



THE DOLLARS AND SENSE OF GREEN BUILDINGS

2008

EDITION

Building the business
case for green buildings
in Australia

PREVIEW EDITION

This is a preview version only and
does not include all chapters listed.
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In April 2004, the Green Building Council of Australia (GBCA) received funding from AusIndustry under its Innovation Access Program for a project titled 'Green Star Diffusion'. The AusIndustry project sought to disseminate information to promote the uptake of green building practices by the Australian property industry. As part of this project the GBCA undertook to examine the business case for green commercial buildings in Australia by reviewing the latest international information and local case studies.

In late 2005, the Victorian Building Commission and Sustainability Victoria provided additional funding to the GBCA to update the AusIndustry Report to identify actions for industry and government that could be used as a basis for the development of a national roadmap for future sustainable building in Australia. The report was released in 2006 and was titled "The Dollars and Sense of Green Buildings: Building the Business Case for Green Commercial Buildings in Australia".

In 2008, the Green Building Council of Australia reviewed this report in response to the growth and uptake of green building practices in Australia. This review was made possible by sponsorship funding from InterfaceFLOR.

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A green building is one that incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and occupants with strategies for addressing:

- 1. energy efficiency;
 - 2. greenhouse gas emission abatement;
 - 3. water conservation;
 - 4. waste avoidance, reuse and recycling;
 - 5. pollution prevention – noise, water, air, soil and light;
 - 6. enhanced biodiversity;
 - 7. reduced natural resource consumption;
 - 8. productive and healthier environments; and
 - 9. flexible and adaptable spaces.
-



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INTRODUCTION

SECTION | ONE





1.1 PURPOSE

In 2006, the aim of the original Dollars & Sense of Green Buildings report was to examine international case studies and local examples of buildings to demonstrate a strong business case for building green. It was the Green Building Council of Australia's first attempt to provide a basis for a national roadmap for future sustainable building in Australia, and to identify a range of actions that could provide a way forward.

Given the success of the 2006 Report, the 2008 edition of the Dollars and Sense of Green Building report aims outline changes and how the understanding of 'green' has evolved. It also reviews what has been learned from case studies, improvements in the rating tools, industry practices and knowledge as well as the new cost benchmarks, business benefits and economics of green buildings. Having set out the current position this Report examines realistic future goals and targets, continuing barriers, and the actions required to enable the industry to continue to move forward.

Commercial office buildings provide much of the discussion and the best examples of green buildings. But other building types including retail, industrial, educational, healthcare and residential are now being planned and developed as green buildings. While some of these have been used in this report, it is still very early days, so as the best examples of these buildings occur, the Green Building Council of Australia will produce summary information sheets outlining their aims, cost and benefits.

This 2008 Report continues the original goal of providing a basis for a national roadmap for future sustainable building in Australia and recommending actions that are necessary if Australia is to future proof its building assets and maintain its reputation as one of the leading nations in green building.

1.2 REPORT STRUCTURE

This Report has been written with the diversity of the commercial property industry in mind, including leading Australian institutional investors, superannuation funds, valuers, property trusts, financial organisations, private investors, developers, asset managers, builders, design practitioners, manufacturers and suppliers. It is also highly relevant for local, state and federal government agencies as well as for tenants.

-
- 2** **SECTION TWO:** provides an update on how the industry has changed since the 2006 Report was written and summarises the original rationale and approach of the report which essentially haven't changed.
- 3** **SECTION THREE:** specifically addresses the importance of the built environment in our fight against climate change.
- 4** **SECTION FOUR:** provides an update on the Green Building Council of Australia and an overview of future plans.
- 5** **SECTION FIVE AND SIX:** focuses on the benefits and how to overcome the barriers to building green.
- 6**
- 7** **SECTION SEVEN:** provides an overview of what is happening internationally.
- 8** **SECTION EIGHT:** outlines the incentives and leadership currently being offered by local, state and federal governments.
- 9** **SECTION NINE:** addresses the challenge of how to green our existing building stock.
- 10** **SECTION TEN:** Provides advice to owners and tenants on how to enhance their performance in a Green Star rated building, based on research by Mirvac School of Sustainability
- 11** **SECTION ELEVEN:** identifies a range of actions which could provide a way forward for more green building activity in Australia.

BACKGROUND

SECTION | TWO



2. BACKGROUND

Australia's property industry has seen dramatic change since the Green Building Council of Australia (GBCA) published its Dollars and Sense of Green Building report in February 2006. At that time those committed to sustainable design and environmental management, the early adopters, felt some industry resistance. The view was that Australia was at a crossroads. There was great pressure from the knowledgeable and leading developers and occupiers in the industry to 'build green' but there was also widespread scepticism. Negative perceptions were rife; tenants did not care, the cost penalties for green were significant, tenants would not pay the necessary rent, and valuers would not reflect 'green' building specifications in valuations.

By 2008, there has been a fundamental shift in the building industry and a realisation that green buildings make economic sense. 'Green' is no longer considered marginal or niche, in fact non-green buildings now occupy this space. The industry has come to understand the reality of climate change and the need and urgency to create a sustainable future by adopting 'green' principles in all stages of the building life cycle.

Climate change and the need to reduce GHG emissions, in particular CO₂, is probably the most important and urgent issue facing mankind. Because buildings contribute about 40% of total emissions they should be at the frontline of the fight against global warming.

Public awareness of climate change and propensity for action have been bolstered by films, reports and events such as Al Gore's An Inconvenient Truth; reports by Sir Nicholas Stern, the Intergovernmental Panel on Climate Change (IPCC), CSIRO and the Garnaut Climate Change Review; Tim Flannery's The Weather Makers, and the frequent media coverage of extreme weather events and water shortages. At an industry level there have been the Australian Sustainable Built Environment Council, McKinsey and Vattenfall reports.

Australia's ratification of the Kyoto Protocol, which gives a binding commitment to limit GHG emissions to 108% of 1990 levels by 2012, should lead to nationwide co-ordination of strategies and policies which will promote even more rapid change.

The Green Building Council of Australia has been an important leader and advocate for change and the rapid spread in awareness, acceptance and use of the Green Star rating system throughout Australia is a key indicator of the GBCA's success.

The Dollars & Sense 2006 report pointed to some of the main challenges and barriers to the mainstream uptake of green building principles and actions needed to facilitate change. To overcome these barriers the Green Building Council of Australia has energetically promoted the merits and adoption of green building principles throughout the building industry, government, investor, financial, industry and professional organisations, as well as among occupiers and educators. The GBCA's promotion of green building has been multi pronged and has included participation in or running of conferences, seminars and training workshops, commissioning research reports, working with industry organisations and continuing to develop the Green Star suite of rating tools.

It should be apparent from the report that two of the best indicators of change in the green building industry are:

(a) The development market has moved rapidly beyond the early and misplaced focus on cost, to a focus on the benefits of green buildings and the growing demand for them. As a result 62% of developers and owners registered for Green Star are seeking to achieve a 5 or 6 Star rating.

(b) The growth and changing membership structure of the GBCA. Members now come from all sectors and overall growth since the 2006 Report has been 308%.

Climate change and the need to reduce GHG emissions, in particular CO₂, is probably the most important and urgent issue facing mankind. Because buildings contribute about 40% of total emissions they should be at the frontline of the fight against global warming.

OLD BUSHELS WAREHOUSE

Description

The State heritage-listed building at 88 George Street is made up of two interconnected warehouses. Number 88 George Street was built in 1886 and number 86 in 1912, and both have a close association to the mercantile activities of The Rocks and in particular the Bushels Tea Company. Once completed, the project will deliver approximately 2,200 square metres of commercial office and retail space over six levels. In December 2007, 88 George became the first State heritage listed building in Australia to achieve a 5 Star Green Star - Office Design rating.

Business case

SHFA estimates the project to have cost approximately 5% over the premium rate to achieve a 5 Star Green Star rating, which will be paid back through higher rents and full tenancy before the building refurbishment has been fully completed.¹

Green Star initiatives

Management

- Green Star accredited professional.
- Tuning the heating, ventilation and cooling systems to improve their energy performance.
- Developing a building users' guide to give tenants relevant information on how to most effectively use the water, energy, waste, transport and other sustainable components of the building.

Indoor Environment Quality

- The air conditioning system provides ventilation levels that are 50 per cent higher than the Australian standard.

- The thermal mass of the existing sandstone walls and floor help stabilise internal temperatures.
- Maintaining functional windows to allow tenants to turn off the air conditioning and take advantage of ocean air flow and external air conditions.

- Large external windows on most facades allow tenants to enjoy high levels of daylight.
- High quality and efficient lighting to balance tenant comfort and energy use.
- More than 60 per cent of office space has an external view with no point on each floor more than 12 metres from a window.
- Use of insulation and equipment to reduce internal noise levels and improve occupant comfort.
- Low volatile organic compound (VOC) paints, adhesives and sealants and products with low or no formaldehyde have been used in construction to reduce internal air pollutants and eliminate 'sick building' syndrome.
- Polished timber and natural flooring in common areas to promote occupant well being and health.
- Air exhaust risers into every tenancy floor help eliminate indoor air pollutants created by activities like photocopying and printing.

Energy

- Installing an innovative approach to air conditioning using a future district cooling system which will deliver energy savings of up to 40 per cent and prevent approximately 136,000 kilograms of carbon dioxide entering the earth's atmosphere per annum.
- Installing sub-metering on every floor to allow tenants to better manage their own energy use.

- Installing lighting zones of less than 100 square metres on every floor with easily accessible and identified switches to help tenants reduce their energy consumption.

Transport

- Fewer parking spaces have been installed to encourage tenants to travel to and from work by cycling, walking or using public transport located nearby.
- Cycling facilities for up to 12 bicycles, as well as accessible showers, change facilities, secure storage and lockers, have been installed.
- A number of parking spaces are designated for small cars only.

Water

88 George will reduce the amount of potable water usually consumed by a commercial office building of this size and nature by up to 85 per cent by:

- Using the harbour to 'reject' heat from the building's heating, ventilating and air conditioning system (HVAC) to replace cooling towers, saving an estimated 3.8 million litres of water each year.
- Installing high efficiency dual flush toilets and 6 Star tap and sink fittings to allow tenants to minimise water use.
- Water sub-metering to allow tenants to better manage their own water consumption.

Materials

- A dedicated recycling waste storage area has been installed for use by all offices in the building.
- The building's original heritage fixtures, including its façade and structure, were conserved to reduce waste.



Address:	86-88 George Street, The Rocks, Sydney, New South Wales
Owner:	Sydney Harbour Foreshore Authority (SHFA)
Architect:	Terroir
Heritage Architect:	Design 5
Mechanical Engineer:	Steenesen Varming
Electrical Engineer:	Steenesen Varming
Main Contractor:	Hooker Cockram
Structural Engineer:	Simpson Design Associates
Quantity Surveyor:	Chris Bylett and Associates
Building Type:	Existing Commercial Office

- Timber used during construction and installed in the building (such as plywood for concrete forming, doors, feature timber surfaces and cabinetry) is either recycled or comes from sources certified by the Forest Stewardship Council (FSC).
- Poly Vinyl Chloride (PVC) alternatives have been used to replace 60 per cent of the PVC that would normally be installed in such a building.

Emissions

- Using non-ozone depleting refrigerants in the building's cooling systems.
- Using insulation products that were made without ozone depleting gases in their manufacture or composition.
- Using the harbour to 'reject' heat from the building's heating, ventilating and air conditioning system (HVAC) to replace cooling towers and reduce water flow to the sewer.
- Minimising façade lighting and positioning it to prevent light spilling to neighbouring properties and the surrounding area.

Innovation

The building will be connected to an innovative district cooling system planned for The Rocks that will:

- Eliminate the risk of legionella by allowing the cooling towers in the building to be removed.
- Significantly reduce the amount of water used for air conditioning.
- Eliminate noise from the existing cooling tower.
- Remove the need for the use of biocides to clean the existing air conditioning system.
- Improve the aesthetics of The Rocks by removing clutter on the building's rooftop.





3. THE AUSTRALIAN GREEN BUILDING INDUSTRY

3.1 CLIMATE CHANGE AND BUILDINGS

There is now overwhelming scientific consensus and empirical evidence in support of the notion that human industry and activity is the main cause of accelerating global warming. The probability is that the world community has very little time in which to avoid the worst of the predicted impacts of climate change. Urgent worldwide action is needed to prevent catastrophe.

The Garnaut Draft Report on Climate Change² released on 4 July 2008 made several key points, including –

1. Climate change is happening faster than previously forecast and will accelerate unless global action is taken to stop it.
2. Australia is most vulnerable because it is so dry.
3. A market based scheme is the cheapest and most effective means of reducing emissions.

In developed countries like Australia where more than 80% of the population lives in cities and towns, as well as in developing countries which are experiencing rapid urbanisation, the global building stock represents both the greatest challenge and the biggest opportunity in tackling rising energy use and Greenhouse Gas (GHG) emissions.

Worldwide estimates of total energy use, atmospheric emissions, generation of waste and overall contribution to global warming are similar. As the largest single contributor, buildings:

- Use 32% of world's resources in construction.
- Use 40% of global energy (includes embodied energy).
- Generate 40% GHG emissions.
- Consume 12% of water.
- Make up 40% of waste to landfill.³

The commercial office and residential building sector alone is responsible for almost 23% of Australia's total GHG emissions.⁴

With the continuing trend to urbanisation, and with it, to air-conditioned and artificially lit workspaces, energy consumption and CO₂ emissions are rising strongly.

The Australian Greenhouse Office estimates that GHG emissions from buildings (in Australia) will increase by 94% in the period 1990-2010.

A wide range of predicted environmental changes as a result of climate change will impact on the building industry directly or indirectly through the adverse impacts on the economy. Directly, the building industry is faced with higher operational

costs due to more difficult and expensive insurance and higher storm damage, energy, water and management costs. In addition construction and demolition costs will increase due to rising oil prices and transportation costs, as well as increasing landfill charges.

Global and national policy and economic responses to climate change will need to employ a multi pronged approach. The building industry also needs to pursue all available options starting with those with highest return on cost.

All GHG stabilisation scenarios assessed by the Intergovernmental Panel Climate Change (IPCC) show that 60-80% of reductions would come from energy supply and use and industrial processes.⁵

The IPCC Fourth Assessment Report (Working Group 111) notes that –

1. The largest growth in GHG emissions between 1970 and 2004 has come from the energy supply sector (increase 145%).
2. While in the period 1970-1990 building emissions grew by 26% (and stayed fairly stable till 2004), the building sector has a high level of electricity use and therefore total direct and indirect emissions grew by a much higher rate of 75%.

-
- 3. By 2030 about 30% of the projected GHG emissions (from buildings) can be avoided with net economic benefit.
 - 4. Energy efficient buildings not only reduce demand upon infrastructure and CO2 emissions but they improve indoor and outdoor air quality, social welfare and enhance energy security.

The imperative to act is not purely based on environmental or social reasons. There are compelling economic and financial reasons to act now. Going green makes good national economic sense and good business sense at industry level.

The McKinsey & Company Report, An Australian Cost Curve for Greenhouse Gas Reduction, addresses the questions of extent, timing and cost of abatement measures for GHG emissions.⁶

The report's main findings include:

- 1. A significant reduction in Australian GHG emissions is achievable – 30% below 1990 levels by 2020 and 60 percent by 2030 - without major technological breakthroughs or lifestyle changes.
- 2. Reducing emissions is affordable – with an average annual gross cost of approximately AU\$290 per

household (2007 levels) to reduce emissions in 2020 to 30% below 1990 levels. This compares to an expected increase in annual household income of over AU\$20,000 in the same period. McKinsey's estimate that by 2020, almost 80 Mt, or 25% of the total reductions potential, can be realised with positive returns (or 'negative-cost') from simple energy-efficiency improvements in buildings and appliances.

- 3. Achieving significant emissions reductions requires prompt action from government, business and consumers - including rapid pursuit of negative-cost opportunities through incentives and regulation, fast-tracking the commercialisation of key technologies and accelerating effective information campaigns to drive changes in consumer behaviour.

These findings reinforced McKinsey's conclusions in a 2007 international review that found the following⁷:

- Taking a 25 year perspective, the power generation and manufacturing industries offer less than half the potential for reducing emissions.
- Almost a quarter of possible emission reductions would result from measures such as better insulation,

more efficient plant, lighting, fittings and management in buildings.

- Because building improvements can be done now, have immediate effect in reducing energy consumption and the lowest cost of all CO2 emission abatement measures, they are the most beneficial in terms of economic growth. But implementation requires regulations to support market initiatives and to ensure strict technical standards and rules for building energy efficiency.

It is obvious that building owners and developers are key players in the bid to decrease global emissions. In the case of new buildings it is increasingly accepted that sustainability is integral to financial success and many Green Star developments with the highest (current) standards of operational efficiency, natural light and indoor environmental quality are already accepted as good business sense. However, improving the efficiency and 'greening' the existing stock is the major challenge – and this was a key conclusion from the Green Cities 08 conference.

3.2 RAPID CULTURAL CHANGE

Reflecting the rapid growth in public awareness of climate change and the need to reduce GHG emissions, the property industry is quickly coming to understand the fundamental importance of buildings in tackling climate change. This increased knowledge has occurred across all sectors of the industry - made up of those who produce, develop, plan, design, build, alter, own or maintain the built environment, as well as building material manufacturers and suppliers, and end use occupiers.

Since the 2006 Report the new commercial building sector has, in the sustainability sense, turned on its head. Whereas developers, owners and tenants used to ask "why go green?" Now, if a non-green building is proposed they would ask "why isn't it green?".

The 2008 industry survey by BCI Australia, for the Green Building Market Report⁸ confirmed the increasing level of green building activity. The report noted that:

- 85% of Australian architects, contractors and building owners had been involved in green building;

- 66% of Australian construction and property professionals described their firm's commitment to green building as 'high' or 'very high'.

The heightened awareness in the community has flowed through to the corporate sector – from both general economic and occupier view points. The Business Council of Australia has encouraged corporations to factor the risks from climate change into their corporate strategies and business, if for no other reason than insurance purposes, and corporations are demanding green buildings for their tenancies.

The extent of the change is such that, while the term 'green' still conveys the nature of the trends, for new construction 'green' has been established as the new norm in CBD's – but suburban developers have been slower to change.

Perhaps the best indicator of the rapidly changing level of acceptance and adoption of green building practices is the increase in the numbers of buildings registered with and certified by the Green Building Council of Australia under the Green Star environmental rating system for buildings.

Green Star	Registered	Certified
Feb 2006 (Publication of D&S)	50	7
June 2007	270	27
June 2008	680	70

Table A. Green Star registered and certified project statistics

The fundamental shift in industry thinking and the quality and environmental performance demanded by the market has caused the Grade A office standard to be redefined.

The Property Council of Australia (PCA) (which prepares the Office Quality Grade Matrix used by the industry throughout Australia) recognised the market shift when it included the Green Star and NABERS Energy ratings (formerly known as Australian Building Greenhouse Rating System or ABGR) in the parameters and metrics for Grades A and Premium in 2005.⁹

The changed Australian market demand mirrors overseas experience. The McGraw Hill Construction Report 2007 "Greening of Corporate America" noted that U.S. companies are moving fast to embrace sustainability.¹⁰

Important observations include:

- Much of corporate America perceives green activities as part of their growth strategies.
- Other indicators of the increased corporate sustainability trend are more corporate reporting on environmental and sustainability policies, an increase in both voluntary initiatives

and the money directed toward socially responsible investments.

The McGraw Hill survey found that the market advantages of green are:

Market differentiation - over 50%
Operating cost benefits - 58%
Creation of innovative culture - 57%
Bottom line improvement - over 33%

The heightened community awareness and attitudes to climate change are reflected in new levels of corporate social responsibility and the recognition of the need and business benefits from providing a healthier and more productive work place.

A Colliers report "Lifeblood"¹¹ indicates that a tenant survey across the Brisbane, Sydney, Melbourne CBD markets found that the two highest ranking predicted future building requirements were more effective air-conditioning and building environmental performance. The second highest driver for premises selection is health and wellbeing of staff. But the survey also found that while over 70% of tenants were conscious of reducing energy consumption and GHG emissions only 26% had a process for evaluating the environmental performance of a prospective building. Colliers found that large organisations are most likely

to have an environmental sustainability policy that included property and that, across industry sectors, Government was the most conscious of environmental issues. As was to be expected, the demand for green is being led by the large, progressive corporations in the private sector as well as governments at all levels.

Perhaps the greatest impact has come from the various levels of government in implementing accommodation guidelines which set minimum standards for the procurement of office space for their own use. Leading this push are the South Australian, Victorian and Queensland governments which have set a minimum 5 Star Green Star standard for all government office accommodation. To a lesser degree, other state governments have set a minimum energy requirement as has the Federal Government which introduced a minimum 4.5 Star Australian Building Greenhouse Rating (now NABERS Energy) for office areas above 2000m². The current Federal Government's stated policy is that all new buildings will be 5 Star NABERS Energy). This standard, however, does not take into account other environmental issues that impact emissions and human health such as transport and indoor environment quality.

3.3 VALIDATING GREEN CLAIMS

While green buildings have become the new norm, the standards and performance specifications are increasing apace as the target cuts in GHG emissions become larger. Hence, the building industry is facing a continuing rise in demand for green building materials, products and services.

Another organisation that has benefited from growth in green building is the Good Environmental Choice Label (GECA) which in 2006 was known as the Australian Environmental Labelling Association. Products and materials play a major role in building green and manufacturers are now seeking third party validation of their environmental claims from GECA. GECA achieved an annual growth of around 100% for the last three years (based on number licenses granted), and the trends based on market demand and marketing activity indicate the same growth rate will continue into 2009.

During the course of the 2007- 2008 year the organisation created 17 new standards and has now rigorously commenced the revision of the organisations foundation standards after their second expiry round. GECA now has 42 different environmental performance standards covering goods and services.

According to GECA the market segment with the biggest uptake has been the building and interior fit-out product segments. They expect the strong growth in the number of new licensed products for the building industry to continue, as well as growing demand for cleaning and consumer products and services. The sharp rise in demand for third party certification whether it be Green

Star or GECA is a direct result of community concern over the state of the environment reaching unprecedented levels. As the market becomes more educated about the environment, so does the need for organisations to establish credibility for their green claims and those who 'green wash' are now being watched not only by consumers but also the Australian Competition and Consumer Commission (ACCC).

According to the ACCC deputy chair Louise Sylvan "any claims of compliance with a certification must be verifiable and preference should be given to schemes that have wide industry, or government acceptance. The general rule can be summed up as this. If you can't back a claim with verified scientific evidence, don't make it".¹²

3.4 GREEN BUILDING DEFINITION

The overall trend towards green buildings is clear, but as the 2006 Dollars and Sense report noted there has been confusion as to what constitutes a green building. Some confusion still exists.

The Green Building Council of Australia defines a green building as one that incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and occupants with strategies for addressing:

- 1. energy efficiency;**
- 2. greenhouse gas emission abatement;**
- 3. water conservation;**
- 4. waste avoidance, reuse and recycling;**
- 5. pollution prevention - noise, water, air, soil and light;**
- 6. enhanced biodiversity;**
- 7. reduced natural resource consumption;**
- 8. productive and healthier environments; and**
- 9. flexible and adaptable spaces.**

The Organisation of Economic Co-Operation and Development (OECD) defines green buildings as those that have minimum adverse impacts on the built and natural environment, in terms of the buildings themselves, their immediate surroundings and the broader regional and global setting.¹³

The Green Building Council of Australia has set the minimum standard for being formally certified as 'green' at 4 Star Green Star. Progression to 5 Star or 6 Star Green Star means that the building is greener and has a reduced environmental impact.

There is not a single or definitive green benchmark or building standard. The Green Star rating system recognises that there are shades or degrees of green. As industry knowledge, technology and acceptance of environmental sustainability principles increase, so new and refurbished buildings are becoming greener and so owners, developers and tenants are aiming for higher Green Star ratings. This trend will continue, and Green Star will continue to set higher standards and raise benchmarks as appropriate and in accordance with stakeholder engagement.

The critical point is that green buildings are the future – the new generation. They are neither niche nor in a different class. With the same general features as their predecessors, the differences are in attention to location, design and natural light, air quality, operational efficiency and technology, all of which are reflected in overall quality and a more effective use of resources.

Perhaps some confusion and incorrect perceptions about the meaning of green have been caused by the use of incorrect language within the industry. Often non-green buildings have been referred to as 'traditional' or 'conventional', the wrong inference being that green buildings are unconventional or in a different category. With green buildings being the new generation and conventional perhaps non-green buildings should be referred to as older generation or 20th Century (type) buildings.

The Green Building Council of Australia, OECD and other definitions of green allude to the theoretical ideal green or zero impact building but reflect the reality of transition and the need for the building industry to be pragmatic. The industry must start with a realistic level of green and progressively move to greener as building practices, technology and knowledge improve and the political, financial and regulatory environments develop.

The GBCA will lead the move to greener buildings by progressively lifting the criteria to reach its 4, 5 and 6 Star Green Star ratings.

BUILT ENVIRONMENT FACTS AND FIGURES^{14,15}

- Property in Australia was worth more than \$6 trillion in June 2008 representing two thirds of the nations total assets.
- The built environment is worth more than \$2.7 trillion in June 2008, about 250% of GDP.
- \$158 billion will be spent on new construction in Australia in 2008.
- The market value of Australia's homes is \$2.7 trillion.
- More than 1 in 2 Australian's own the nation's commercial property assets.
- More than 1 million people are employed in the nation's construction industry.
- Almost \$26 billion is paid annually in property taxes.
- Commercial office and residential building occupants account for around 23% of Australia's total greenhouse gas emissions.
- Greenhouse gas emissions will more than double by 2050.
- Australia's construction industry has the 2nd lowest R&D of all sectors, just 1.5%.
- Time delays in development approvals can add 15% to total development costs.

InterfaceFLOR

The world's leading maker of modular carpet InterfaceFLOR is transforming itself from a traditional "smokestack" industry to one synchronised with our environment. It's an extraordinary ongoing journey driven from the top down. InterfaceFLOR is a company that has proven profit and principles can sit side by side.

The Beginning

It was in 1994 Ray Anderson had a "spear in the chest" moment – an epiphany. While reading Paul Hawken's The Ecology of Commerce it became crystal clear to Anderson that his company InterfaceFLOR could no longer continue doing "business as usual" at the expense of the planet. His primary concern was the role that business has played in the deterioration and degradation of our natural environment and the need for business to come up with solutions to these issues. Anderson recognised that his own business, making modular carpet on four continents and operating in 100 countries, was a very material-intensive business. In 1994 around half of the material used to produce InterfaceFLOR's products was burnt and another large portion was wasted. Anderson also accepted that this business model was unsustainable and out of step with nature, and therefore was ultimately working against the organisation. While Interface acted in compliance with environmental law, it did not venture too far beyond it as an essential principle of the business.

That moment of recognition set InterfaceFLOR on a radically different course, culminating in Mission Zero – a pledge to eliminate any negative impact the company may have on the environment by 2020. This required a change in all of the organisation's dimensions - in people, product, process, the planet and of course profits. Anderson likens the journey to climbing a mountain – Mount Sustainability - the peak of which is defined as the point of zero environmental impact.

A Change in Thinking

Mission Zero is a vision and philosophy that influences every business decision

InterfaceFLOR makes from raw material extraction and processing, internal manufacturing, transportation and distribution, use, re-use, maintenance and recycling or final disposal.

It required a complete re-imagining and re-designing of everything InterfaceFLOR does to develop production systems that dramatically reduce the burdens placed upon living systems.

So how did InterfaceFLOR, a company with sales of more than \$1 billion a year, integrate traditional business practices with the need to take into account the other bottom lines of the environment and responsibility?

It approached it like any other business challenge, starting off with a vision for the future and developing a strategy in order to get there. So in 1994, it developed seven strategies which are still in place today.

At the top of the list is eliminating all forms of waste. InterfaceFLOR defined this as anything created by or resulting from excess. Every part of the process – sourcing, producing, making, delivery, selling a product the customer wouldn't readily pay for - is defined as waste. This activity has helped the organisation save \$350 million so far. This boost to the bottom line has allowed the company to continue its investment in Mission Zero.

According to InterfaceFLOR Asia Pacific Managing Director Rob Coombs "the best thing you can do as a materials-based business is use less stuff – the multiplier effect is enormous."

'Closing the loop' is another important strategy adopted by InterfaceFLOR. The company has taken ownership of the product throughout its entire lifecycle - from the source of materials to what happens to it at the end of its life. InterfaceFLOR aims to get to the point where it never takes another drop of oil from the earth by utilising the natural cycle and redesigning processes and products to close the technical loop.

InterfaceFLOR has pioneered the industry's most successful carpet recycling program, known as ReEntry, which harvests

reclaimed carpet – both the carpet backing and face cloth - and recycles each into new product. "Clearly you have to have ownership of the whole lifecycle of your product. We know exactly how much CO₂/m² of carpet is generated right from the start of the process from our raw materials, through to the manufacture of the carpet, delivery to the customer, maintenance throughout its life and finally its disposal," commented Rob Coombs. "You have to take ownership of the whole process and of the whole product."

Another of Interface's sustainability initiatives helps spur the rest into action - that is to energise people both inside and outside the organisation. Without the full engagement of everybody in the organisation a change in approach, a change in mentality of this type can't happen. You can't dictate values and beliefs in this area.

The support and cooperation of the organisations within Interface's supply chain – upstream and downstream within the wider community – is also important. It is in effect creating a "green ripple effect" by asking its suppliers and customers to join in reducing their ecological footprint.

One of the most challenging of the seven fronts of sustainability was to create only benign emissions. Interface wanted to use only renewable energy efficient transportation but this issue has proven the least within the organisation's control. As a means of navigating this obstacle the company has bridged this gap through carbon offsets.

The Results

The results speak for themselves. Since Mission Zero started InterfaceFLOR has:

- As a global company, reduced its greenhouse gas emissions by 82% in total – despite growth.
- In Australia, reduced greenhouse gas emissions by 25%, despite growing four-fold in size.
- Reduced water consumption by 48%.
- Decreased fossil fuel energy use by 45%.
- Sourced 20% of materials from renewable resources.

- Become Australia's first climate-neutral manufacturer.
- Tactiles - glue free installation method reduces the environmental footprint by 95% when compared to traditional glue.
- I 2's random installation reduces waste by 90% compared to broadloom.
- Seen sales rise by two-thirds and profits double.

The Journey Continues

InterfaceFLOR's sustainability journey has delivered on many fronts – including the environment, the bottom line, attracting and retaining quality staff and encourages other companies to join the journey. Leadership is key to this effort.

Rob Coombs says: "It really is a fundamental shift of thinking that needs to be on the agenda – regularly, frequently. So leadership is a must."

InterfaceFLOR has learnt over time that the triple bottom-line of profit, environmental and social responsibility is not a compromise – it is mutually supportive. "We're convinced that Interface has got a much stronger business as a result of our philosophy and our action. It's more productive, has better people, has more customers and it's growing faster than it otherwise would have done," Mr Coombs said.

"You have to approach this as you would any other business challenge – by balancing short-term imperatives with longer term vision and establishing priorities."

InterfaceFLOR is about halfway through its journey timeframe and about halfway up the mountain to Mission Zero – and as many would note – the last half of the journey is the most difficult.

"We have moved past the low-hanging fruit and now begin the more difficult challenges," Mr Coombs concluded. InterfaceFLOR last year became Australia's first 100 per cent carbon neutral manufacturing company. For more information on InterfaceFLOR and its Mission Zero journey visit:

www.interfaceflor.com.au





4.1 HISTORY

In response to the need for a national approach to building green a number of industry and government agencies conceived the idea of a not-for-profit organisation to provide an integrative framework and a national environmental rating system for buildings. The end result was the formation of the Green Building Council of Australia which was launched at the end of 2002.

The GBCA's mission is to define and develop a sustainable property industry in Australia and to drive the adoption of green building practices through market-based solutions.

Central to the work of the GBCA is the development and operation of the Green Star environmental rating system for buildings, the only national holistic environmental rating scheme for buildings in Australia.

Based on international rating systems from the UK and US, Green Star separately evaluates the environmental initiatives of projects based on credits within nine environmental impact categories:

1. Management
2. Energy efficiency
3. Water efficiency
4. Indoor Environment Quality
5. Transport
6. Material selection
7. Land Use and Ecology
8. Emissions
9. Innovation

Green Star established a common language and standard of measurement for green buildings in Australia. It promotes integrated, whole-building design and identifies building life-cycle impacts.

Most importantly Green Star rating tools are voluntary. They are also targeted at driving the market to pull standards above typical practice and allow regulatory bodies such as the Building Code of Australia to introduce higher minimum environmental standards.

4.2 PROGRESS

Since 2006 the Green Building Council of Australia has made dramatic progress in pursuing its mission to define and develop a sustainable property industry and achieve market acceptance of Green Star as the national comprehensive environmental rating scheme for buildings in Australia.

In 2007, the GBCA expanded its mission to position Australia as a world leader in sustainable building.

There is now widespread acceptance of the unique and fundamental strength of the Green Star system, which is based on the underlying principle that any strategy to move towards a more environmentally sustainable building industry must start with integrated building design and construction.

The other great strength of Green Star is that it will cover all building types. While the initial focus was on office buildings, rating tools are now being trialled and developed for industrial, retail, education, health, residential and other building uses.

Considered a leading authority on green buildings, demand for the Green Building Council of Australia's Green Star education and associated support services has continued to grow at a rapid pace. As at 30 June 2008, the GBCA had recorded:

- 615 member organisations (both government and private);
- 9504 industry representatives trained in the use of Green Star;
- 2814 Green Star Accredited Professionals;
- 680 registered Green Star projects;
- 70 certified Green Star projects;
- 55 full time staff.

To respond to growth in membership and demand for services the Green Building Council of Australia has established permanent offices and staff in Sydney, Melbourne, Queensland and Canberra as well as Perth. Almost 50% of GBCA staff members work within the Green Star

team to keep pace with the demand for new and revised tools as well as project certification.

The new commercial office sector has already widely adopted green building principles and the Green Star rating tool is widely accepted as the industry standard. Increasingly, the developers of commercial buildings are aiming beyond the best practice 4 Star Green Star certified rating, and are trying to achieve a 5 or 6 Star Green Star rating. 'Green Star' is now part of common industry language and is the benchmark standard for measurement of green buildings, to promote integrated, whole-building design; and to identify building life-cycle impacts.

The Green Building Council of Australia has acted on the challenges and barriers outlined in Dollars & Sense 2006 as follows:

- **Green Star for all Sectors** – The GBCA continues to work towards establishing Green Star as the tool of choice across Australia for all major sectors.
- **National Standards** – The GBCA continues to work closely with government agencies and committees such as the Building Ministers Forum to increase national minimum standards within the Building Code of Australia to ensure a better sustainability outcome in Australia's buildings.
- **National Product Labelling** – Dedicated and qualified personnel are working with industry on labelling and performance standards of materials and products to further improve overall environmental performance of buildings.
- **Professional Education** – The GBCA has delivered a large number of successful conferences (Green Cities), seminars and workshops to further educate the industry on green building. The Green Star Accredited Professional training courses have been expanded and are still selling out across the country. It has also worked with other professional associations to deliver joint education events (including Green Cities which is in collaboration with the PCA). GBCA staff are asked regularly to present at industry conferences and seminars Australia wide.
- **Improved Valuation Techniques** – Efforts to foster greater valuer awareness and accurate valuations have included conferences, working with RICS and API and commissioning the research paper Valuing Green – which was released at Green Cities 08.
- **Leadership and Partnership** – The GBCA has encouraged governments to provide leadership and to work closely with the property industry to develop effective policies and regulation. The GBCA is also an active participant in the Australian Sustainable Built Environment Council (ASBEC) which comprises industry leaders representing a cross section of the built environment. The GBCA also established the Green Star Business Partnership (refer to page 26 for more information on this initiative) and is a partner of the Built Environment Meets Parliament (BEMP) initiative (refer to section 11.5.1 for more information).
- **Leadership by Example** – The GBCA has assisted in the development of accommodation guidelines for government occupied premises, and commissioned a benchmark study comparing the policies and enacted commitments in the various states. Most jurisdictions, including the Commonwealth, have adopted accommodation guidelines which support green building. Green Star has been adopted into the accommodation guidelines in Victoria, South Australia, Queensland and is under consideration in Western Australia.
- **Carbon Trading** – Following the release of the Carbon Pollution Reduction Scheme (CPRS), GBCA will continue to work with Government and industry to ensure buildings are addressed through the Emissions Trading Scheme (ETS). Refer to the GBCA's position paper on the built environment and the ETS (released September 2008).
- **Complementary Measures** – The GBCA is on the ASBEC Climate Change Task Group which is currently finalising a paper on identifying a range of complimentary measures which will work in conjunction with the CPRS to further encourage building owners, tenants and developers to adopt green practice. These measures are designed to ensure the built environment is in a position to take advantage of the opportunities presented by emissions trading.

A suite of Green Star Rating tools for the different phases of commercial Class 5 office developments has been completed and includes:

- **Green Star – Office Design v3:** for the design phase of new or refurbished offices.
- **Green Star – Office As Built v3:** for the construction and procurement of new or refurbished offices.
- **Green Star – Office Interiors v1.1:** for tenant fitouts, and more of the issues involved in commercial offices which the tenant can have control over.
- **Green Star – Office Extension:** to rate the extension of existing commercial offices.

Version 3 (v3) of the Green Star – Office Design and As Built commercial office rating tools was released in February 2008. These tools are the latest generation of tools which are more robust, more relevant and easy to use.

Green Star recognises and rewards leadership within green building design and construction, and it is only through constant revision of the tools that the GBCA can keep re-defining industry best practice.

The new version of the rating tools includes new credits to encourage smarter sustainable design and to incorporate international innovation, including design for disassembly, reuse of materials and dematerialisation.

A number of benchmarks were also increased to represent changing national concerns, including water and energy. Reuse of water is now essential to achieve full credits under the water category, and greater greenhouse gas emission reductions are necessary to gain full credits in the energy category.

To ensure these tools are easier to use, the Green Building Council of Australia combined the two Green Star tools into one technical manual and one Excel spreadsheet, and included specific checklists to highlight the clear relationship between Green Star – Office

Design and Green Star – Office As Built documentation requirements.

The final tool to be finalised to complete the office suite is the Green Star – Office Existing Building tool which is in EXTENDED PILOT format and is currently being finalised.

In addition to the commercial office tools the Green Building Council of Australia recently released the following tools for other sectors:

- **Green Star – Retail Centre v1:** for the design phase of new or refurbished shopping centres as well as extensions (previously known as Green Star – Shopping Centre).
- **Green Star – Education v1:** for the design and fitout of campus style buildings such as schools and universities.

New Green Star rating tools continue to be developed and are currently being tested on the market including:

- **Green Star – Healthcare PILOT**
- **Green Star – Public Building Design PILOT**
- **Green Star – Multi Unit Residential PILOT**
- **Green Star – Industrial PILOT**
- **Green Star – Mixed Use PILOT**

In August 2008 the Green Building Council of Australia board approved the following Green Star rating tools for development in 2009:

- **Green Star – Hotels and Resorts**
- **Green Star – Airports**
- **Green Star – Precinct/Neighbourhood/Communities**
- **Green Star – Retail Interiors**

It is expected that by 2011, there will be a single Green Star rating tool which can be adopted to each stage of a building's function and assessment; Design, As Built, Interior and Existing. With one single Green Star rating tool, as an adaptable, robust, easy-to-use and yet relevant means of appraisal, the GBCA can help transition the property industry towards more sustainable practice as never before.

GREEN STAR BUSINESS PARTNERSHIP

The Green Star Business Partnership is an initiative by the Green Building Council of Australia in which organisations commit to supporting sustainability within the built environment by:

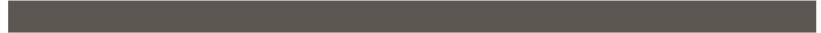
- Ensuring all newly constructed buildings in its property portfolio meet a Green Star rating, using Green Star – Office Design and Office As Built rating tools it owns, and Green Star – Office Interiors for buildings it occupies.
- Raising the performance of new and existing established buildings in its portfolio that undergo a major refurbishment.
- Transparently reporting the performance of its office property portfolio – owned or occupied – against the Green Star criteria.

The first ten signatories of this initiative include:

- Colonial First State Global Asset Management
- Dexus (previously DB RREEF)
- Investa
- ISPT
- Lend Lease
- Multiplex
- Stockland
- Sydney Harbour Foreshore Authority
- Sydney Olympic Park Authority

For more information about this initiative or to sign up and become a Green Star Business Partner email:

info@gbca.org.au.



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"Green Star is so simple and easy to understand that every project can do it - you don't need to be a scientist. It should be intrinsic to your design process"

Ché Wall - Managing Director Lincoln Scott,
Co-founder and Director Green Building
Council of Australia



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Office As Built v3



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Office Existing Building PILOT



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Retail Centre v1



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Healthcare PILOT



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Mixed Use PILOT



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