

Building for a sustainable future

By Keith Hampson

The building industry is an important sector of the Australian economy in terms of achieving greenhouse gas emission abatement.

According to a report in the March edition of the Australian Institute of Building's Construct publication, buildings account for 25 per cent of Australia's delivered energy consumption, 30 per cent of greenhouse gas emissions, 30 per cent of acid gas emissions, eight percent of potable water consumption, 17 per cent of NOx emissions and 16 per cent of methane emissions.

Building shell performance has a large impact on the heating, cooling and illumination requirements for commercial buildings. Improvements in the thermal, daylighting and natural ventilation performance of commercial building shells will reduce greenhouse gas emissions.

Increasing the efficiency of artificial lighting will reduce emissions directly by lower energy consumption, and indirectly through lower cooling requirements.

In energy terms, heating is the largest single end use in the commercial buildings sector at 33 per cent, but is the fourth largest with respect to greenhouse gas emissions.

Space cooling, ventilation and lighting were found to be the three most significant causes of emissions, together accounting for 71 per cent of the total.

To assist the industry in reducing emissions, the CRC for Construction Innovation is collaborating with the AGO and the Australian Sustainable Built Environment Council (ASBEC) to deliver industry a web portal that will provide information on building sustainable commercial buildings. The Your Building web portal will operate as an actively updated knowledge bank about the ownership, design, construction, occupation, and operation of sustainable commercial buildings.

The site will consolidate available knowledge on sustainable buildings and provide links to leading organisations and reference material. Through case studies and research findings it will demonstrate the economic, environmental and social benefits of creating sustainable buildings, and it will provide up-to-date information on ratings systems and performance measurement.

It is important for Your Building to demonstrate the economic benefits of sustainability to industry. Undoubtedly, the most effective system to reduce

emissions is one primarily based on a market solution.

Market structures have over the course of many years embedded production and consumption signals and behaviours that underpin our current high emissions economy. Market structures are the only effective way of unwinding these behaviours and patterns and making a sustainable transition to a low emission economy.

However, supporting policies and initiatives will be required to ensure the research and development necessary to identify technology solutions, which is where projects such as Your Building and other work in Construction Innovation's Sustainable Built Assets research program can act as drivers for change.

Australia has the potential to lead the world in 'green building'. Construction Innovation's '2020 Vision' report identified the creation of buildings and infrastructure that minimise their impact on the natural environment as one of the building and construction industry's greatest business opportunities.

One outcome of our research in this area has been the development of a Life Cycle Analysis of Design (LCADesign) software, or the "green calculator". This tool is designed to provide an immediate cost and environmental 'footprint' assessment of commercial buildings.

Construction Innovation has also undertaken sustainability research in the residential sector, with our sustainable subdivision research project.

Our research showed that 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 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.

This 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.

There are many opportunities for industry to achieve profitability through sustainability – and we aim through our research program to assist industry in maximising these opportunities. ■