TOOLS FOR A SUSTAINABLE BUILT ENVIRONMENT

The push for sustainability crosses all sectors of society, with the construction industry having an important role. One initiative assisting in shaping sustainable built environments is building rating tools.

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Al Gore's movie, 'The inconvenient truth,' the International Panel for Climate Change report, and politicians the world over are all contributing to our growing awareness of environmental issues. All parties are advocating decisive action to make societies more sustainable. For the building industry, this means developing a sustainable built environment, a term that has become commonplace within the last couple of years.

Buildings are an obvious place to focus attention when addressing environmental issues; according to the OECD they are responsible for consuming 32% of the world's resources, including 12% of its water and up to 40% of its energy. Buildings also produce 40% of waste going to landfills and 40% of air emissions.

There is a wealth of international activity trying to reduce the environmental impacts of the built environment. This includes development of lobbying groups and organisations, competitions, rating tools, policy and strategy, regulation and self-regulation (see Table 1).

Building rating tools

Building rating tools are playing an ever more important role in shaping sustainable built environments. These are used to provide a measure of a building's environmental performance. Although they do not actually address social, economic or environmental impacts, they help express these to the public, who in turn have the collective power to change the market through demand.

National Green Building councils administer building rating tools relevant for their nations. The US Green Building Council administers a tool called LEED (Leadership in Energy and Environmental Design Green Building Rating System™). This is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings in America. LEED aims to give building owners and operators the tools they need to have an immediate and measurable impact on their building's performance. It promotes a whole-building approach to sustainability by recognising performance in five key areas of human and environmental health – sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Just as the US Green Building Council administers LEED, the Australian Green Building Council and the New Zealand Green Building Council administer their own nationally relevant building rating tool called GreenStar.

We can make a difference

We all have four key ways to make change. We can choose:

- which products and services we buy
- where we invest
- where we want to exchange our labour
- who we vote for.

Building rating tools can help us make informed choices. For example, we can promote change through choosing sustainable buildings, including housing and offices with a low environmental impact, or hotels with services that have a good environmental performance. We can also make investment choices based on the environmental performance of a company. We can choose where we want to work, and building rating tools provide us with an indicator of good locations to spend our working hours by including social ratings in the tools. Lastly, we can vote for a government that promotes sustainable buildings and communicates that through demonstrating leadership in the buildings that they choose to occupy.

ENVEST 2 useful early design tool

When designing an environmentally friendly building, the environment needs to be considered from the outset. One way of doing this is to use ENVEST 2. It is an online design tool hosted by the United Kingdom's Building Research Establishment. It is designed to simplify the complex process of designing buildings with low environmental impact and whole-life costs. It allows both environmental and financial tradeoffs to be made explicit in the design process, allowing the client to optimise the concept of best value according to their own priorities.

Designers can use ENVEST 2 to test the environmental performance of the design by inputting their building designs (including height, number of storeys, or window area) and choices of elements (such as external wall or roof coverings). The program identifies elements with the most influence on the building's environmental impact and whole-life cost and shows the effects of selecting different materials. It also predicts the basic environmental and cost impact of various strategies for heating, cooling and operating a building.

Having made comparisons between different buildings and specifications, designers can graphically demonstrate the environmental and financial credentials of different designs to clients. ENVEST 2 produces detailed and summary information that is readily transferred to the user's own template to create an environmental report for a building, thus simplifying the environmental design process.

Although very basic in its current form, ENVEST 2 paints a picture of future environmental design tools. The concept is exactly what is required, however it requires investment and further development to make it a fast and practical tool for the realities of modern design processes.

BRANZ intends to develop the concept further and deliver a faster and more practical version for the Australasian marketplace.

There are also design tools available for later stages which use Life Cycle Assessment and 3D CAD to give immediate ratings of a building's impacts. Although in the early stages, such tools are developing fast for a hungry design profession.

Time for change is now

There is really no choice. We must either build sustainable cities or continue to live in a way that erodes the ecological foundations that support our societies. Humans have a propensity to always wait until the last safe moment before responding. In ecological terms, we are at that moment and we are responding by developing sustainable built environments. The regulation is here, the information is available to give environmental ratings, the tools are developing to design appropriate buildings, so we must make our choices and drive change.

CHALLENGE THE FIRST 30 MINUTES

The biggest decisions in design are often in the first 30 minutes of the very first design meeting. Picture the scene – the client, architect and other professionals considering the building brief. Then BANG, a flurry of micro-pen activity on some butcher's paper, some obliging arrows and before you know it you have the beautiful outline of a building, car parks and roads, positioned on the site, with lovely mature trees.

'That's it' says the client, 'Can it be done within the budget?' This stimulates the engineer and the quantity surveyor. The building is developing at a lightning pace along a trajectory from which it is difficult to return. Everyone is doing their job, and the client is happy! Or are they? The environmental advisor is left to rate the building, and suggest amendments later in the design process.

Maybe the outcome would have been very different if the environment impacts were considered upfront with the use of an early design tool.

Table 1: Some initiatives to develop sustainable built environments.

Sustainable building initiatives	Description
International	
World Green Building Council	Aims to be the peak global not-for-profit organisation working to transform the property industry towards sustainability through its members – national Green Building Councils.
International Initiative for Sustainable Built Environment (iiSBE)	iiSBE run the Sustainable Building Challenge or SBC (known previously as Green Building Challenge). It is an international collaborative effort to develop a building environmental assessment tool that addresses a broad range of sustainable building performance issues from which the participating countries can selectively draw ideas to develop new tools or to modify their own existing tools.
America	
US Green Building Council	Developed the LEED series of building rating tools, the most established and developed suite of building rating tools.
Asia	
Sustainable Cities Construction, China	China plans to build housing for as many as 400 million of its citizens by 2017 in Sustainable Cities. The design and construction of the first of these cities, Dongtan, is underway. It is predicted that 40% of all construction over the next 20 years will be in China and 30% in India.
India Green Building Council	Started in 2001 under the auspices of the Confederation of Indian Industry. Has strong market and political influence right up to the Indian President.
Europe	
European Network of Building Research Institutions (ENBRI)	ENBRI was founded in 1988. It includes the principal building research institutes of member states of the European Union. It collaborates to provide knowledge to form a Sustainable European Built Environment. The UK Building Research Establishment is a key contributor and runs the building rating tool BREEAM. Most European countries have, or are developing, environmental rating systems for buildings.
Australia and New Zealand	
Sustainable Cities Report, August 2005	Report released by the Australian Government outlining a roadmap of how to develop sustainable Australian cities.
Green Building Council's GreenStar tools	The Australian Green Building Council has developed a suite of tools to rate buildings. They are collaborating with the newly formed New Zealand Green Building Council in the development of a New Zealand tool.
Building Sustainability Index legislation (BASIX)	NSW State Government legislation, making reductions in energy and water consumption law.
Level	BRANZ website launched in 2007 which provides practical technical options for building professionals.