

Abstract

- The building sector accounts for 23% of Australia's Greenhouse Gas Emissions.
- Lifecycle Analysis considers all phases of a building from the mining of the raw materials to the actual output of emissions.
- LCADesign can do the same analysis in 2 hours that took 7 people 18 months to complete during the construction of the Sydney Olympic Games in 1999 and 2000.
- Building industry faces tall order in cutting emissions.
- Australia may become a world leader in new technology to help our resource hungry sector shrink its carbon footprint

Concern about global warming is increasing and the cost of doing business is rising - so it's no surprise that research and development in the sustainable building sector is thriving.

There is certainly plenty of room to reduce the carbon footprint and water consumption of buildings as they contribute significantly a variety of the world's environmental problems

According to the green building council of Australia, buildings consume 32% of the world's resources including 12% of drinkable water and 54% of Australia's total energy output.

Organisations such as GBCA the CRCCI and the Australian Sustainable Built Environment Council and Autodesk are all in the business of addressing these issues via R&D.

The flagship project for CRCCI is rapid eco-profiling LCADesign. The technology delivers environment impact assessments or eco-profiles of new and refurbished building designs directly from 3D CAD drawings.

In building and construction there is a need to calculate and assess environment harm prior to any new work says Development Manager Murray Jones.

Lifecycle Analysis is a technique that considers all phases of building from the mining of the raw materials to the actual output of emissions. Assessment measures include international standards of resource depletion, air and water pollution, solid waste economic and human impact.

The design for Stadium Australia which is seen as a benchmark for eco-profiling, has catapulted Australia onto the world stage in terms

of Lifecycle Analysis research. It took seven people 18 months to design the "green games" for the 2000 Sydney Olympics. Today LCADesign could do the same job in as little as 2 hours.

Six years in the making, LCADesign is in the final stage of testing and due to be launched in July.

The building industry took to the internet last year, launching the web portal "Your Building". A joint initiative of the Australian Greenhouse Office, the CRCCI, and ASBEC, it is a social networking site much like Wikipedia, using internet links to pool thousands of individual sources of information on sustainability practices, regulation, technological innovations and case studies in a single location. In less than six months the site has amassed 420 registered users, 10 sponsors and 1500 pages of content and received nearly 90000 hits from 40 different countries.

Peter Scuderi, COO at CRCCI explains that sustainable building is now a major player in "big end" construction and town planning; so much so that it has become an automatic prerequisite in the design process.

The biggest challenge is the renovation of existing buildings known as re-lifeing. Re-lifeing of buildings costs can be steep as all mechanical and electrical services - as well as possible leakages of energy through air conditioning heating or plumbing have to be taken into account.

"Your building" has data available on the entire lifecycle of a building from conception through to design construction and reuse.

So what actually constitutes a sustainable commercial building? While there are many views on what characteristics a building needs to possess to be classes as sustainable, 1 Bligh Street in Sydney is set to create a new benchmark in Australia for high rise construction. Called Space the sustainable office tower was designed by the Sydney firm Architectus in association with Ingenhoven Architects in Germany and is due for completion in early 2011.

The building will be 28 storeys high have 42000 square metres of floor space and feature a fully shaded double-skin facade. The design adopts an innovative energy system that uses gas and solar energy simultaneously to generate heating, cooling and electricity. The elliptical shape is 12% more efficient than its rectangular counterparts and allows optimum natural light penetration.

Space has had the most extensive (environmentally sustainable design) analysis of any of our projects to date, says Rodd Perey, design technology director at Architectus. The proposed strategies have scored Space a five-star Australian Building Greenhouse Rating.

A recent study by the ASBEC found that the building sector is responsible for 23% of Australia's greenhouse gas emissions. It estimates that by using today's technology and with neutral cost. The build sector can reduce its greenhouse gas emissions by 30-35% through energy efficiency alone. The monetary saving of such a move could cut the costs of greenhouse gas abatement across the whole economy by \$30 tonne or nearly 14% by 2050 and boost GDP by about \$38 billion a year.

One can only wonder what further innovation might do.