CRC FOR CONSTRUCTION INNOVATION

Chief executive officer of the CRC for Construction Innovation, Keith Hampson, took some time from his hectic schedule to discuss the organisation's history, objectives and plans for the future.

The Cooperative Research Centre (CRC) for Construction Innovation is a national research, development and implementation centre focused on the needs of the property, design, construction and facility management sectors. Established in 2001 and headquartered at Queensland University of Technology as an unincorporated joint venture under the Australian government's Cooperative Research Program, Construction Innovation is developing key technologies, tools and management systems to improve the effectiveness of the construction industry.

Underpinning Construction Innovation is a most significant commitment to advance to construction research in Australia – a seven-year $14M commonwealth grant and $50M in industry, research and other government funding. More than 300 researchers and an impressive alliance of 20 leading partner organisations are involved in and support the activities of Construction Innovation.

CRC RESEARCH PROGRAM ON SUSTAINABLE BUILT ASSETS

CRC for Construction Innovation has Sustainable Built Assets as one of its three Research Programs (see Figure 1 below).

The objective of the Sustainable Built Assets Program is:

1. to enhance the sustainability of built assets via their eco-efficiency of design and operation through:

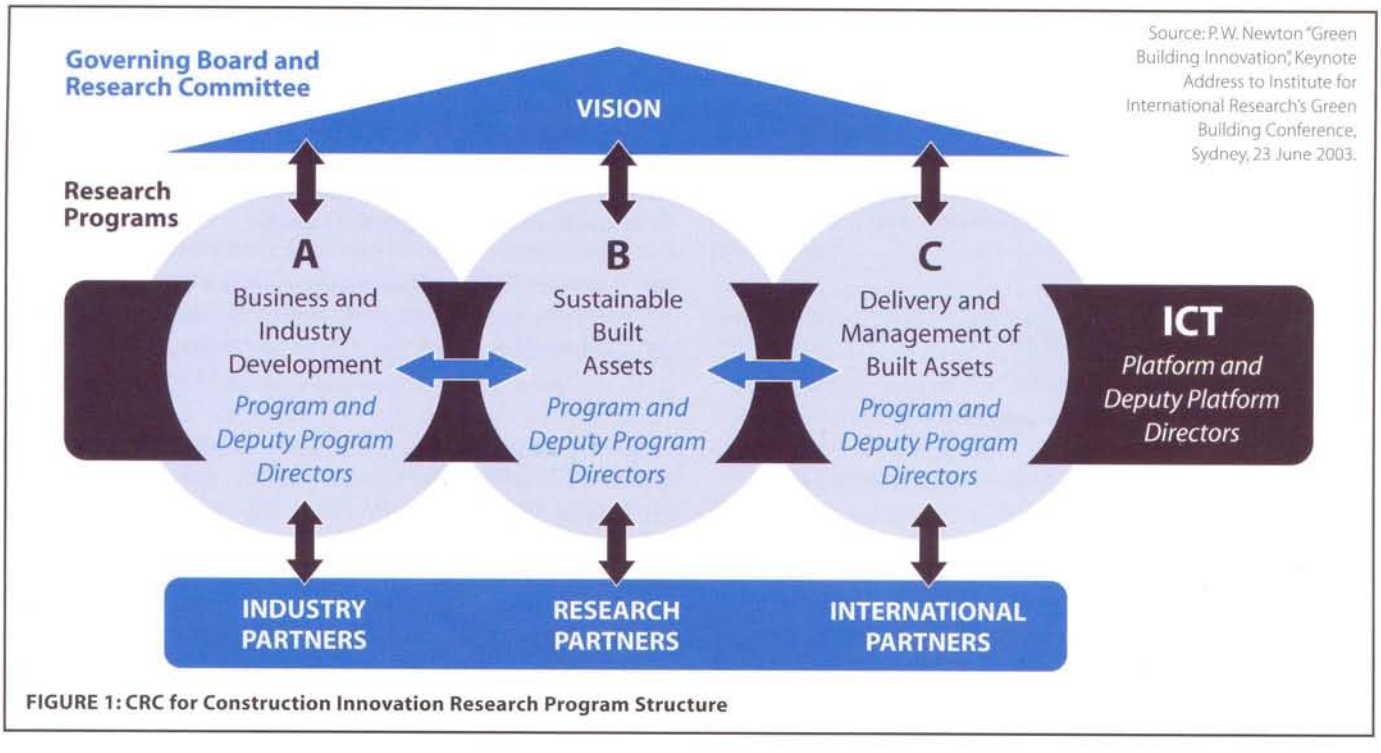
- sound conceptual basis for economic, social and environmental representation and accounting of the built environment - virtual building technology capable of examining design performance prior to construction and use, and

2. to increase the human health and productivity benefit via the creation of smart, high quality indoor environments.

Eco-efficiencies are one of the three critical tradeoffs that need to be made in relation to delivering a more (versus less) sustainable building. This is illustrated in Figure 2 below:.

Building eco-efficiency represents the delivery of joint benefits to environment and economy through a specific built asset such as commercial building; worker productivity in the building context is the joint outcome of an optimal mix of economic and social (organisational) factors; while human health and well being as mediated through buildings – where Australians spend over 90% of their time – requires delivery of high quality physical and social environments.

Construction Innovation aims to deliver on its two principal objectives via a program of research involving its industry,



Source: P.W. Newton "Green Building Innovation," Keynote Address to Institute for International Research's Green Building Conference, Sydney, 23 June 2003.

FIGURE 1: CRC for Construction Innovation Research Program Structure

government and research partners (refer www.construction-innovation.info for more details on the CRC) which focuses on 5 strategic areas:

1. SUSTAINABILITY FRAMEWORKS:

Advancing projects in this cluster are those which advance our understanding of sustainability in the context of built environments from theoretical and applied perspectives.

A major report has been produced on Sustainability and the Future Building Code of Australia, the contents of which will be examined by the Australian Building Codes Board (November 2003) in deliberating on the extension of BCA to include a Sustainability Theme.

2. VIRTUAL REPRESENTATION OF BUILT ASSETS

Projects in this cluster are those which enable a virtual representation of whole buildings or parts of structures prior to their construction, including an ability to facilitate assessments of their Triple Bottom Line performance against established benchmarks. The ICT toolkit for Architecture Engineering and Construction (AEC) applications include: inter-operability, visualisation, automation, collaboration and integration, and real time design experimentation.

3. SUSTAINABLE COMMERCIAL BUILDINGS

Projects in this cluster will deliver next generation methods and tools for sustainable design, monitoring and management of commercial buildings. Focus will be on whole-of-life eco-efficiency assessment, enabling a significant contribution to reducing resource use (especially water and non-renewable energy), minimising damaging environmental emissions (greenhouse gases, air pollution, liquid and solid waste flows, noise) and improving indoor air quality.

One of the key projects in this cluster involves development of LCADesign, an eco-efficiency assessment tool for commercial buildings capable of providing an automated environmental assessment of a building direct from a 3D CAD model. For the designer, this will be equivalent to the use of Spell Checker in MS Word by the writer.

LCADesign also has the capacity for extension as an eco-efficiency assessment tool for housing and urban infrastructure (e.g. road, rail, water, energy, etc.). It will have the capacity to perform the role of an assessment tool against future environmental sustainability performance measures that may appear in a future Building Codes of Australia or state government building performance guidelines or industry guidelines

LCADesign also has an extensive LCA database of building materials that could support a future eco-labelling product scheme.

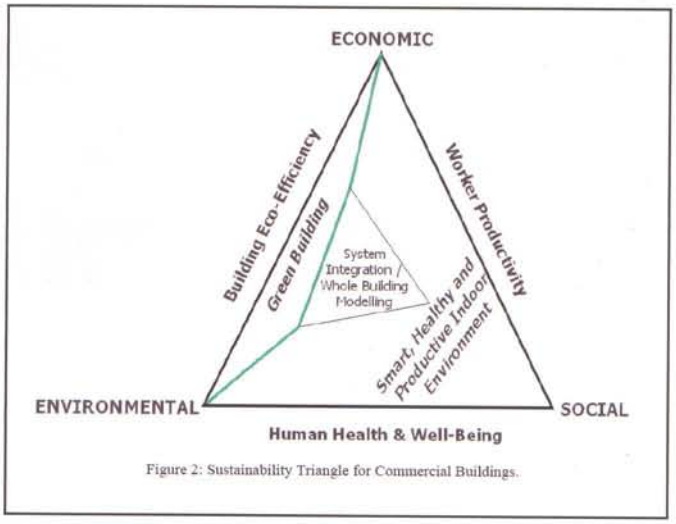


Figure 2: Sustainability Triangle for Commercial Buildings.

4. INDOOR ENVIRONMENTS: DESIGN, HEALTH AND PRODUCTIVITY.

Projects in this cluster will deliver new knowledge in relation to:

- Indoor ecology and design of high performing physical indoor environments: understanding and modelling the complex inter-relationships of facades, lighting, thermal performance, acoustics, ventilation and air quality.
- Indoor environments, epidemiology and productivity: quantifying the linkages between indoor environment, health and productivity.
- Intelligent rooms: smart spaces that incorporate sensor technologies for a wide spectrum of operations, ranging from management of indoor environment to human-computer interfacing and distributed collaborative working.
- Nano-rooms: that incorporate new, high performing surfaces and material components.
- Modular construction: as a basis for delivering new building services as well as new building products.

5. SUSTAINABLE SUBDIVISIONS

Projects in this cluster will deliver a step change in sustainable performance of subdivisions via parallel and interfaced innovation at both the dwelling scale and the neighbourhood infrastructure scale

The first project underway in this cluster – Sustainable Subdivisions: Energy Efficient Design is applying CSIRO's AccuRATE (NATHERS 2003 version) towards establishing new design principles for medium density and high rise housing – an area where there is a dearth of guidelines and best practice case studies. **FM**

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