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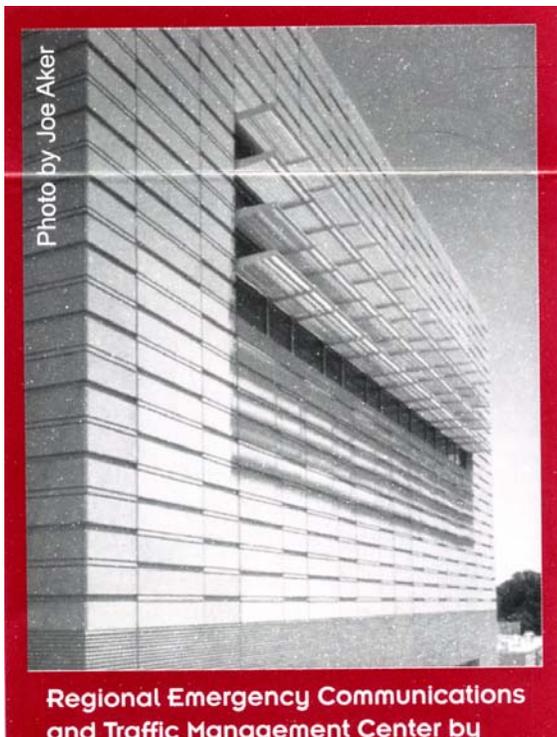
## **Rating Sustainability - How Green is your building**

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Oil prices topping USD 60 per barrel amid supply uncertainty and increasing demand tends to raise public awareness of energy conservation issues. Will the widespread economic pain of higher energy prices produce real long-term changes?

Rising energy prices propelled the energy conservation movement of the 1970s. Building energy efficiency increased during the last quarter of the twentieth century. However, who was more motivated to act; governments or consumers? Most observers would probably agree that government policies, regulations and incentives produced the greatest change.

Energy conservation is only one aspect of the bigger picture— sustainability or green building. Green building is a broad term integrating many interests and viewpoints. Its essence is reducing environmental impacts through a holistic approach to land use, building design and construction strategies. However, the economic affects of the broader environmental issues are not as directly noticeable to the building consumer as energy use.



### **Growing Green**

The green building movement is gaining momentum around the world. Some dare say it is moving to mainstream practice. This may be an overstatement, but there is little doubt of growing awareness among design professionals and building owners.

Some government policies and building regulations support aspects of the broader sustainability goals. However, the combined efforts of individuals in the property industry to move it towards sustainability are having remarkable effect. The World Green Building Council (WGBC) and the national Green Building Councils are examples.

Organizations promoting sustainability realized that an environmental assessment system is a powerful tool to help reach sustainability goals. Assessment systems

provide a common set of criteria and targets and a verifiable method for assessing performance. They are an educational tool as the rating systems help raise public and professional awareness of environmental issues.

Assessment systems answer the essential question, "How do we know if our building is green?" A rating system provides a measure of 'greenness'. Also, do not underestimate the importance of an industry accepted stamp of approval.

Worldwide, there are many approaches to rating a building for its environmental impacts. (See sidebar) The WGBC holds the position that one tool does not fit all. Each country's assessment tool "meets the local market needs and is benchmarked against local practices and legislative precedents," according to Maria Atkinson, Executive Director of the Green Building Council of Australia.

"There is an emerging awareness that green buildings also create healthier work, learning, and living environments. This awareness of indoor environmental quality is lower than the understanding of energy or water efficiency," says Atkinson. The increased awareness of sustainable building as more than just meeting code requirements focusing on energy efficiency excites those involved in the green building movement.

## Championing Green

## Rating Tools

As with any change, green building requires something to give it momentum and a champion.

"The Sydney Olympics provided an impetus for Australia to develop Green Building capability," notes Atkinson. "To sustain the achievements of the Olympics and provide further development, the industry urgently needed an agreed framework and methodology for building and measuring 'green'." Their response was founding the Green Building Council of Australia and developing its Green Star rating scheme.

S Srinivas, Senior Counsellor at the CII-Godrej Green Business Centre believes momentum began building in India when the USGBC awarded LEED Platinum rating to the CII-Godrej building in 2003. Since then, more than 30 buildings are pursuing or have received LEED rating. Interest is growing,

Organizations producing environmental assessment tools have similar overall concerns. However, different systems may well produce different results. A synopsis of a four rating systems is below.

**BREEAM** (Building Research Establishment Environmental Assessment Method), UK Building Research Establishment (BRE). BRE developed the first tool for new offices in 1990. BREEAM tools are used or adapted by other countries. Assessment tools include offices, homes, industrial, retail and schools. BREEAM uses nine categories to assess building performance; management, energy use, health and well-being, pollution, transport, land use, ecology, materials, water. The tools award points for performance against criteria that are added together for an overall score to assign one of five possible ratings. BREEAM provides assessment opportunities for pre-design, design completion and occupied buildings.

**LEED** (Leadership in Energy and Environmental Design), US Green Building Council (USGBC). The LEED assessment tools are voluntary, consensus-based national standards. The first assessment tool, covering New Construction, was developed in 2000. Current assessment tools include new commercial construction and major renovation, existing building operations,

but general awareness of green building is scarce. To further advance sustainable design in India, Srinivas believes they must "involve a critical mass of stakeholders" and "launch LEED India."

LEED—a voluntary method in the USA—relies on passionate, committed people to educate owners on the merits of green building. Through their efforts, some State and local governments have adopted LEED as a green building guideline for their building projects.

Bharat Patel, principal with DMJM, says early success for green was from "institutions and governments mandating LEED certified buildings." In 2001, the Los Angeles Community College District became an early pioneer requiring the 44 new buildings on the USD 2.23 billion bond program be LEED certified. After this, the City of Los Angeles adopted LEED. Then, the University of California adopted it, as did the State for all its buildings.

The government sector is leading the way in adopting green design for its projects. Government projects account for nearly 45 percent of all USGBC LEED registered projects. Government agencies may use the LEED guidelines, but they often choose not to pursue registration for certification.

In Australia, government leadership, by embracing the Green Star system, is found at various levels: State governments of Victoria and South Australia, the Department of Defence, city

commercial interiors and core and shell. The USGBC is developing tools for homes and neighborhood development. LEED uses six categories: sustainable sites, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, innovation. Each category has specific design goals worth points—some are mandatory. Point totals earn projects one of four ratings.

**Green Star** (Green Building Council of Australia), Launched in 2003, Green Star drew from existing rating systems including BREEAM and LEED, but it is tailored to the Australian marketplace and environmental context. Green Star includes tools for office design, office as-built and office interiors. An office asset tool is in pilot study. Planned tools include retail, health, residential and education. The tool uses ten categories:

energy, management, water, indoor environmental quality transport, ecology and land use, emissions, materials, innovation. Ratings (stars) have six levels, but only four are eligible for certification. Green Star uses category weighting factors that vary across states/territories to allow for differing environmental concerns and imperatives.

**CASBEE** (Comprehensive Assessment System for Building Environmental Efficiency), Japan Sustainable Building Consortium (JSBC). JSBC introduced a new buildings tool in 2002 and an existing buildings tool in 2004. Other tools include temporary construction and heat island. A renovation tool will be completed this year. JSBC plans tools for district, region, detached house and pre-design assessment. CASBEE uses four primary categories: energy efficiency, resource efficiency local environment, indoor environment. It considers building environmental quality and performance—a positive impact—and building loadings—a negative impact. CASBEE ranks efficiencies in five categories.

The industry is embracing rating tools. Most rating systems are very young and evolving. Each system strives to be responsive to its national concerns, regulations and conditions, but they have weaknesses. The limited building types covered are a common complaint that organizations are addressing. There is also a tension between ease of use and thoroughness. For example, lack of life cycle assessment in LEED troubles critics. Yet, this would make LCCD more difficult to use and perhaps

governments of Melbourne and Brisbane and the Sydney Olympic Park. In April, the GBC of Australia gave Melbourne's Council House 2 its first 6-star award —the highest Green Star rating.

Many new UK government office buildings are being required to achieve BREEAM Excellent. The Department of Education and Skills requires new schools achieve Very Good as a minimum.

not readily accepted.

Another concern is that the process can lead to a checklist mentality Rather than encouraging out of the box thinking, the rating system may actually limit the scope of consideration. The checkbox approach leads to an all or nothing score on each parameter. This leads to "arcane and sometimes arbitrary rules about their award," notes Ian Butters of Faithful & Gould. "Tick-box schemes are also difficult to use as graduated incentives for improvement."

## Designing Green

Green building requires a holistic design approach. Integrated design, views the entire building as a system and recognizes that design choices in one area often affect other building systems. By using system interactions, designers can maximize the overall building performance. Some green design features, like exposed thermal mass, require the highly collaborative, multidiscipline approach.

Atkinson notes that "pursuit of energy efficiency in isolation of other environmental impacts can create sick buildings for occupants."

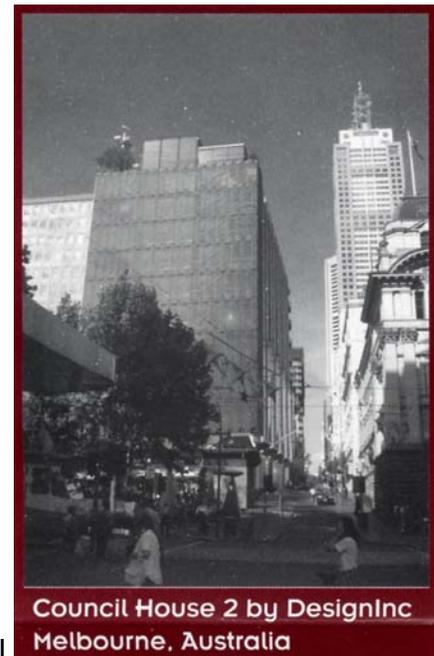
This change from the more traditional design approach is not a new idea. It is critical to successful green design and requires a significant process change. Patel thinks it is not a question of will green design change the design and construction process, but "how fast will the change occur."

Designing green requires a green products and materials supply chain. In Australia, procuring them is "one of the greatest challenges facing green designers," notes Atkinson. Unlike North America, Australia has a relatively small manufacturing sector. The USGBC achievements "influencing the supply and manufacturing chain are difficult to replicate in Australia." This is one of the differences national rating systems must recognize.

However, Atkinson sees the GBC of India working with its manufacturing sector as "an exciting model for the Asia Pacific Region. India may produce green technologies, products and materials at competitive market rates for countries like Australia to import."

Governments, while promoting green design, can stifle it through codes and requirements. An often cited problem is obtaining approval to use waterless urinals. Another common problem is approval for greywater recycling.

The Los Angeles Department of Water and Power has contradictory policies, notes Patel. They promote green power generation, while discouraging all forms of green power generated on



Council House 2 by DesignInc  
Melbourne, Australia

site by charging higher rates should a project use forms of on-site generation. The higher rates effectively make it uneconomical to employ the technologies.

## Costing Green

When not mandated or incentivized by government, persuading the property industry that green is cost beneficial remains a challenge. The short-term focus of most property owners is a real barrier. The capital and operating expenditure funding disconnect also creates difficulties. When funding does not consider whole life costs, demonstrable tangible benefits—such as reduced operating costs—requiring additional capital are seldom funded. Intangible benefits are rarely part of any value consideration.

The debate about the capital costs of green design continues. However, the real discussion should be about whole life costs.

"Sometimes, there is the perception that green buildings cost substantially more. However, this would be contrary to the root of sustainability. A fundamental premise of green buildings is to use fewer natural resources," says Patel.

It is possible to achieve many LEED points at no or very low initial cost, but some points add initial cost. As a generalization, there may be a 2 to 3 percent premium associated with the LEED Silver certification standard. Butters notes this is the similar expected increase "for the achievement of BREEAM Excellent in the UK, site issues permitting."

<b>Per Capita Comparative Statistics</b>						
Total Construction Spending Rank/ Country	Population Rank	Construction Spending	Primary Energy Consumption	CO2 Emissions	Gross Domestic Product	
		USD	tonnes of oil equivalent	tonnes		USD
1 USA	3	4,091.85	7.88	20.16		40,100
2 Japan	10	4,267.87	4.04	9.44		29,400
3 China	1	229.35	1.06	2.72		5,600
4 Germany	14	3,132.30	4.01	9.75		28,700
5 France	21	3,432.46	4.33	6.16		28,700
6 Italy	23	3,328.57	3.16	7.48		27,700
7 UK	22	3,034.34	3.75	9.20		29,600
8 Spain	29	4,429.69	3.61	7.32		23,300
9 Canada	35	4,029.87	9.37	16.52		31,500
10 Netherlands	59	5,034.29	5.81	9.39		29,500
11 India	2	72.67	0.35	1.16		3,100
12 Mexico	11	650.64	1.37	3.73		9,600
13 Brazil	5	304.65	1.01	1.75		8,100
14 Australia	52	2,553.45	5.92	18.26		30,700
15 Russia	8	327.71	4.66	9.86		9,800

Sources: Global Insight Inc., CIA World Factbook 2005, BP Statistical Review of World Energy June 2005, UN Common Database