

Eco-profiling with LCADetail

With increasingly stringent sustainable building codes and growing demands for eco-efficiency assessment, members of the building industry need objective green information more than ever.

Filling that brief are two tools that use an information and communication technologies (ICTs) platform to assess the environmental impacts of commercial buildings and building products. The Cooperative Research Centre (CRC) for Construction Innovation is readying LCADesign and LCADetail for market entry as part of a larger lifecycle assessment toolkit that will define project outcomes, design for them, detail supply chain information for procurement and deliver construction best practice and deconstruction including product recovery.

"Both tools are based on software using the latest global industry foundation class (IFC) data transfer protocols for drafting intelligent three-dimensional (3D) computer models," says Dr Keith Hampson, CRC for Construction Innovation Chief Executive Officer.

The tools take off in real-time, transferring data via the IFC protocols straight from 3D CAD modelling to a lifecycle inventory of building products and materials. LCADesign links the inventory to dimensions and quantities via a building product calculator to provide an eco-profile comparing environmental impacts across the whole building supply chain from infrastructure (e.g. transport, forestry, power, water), through bulk (e.g. concrete, clay, structural steel), shapes (e.g. cables, fittings) to items (e.g. fibres and fabrics, paints, sealants). Environmental impacts include resource depletion, water and air pollution, solid waste and economic and human impacts.

In this way, LCADesign will help designers, specifiers, purchasers and manufacturers reduce the environmental impact of commercial buildings. LCADetail, meanwhile, is a spin off from LCADesign software and will eco-profile products such as carpet.

"The software is fast and saves time in eco-profiling," says Del Jones of the Queensland Department of Public Works (QDPW), and one of the key researchers alongside the CSIRO who have worked on developing the Life Cycle Indices database that is at the back end of LCADesign and LCADetail. "Data already in the tools allows for rapid objective analysis and avoids error from manual data entry."

Both tools use an inventory database originally compiled for hosting the Sydney Olympic Games, which maps supply chains throughout Australia for domestic and imported products. It includes Australian and international data, the former developed to represent typical industry practice, with environmental performance evaluated by a company's geographical coverage, technology, fuel source and fleet type and by license conditions. Building product information is from public, commercial-in-confidence, industry and professional sources, and personal experience.

Looking ahead, building product manufacturers with their own LCADetail extranet will be able to submit data directly to the national database for accreditation and automatic creation of their own eco-profiles, Hampson says. "Also, a builder who runs short of materials on a job may check options that meet the contract by logging onto the project-building model through their palm pilot. They then select and log the best option and access the supplier chain LCA Detail extranet to order more stock."

Project partners covering government, industry and research reflect the CRC for Construction Innovation's focus on applied research. They are: Arup, Bovis Lend Lease, Woods Bagot, the Australian Building Codes Board, Building Commission, QDPW, CSIRO, QUT, RMIT and the University of Western Sydney.

LCADesign is being trialled across Australia with industry partners. Caroline Noller, formerly with Bovis Lend Lease and now sustainability catalyst with the GPT Group says, "3D CAD is expanding rapidly as a design platform due to its productivity benefits and client-focused friendly outputs. LCADesign is a powerful tool with the potential to transform the environmental assessment market."

The CRC for Construction Innovation is a national research, development and implementation centre focussed on the needs of the Australian design, 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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