of the costs of new regulations, such as zero-energy standards, says Ben Puddy, Urban Design Director at NHAArchitecture. There is a tendency, he argues, for governments to burden property development budgets "with the ills and mismanagement of the previous generations".

All the same, he says, significant progress is being made in Australia towards sustainable design, with projects increasingly balancing environmental, economic and social forces.

COMFORT THE KEY

The benefits of zero-energy or other sustainably designed buildings fall into two main categories: the energy savings delivered and the kudos associated with living or working in a site that helps the planet.

Tone Wheeler, Principal Architect at Environa Studio says that, while the environment is important, client demands for buildings still centre on comfort and lifestyle.

"The moral climate is that we should [be conscious of the environment] but the client says 'why shouldn't I have air-conditioning?'" he says.

Wheeler says US research indicates green buildings with more natural light and



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ventilation and easier access to outdoor areas lead to healthier sites and, in theory, workers who are more productive.

A problem, however, in commercial buildings is "fit-out churn", with office buildings being refurbished on average every eight to 10 years.

"That's the hidden underbelly of sustainability. The waste is extraordinary," Wheeler says.

A GREEN TOUCH

David Kelly says a range of development and design initiatives are contributing to more sustainable buildings. They include:

- smarter orientation of buildings to take advantage of natural ventilation
- superior glazing and insulation systems
- advanced systems to control air-conditioning and lighting.

"They sound prosaic but those simple measures can cut energy use by between 25 per cent and 50 per cent," Kelly says.

He agrees that tenants are eager to tap into the long-term budget benefits of sustainable buildings that deliver cheaper running costs.

"But I think there is a growing sense of their corporate and social responsibility to the planet."

At the Green Building Council, Robin Mellon's concern is that, during an economic downturn, momentum may slow for sustainable buildings and "green may be seen as a luxury".

"People should focus on priorities and make sure that buildings are future-proof," he says.



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