



Climate Change Team
GPO Box 1047
ADELAIDE SA 5001

Submitted via email to: climatechange@sa.gov.au

19 October 2015

Dear Sir / Madam,

RE: A NEW CLIMATE CHANGE STRATEGY FOR SOUTH AUSTRALIA

Thank you for the opportunity to provide comment on the consultation papers to help inform the development of a new *Climate Change Strategy (Strategy)* for South Australia (SA). The Green Building Council Australia (GBCA) commends the South Australian Government on the series of discussion papers which provide the background and set out the issues to be considered in the development of SA's new *Strategy*. The GBCA supports initiatives that aim to improve energy efficiency and decrease greenhouse gas emissions associated with the built environment. A reduction in energy use can be readily achieved through the design and construction or refurbishment of a building.

The GBCA applauds the great work that the SA Government has achieved to date, including a nine per cent carbon pollution reduction since 1990 and the introduction of the *Climate Change and Greenhouse Emissions Reduction Act 2007*, which made SA the first Australian jurisdiction to introduce specific climate change legislation that sets a long-term emissions reduction target. The GBCA supports such legislation and would like to assist in any way we can to help the SA Government ensure its objectives are met.

This submission provides an overview of three of the Green Star rating tools (Green Star – Design & As Built, Green Star – Interiors and Green Star – Performance). The SA Government has an opportunity to lead the way by certifying government buildings as well as supporting industry to deliver buildings that meet best practice benchmarks to help achieve the goals of the *Strategy*. The GBCA would like to work closely with the SA Government to identify opportunities to work collaboratively to achieve the outcomes of the *Strategy* across a number of government departments and the SA built environment sector.

About the GBCA

The GBCA is the nation's authority on sustainable buildings, communities and cities. Our mission is to accelerate the transformation of Australia's built environment into one that is healthy, liveable, productive, resilient and sustainable. We work together with industry and government to encourage policies and programs that support our mission. We educate thousands of people each year on how to design and deliver sustainable outcomes for our buildings, communities and cities. We operate Australia's only national voluntary and holistic rating system for sustainable buildings and communities – Green Star.

The GBCA is a founding member of the World Green Building Council (WorldGBC) and there are now over 100 Green Building Councils across the globe. In 2014 the WorldGBC released a report titled *Health, Wellbeing and Productivity in Offices*. The report finds that a range of factors – from air quality and lighting, to views of nature and interior layout – can

affect the health, satisfaction and job performance of office workers. The industry is increasingly realising that buildings are built for people and if building owners choose not to consider these benefits, tenants now have a greater voice and opportunity to influence these decisions. I have enclosed a copy of this summary report for further information.

Emissions in the built environment

In 2013, the GBCA conducted a study of data from Green Star-certified buildings in order to quantify the overall impact of the rating system on greenhouse gas emissions, operational energy usage, operational water consumption and construction and demolition waste. The study compared data from 428 Green Star-certified projects with buildings that just meet average or minimum practice standards. The methodology and findings have been peer-reviewed for accuracy and independent consulting firm Net Balance. Please find enclosed for further information a copy of the *Value of Green Star: A Decade of Environmental Benefits, Research Key Findings (2013) report*. Key findings of the report include:

- On average, Green Star-certified buildings produce 62 per cent fewer greenhouse gas emissions than average Australian buildings
- On average, Green Star-certified buildings use 66 per cent less electricity than average Australian buildings
- On average, Green Star-certified buildings use 51 per cent less potable water than if they had been built to minimum industry requirements
- The higher the Green Star-certified rating of a building the greater the environmental savings across all key areas – greenhouse gas emissions, energy use, water consumption and construction and demolition waste.

The discussion papers identify that over 20 per cent of emissions in SA come from buildings, with data indicating that the commercial and residential sector is responsible for 23 per cent of Australia's greenhouse gas emissions. The SA Government has a target to increase the overall energy efficiency of its buildings by 30 per cent by 2020, compared to 2002-2003 levels. A report released by ClimateWorks in 2010, identified that the most cost-effective of all greenhouse gas emissions abatement opportunities is the retrofitting and refurbishing of commercial properties.

Leading by example

The SA Government is leading by example with the recent announcements to transform Adelaide into the world's first carbon neutral city (more on this later in the submission) and the introduction of Building Upgrade Agreement (BUA) legislation, as part of the \$1.9 million election commitment to drive investment in sustainable commercial buildings in the state. The uptake of BUAs in Victoria and New South Wales (NSW) has been below expectations, but if SA can learn from, and build on, the experiences in other jurisdictions to find new ways to encourage building owners to consider using BUAs, this mechanism can become an important element in a coordinated approach to improving existing building stock.

The SA Government has demonstrated its commitment to lowering carbon as well as achieving a range of best practice outcomes with several significant projects in recent years. The Flinders Medical Centre - New South Wing was the first healthcare facility to achieve certification under the Green Star – Healthcare rating tool. The New Royal Adelaide Hospital is set to be the first whole hospital certified in Australia using the Green Star – Healthcare Design rating tool. Renewal SA has also shown remarkable leadership through its commitment to achieve Green Star – Communities ratings for Bowden Village and Tonsley Park. The Bowden Development, situated on the western edge of the Adelaide City Parklands, is redefining sustainable living in SA. Bowden is aiming to achieve a 5 Star Green Star – Communities rating and all buildings within the precinct, from offices through to retail outlets and residential developments must achieve 5 Star Green Star 'Australian Excellence' sustainability benchmarks. Tonsley Park was awarded the first

6 Star Green Star – Communities rating for an urban renewal project. Tonsley has become one of Australia's first 'Living Laboratories' through collaboration between Renewal SA, University of South Australia and the Low Carbon Living CRC. The project brings together industry, government and researchers to find collaborative solutions to low carbon outcomes in the built environment. I have enclosed a copy of the Flinders Medical Centre and Bowden Village case study's for further information.

A 2014 study of SA residents conducted by the Online Research Unit on behalf of the GBCA found that 99 per cent of those surveyed in SA think it is important for our schools to be efficient, healthy and cost effective, with 54 per cent believing it is very important for children to be learning in a green school.

100 per cent of people in SA think it is important for hospitals to be efficient, healthy and cost effective, while 54 per cent of those surveyed think it is very important for our patients and healthcare staff to be in a green facility.

98 per cent of people in SA surveyed think it is important that government office accommodation is also efficient, healthy and cost effective. 47 per cent surveyed think it is very important for government buildings to be green.

The Green Star rating system

The first Green Star rating tool was released in 2003 in response to market demand for a rating tool that would evaluate the sustainable design and construction of buildings as well as establish a common language for buildings. Green Star rating tools can be applied to almost all building types, with almost 1000 projects having now achieved Green Star certification across Australia, with 136 Green Star-certified projects in SA and a further 12 projects registered.

The Green Star rating system is designed to take a holistic approach within each class and building sector, addressing nine categories in total; Management, Indoor Environment Quality (IEQ), Energy, Water, Materials, Land Use and Ecology, Emissions, Transport and Innovation and defining 'best practice' in each.

Government has a responsibility to provide visionary leadership, in particular by setting contemporary benchmarks and rigorous standards. Third party certification, such as that offered by Green Star, ensures that Government departments can meet community expectations and demonstrate long-term fiscal responsibility and accountability for the buildings they own, occupy and develop.

Green Star – Design & As Built

The GBCA launched Green Star – Design & As Built into the Australian market in 2014. Green Star – Design & As Built has been developed to rate the design and construction of any building, including offices, public buildings, retail centres, aquatic centres and multi unit residential buildings. Green Star – Design & As Built certification identifies projects that have demonstrated the achievement of a set of industry-agreed best practice sustainability benchmarks.

The Green Star – Design & As Built 'Management' category promotes the adoption of environmentally sustainable principles from project inception, through to the design, construction, commissioning, tuning and operational phases of the buildings lifecycle. The category aims to highlight the importance of an holistic and integrated approach to the design and construction of environmentally sustainable buildings.

The Green Star – Design & As Built 'Energy' category aims to reward projects that are designed and constructed to reduce their overall operational energy consumption below that of a comparable building standard-practice building. Such reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well a reduction in operating costs for building owners and occupants. Through the 'Energy' category, Green Star – Design & As Built aims to facilitate reductions in greenhouse gas emissions by

facilitating efficient energy usage and encouraging the utilisation of energy generated by low-emission sources.

Adelaide's newest office, 185 Pirie Street, was the first project to achieve a Green Star – Design & As Built Design Review and has since achieved a 5 Star Green Star – Design & As Built certification. I have enclosed a copy of this project's case study for further information.

Green Star – Interiors

Green Star – Interiors is a rating tool developed to rate the design and construction of any building fitout works. Green Star – Interiors aims to assist clients and project teams to achieve and rate their sustainability goals for their project, encourage a new approach to designing and constructing fitouts by rewarding sustainability best practice and excellence, and provide consistent and clear advice in an easy to use manner.

The Green Star – Interiors 'Management' category encourages and rewards the adoption of practices and processes that enable and support best practice sustainability outcomes throughout the different phases of a project's design, construction and its ongoing operation. Throughout the 'Management' category, Green Star – Interiors intends to improve a project's sustainability performance by influencing areas where decision-making is critical. This category also promotes practices that ensure a project will be used to its optimum operational potential.

The Green Star – Interiors 'Energy' category aims to reward projects that are designed and constructed to reduce their overall operational energy consumption below that of a comparable standard-practice fitout. Such reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well as reductions in operating costs for fitout owners and occupants. Through the 'Energy' category, Green Star – Interiors aims to facilitate reduction in greenhouse gas emissions by facilitating efficient energy usage and encouraging the utilisation of energy generated by low-emission sources.

The SA Police HQ achieved a 5 Star Green Star Office rating back in 2013. The environmental sustainable design initiatives in this project included daylight and glare control through blinds and shading, high-efficiency T5 lighting, passive chilled beams for cooling and low-VOC finishes throughout.

Green Star – Performance

Green Star – Performance assesses the operational performance of existing buildings across the nine Green Star impact categories. Green Star – Performance enables building owners and managers to identify pathways to improve the environmental and financial sustainability of their assets over time. As identified in the discussion papers, over 20 per cent of emissions in SA come from buildings and the government has a target to increase the overall energy efficiency of its buildings by 30 per cent by 2020. This demonstrates the opportunities that exist for Green Star – Performance not only for government owned buildings, but other sectors as well.

The Green Star – Performance 'Management' category encourages and rewards the adoption of practices and processes that enable and support best practice sustainability outcomes throughout a buildings ongoing operation. It is intended that credits within this category will improve a project's sustainability performance by influencing areas where decision-making is critical. This category rewards the implementation of policies, procedures, targets, strategies and actions to ensure that the building will operate optimally.

The Green Star – Performance 'Energy' category aims to reward building owners implementing strategies and taking actions to measure and reduce a buildings operational energy use, below that of a comparable standard-practice building. Such reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well as reductions in operating costs for building owners and occupants.

It is worth noting that for eligible buildings, NABERS Energy ratings are used to satisfy performance data requirements within the Green Star – Performance Energy category. Where buildings are not able to obtain NABERS Energy ratings, Green Star – Performance sets out a number of alternative pathways for project teams to provide energy performance data.

There are currently six Green Star – Performance certified projects in SA, with Roma Mitchell House also registered to achieve a Green Star – Performance rating.

Wollongong City Council in NSW was the first government body to achieve a Green Star – Performance rating for their Council Administration Building. This building was first occupied in 1987 and is proof that older buildings can be green buildings. As Wollongong Council's Lord Mayor, Gordon Bradbury OAM stated, 'Council has demonstrated to the local industry and to the community that you can gain Green Star ratings with an ageing building if you use the right methods and programs'. I have enclosed a copy of the Wollongong Council Administration Building case study for further information.

The GBCA are currently finalising opportunities for project teams for whom full Green Star – Performance certification may not be suitable to achieve 'Impact' ratings. 'Impact' ratings will provide an opportunity to measure performance based on the Green Star Energy, Waste and Water credits. The GBCA looks forward to discussing this with the SA Government in further detail once 'Impact' ratings are released onto the market.

Carbon Neutral Adelaide

The GBCA applauds the SA Government and Adelaide City Council (ACC) on the recent announcement to transform Adelaide into the world's first carbon neutral city. The GBCA notes the great work that ACC has already taken a significant amount of work in this space with the *Go Green With Energy Adelaide City Council Carbon Neutral Council Action Plan 2008-2012*. Achieving carbon neutrality is an ambitious goal and the GBCA understands that government alone can not achieve this. The GBCA would like to work closely with the SA Government, ACC and other sectors to assist in developing the framework and action plan (in particular the opportunities for buildings and precinct-scale development) to achieve carbon neutrality that is relevant, realistic, coordinated, transparent and achievable.

The GBCA has worked with a number of government and industry stakeholders to assist them in developing policies, programs and plans that aim to encourage leadership and accelerate the uptake of activities that lead to more efficient, healthy and productive buildings.

In early 2015, the Australian Government Department of Industry and Science and the GBCA brought together around 50 industry and government stakeholders, for a workshop to discuss how industry and all levels of government can work together towards improving energy efficiency and productivity in the mid-tier commercial office buildings sector. A pathway document and report which provides an overview of the current situation in this sector and the opportunities for actions and improvements will be made available within the coming months. The GBCA looks forward to sharing this with the SA Government and looking at ways that a range of actions can improve the mid-tier commercial office buildings sector and assist in Adelaide becoming the world's first carbon neutral city.

The GBCA worked closely with the City of Port Phillip in Victoria, who demonstrated great leadership in the development of their *Sustainable Design Strategy (Design Strategy)*. The *Design Strategy* reinforces council's philosophy of creating sustainable buildings which contribute to improved urban environments early in the design process, where the most economical and sustainable outcomes can be achieved.

The GBCA commends the work the SA Government has undertaken on the consultation papers to develop a new *Climate Change Strategy For South Australia*. The SA Government demonstrates great leadership in sustainability through its work on developing policies and

strategies such as this, supporting and encouraging sustainable development within SA and particularly the Adelaide CBD.

I encourage the SA Government to look upon the GBCA as the primary sustainable building and communities resource and would welcome the opportunity to discuss the *Strategy* and how the GBCA can assist in Adelaide becoming the world's first carbon neutral city. Please do not hesitate to contact me, or Luke Farr, Manager - Advocacy on 02 8239 6200, or via email at luke.farr@gbca.org.au, for further information, or to arrange a meeting.

Yours sincerely,

A handwritten signature in blue ink that reads "Katy Dean". The signature is written in a cursive, flowing style.

Katy Dean
Director – Advocacy
katy.dean@gbca.org.au



Health, Wellbeing & Productivity in Offices

The next chapter for green building
Key Findings

September 2014

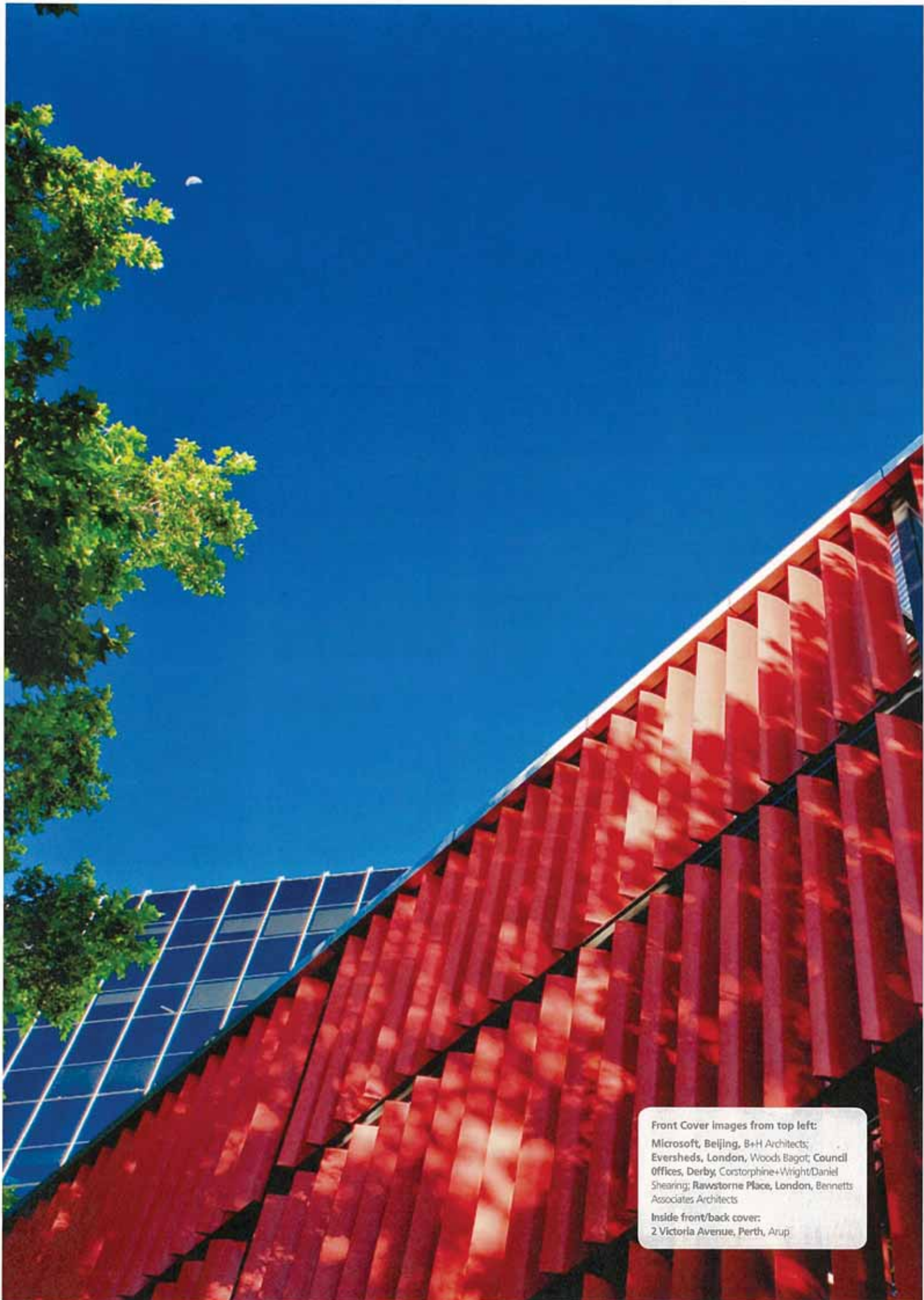
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Introduction

It has long been considered the ultimate yet seemingly out of reach test of the business case for green building: if the human benefits could be reliably quantified this would prove beyond all doubt the ROI for investing in building green.

This report does not claim to put this argument completely to rest, but it does put forward the best and latest information on the building design features that are known to have positive impacts on the health, wellbeing and productivity of office occupants and points to financial implications where possible.

Further – and what distinguishes this report from others – it provides a high-level framework for building owners, occupiers and their advisors to start tracking the impacts of buildings on employee health, wellbeing and productivity in order to use that information in financial decision-making.

In other words, it sets the groundwork for businesses to begin to answer this tantalising question as to the true payback for building green.

This has been made possible by our sponsors, and an extensive team of experts from the around the Green Building Council global network, who have given up their time to review evidence, debate recommendations and produce this report.

Key Findings: Health, Wellbeing, Productivity and the Business Case



A healthy, happy workforce is a vital component of a productive, successful business in the long-term.

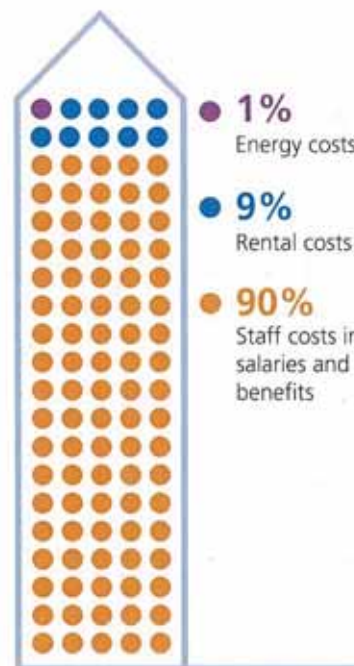
The significance of health, wellbeing and productivity for businesses

There can hardly be anything more important than our own health and wellbeing, and that of our loved ones. For most employers meanwhile, a healthy, happy workforce is a vital component of a productive, successful business in the long-term.

Staff costs, including salaries and benefits, typically account for about 90% of a business' operating costs (as the diagram shows). It follows that the productivity of staff, or anything that impacts their ability to be productive, should be a major concern for any organisation.

Furthermore, it should be self-evident that small differences can have a large effect. What may appear a modest improvement in employee health or productivity, can have a significant financial implication for employers. This equation is at the heart of the business case for healthy, productive offices, to which we return later.

Typical business operating costs¹



10% Variation

A 10% variation applied equally to each cost has a far from equal impact

+/- 0.1%

Energy costs

+/- 0.9%

Rental costs

+/- 9.0%

Staff costs



Santos Headquarters, Adelaide, GBC Australia

Costs of ill-health vary by sector and country, and are rarely comparable, but the impact is clear:

- The annual absenteeism rate in the US is 3% per employee in the private sector, and 4% in the public sector, costing employers \$2,074 and \$2,502 per employee per year respectively²
- Poor mental health specifically costs UK employers £30 billion a year through lost production, recruitment and absence³
- The aggregate cost to business of ill-health and absenteeism in Australia is estimated at \$7 billion per year, while the cost of 'presenteeism' (not fully functioning at work because of medical conditions) is estimated to be A\$26 billion⁴.

Relationship between the office building and its users

It is the impact of the workplace – the office building – on the workforce, which is at the heart of this report.

There is overwhelming evidence which demonstrates that the design of an office impacts the health, wellbeing and productivity of its occupants. For many readers, that will sound so obvious it almost goes without saying. But it does need saying, loud and clear, because this evidence has not yet had a major influence on the mainstream real estate sector, and is not yet translating at scale into design, finance and leasing decisions, certainly not in all parts of the globe.

Furthermore, our understanding of the health, wellbeing and productivity implications of office design is deepening, aided by advances in technology and a growing awareness amongst a small number of enlightened developers, owners and tenants. For instance, it is increasingly clear that there is a difference between office environments that are simply not harmful – i.e. the absence of 'bad' – and environments that positively encourage health and wellbeing, and stimulate productivity.

Evidence is summarised on the following two pages, although care has to be taken to apply this in local geographical contexts. What has been clear throughout is the importance of climatic and cultural differences to design and the working environment.

There is overwhelming evidence which demonstrates that the design of an office impacts the health, wellbeing and productivity of its occupants.



Key Findings: Health, Wellbeing, Productivity and the Business Case

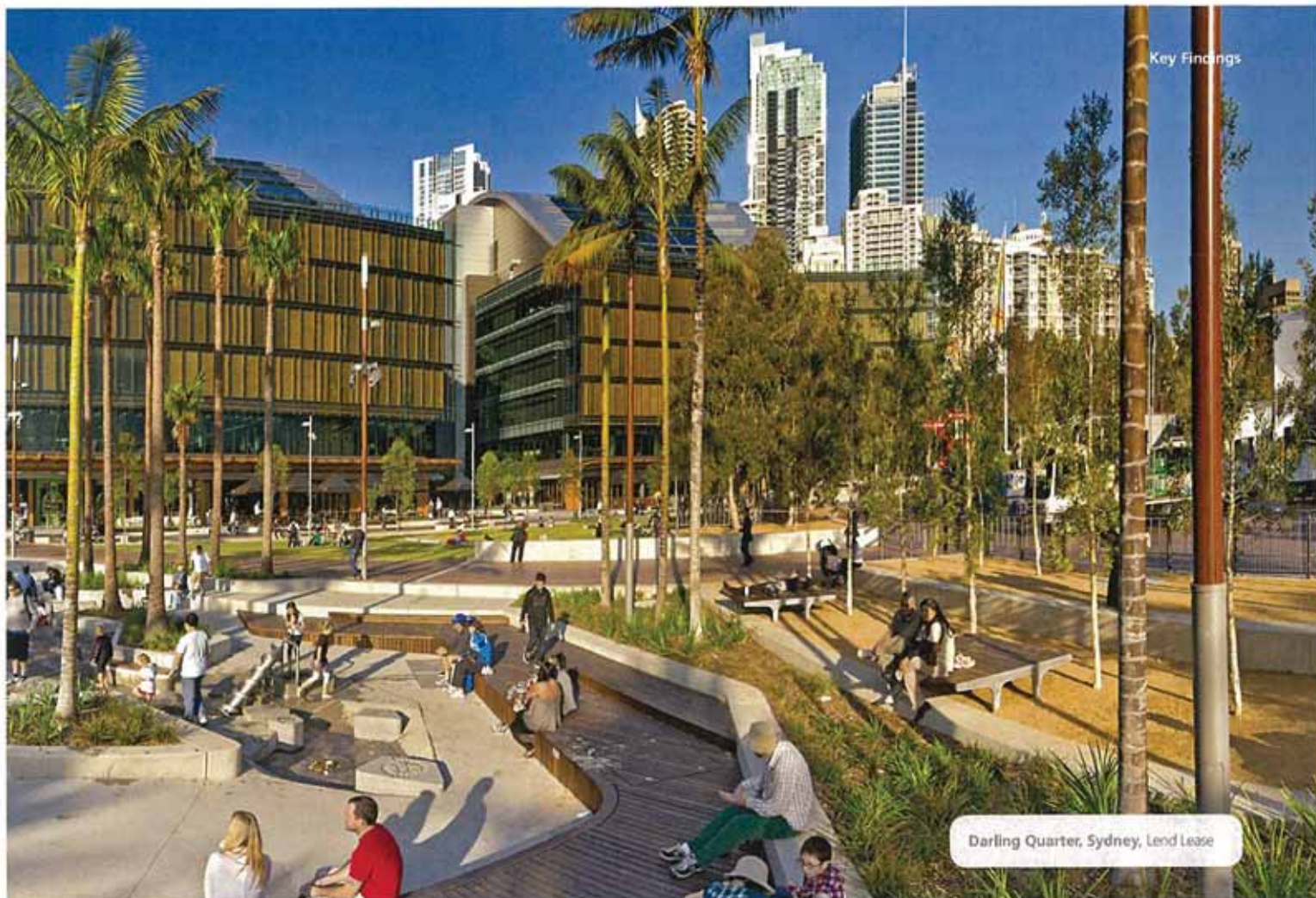
Summary of evidence

Indoor Air Quality: The health and productivity benefits of good indoor air quality (IAQ) are well established. This can be indicated by low concentrations of CO₂ and pollutants, and high ventilation rates. It would be unwise to suggest that the results of individual studies, even meta-analyses, are automatically replicable for any organisation. However, with this important caveat, a comprehensive body of research can be drawn on to suggest that productivity improvements of 8-11% are not uncommon as a result of better air quality.

Thermal comfort: This is very closely related to IAQ, and indeed separating out the benefits is difficult. However, the relationship is clear, with research demonstrating that thermal comfort has a significant impact on workplace satisfaction. Suggesting a general rule about the size of productivity gains is not a robust exercise because of the importance of specific circumstances and the lack of comparability between studies. However, studies consistently show that even modest degrees of personal control over thermal comfort can return single digit improvements in productivity. The importance of personal control applies to other factors too, including lighting.

Daylighting & lighting: Good lighting is crucial for occupant satisfaction, and our understanding of the health and wellbeing benefits of light is growing all the time. It can be difficult to separate out the benefits of daylight – greater nearer a window, of course – from the benefits of views out of the window. Several studies in the last decade have estimated productivity gains as a result of proximity to windows, with experts now thinking that the views out are probably the more significant factor, particularly where the view offers a connection to nature.

Biophilia: The rise of biophilia, the suggestion that we have an instinctive bond to nature, is a growing theme in the research. A growing scientific understanding of biophilic design, and the positive impact of green space and nature on (particularly) mental health, has implications for those involved in office design and fit-out, developers and urban planners alike.



Darling Quarter, Sydney, Lend Lease

Noise: Being productive in the modern knowledge-based office is practically impossible when noise provides an unwanted distraction. This can be a major cause of dissatisfaction amongst occupants.

Interior layout: Noise distraction relates closely (although by no means solely) to interior layout. There are a whole range of fit-out issues that can have an effect on wellbeing and productivity, including workstation density and configuration of work space, breakout space and social space. These factors influence not just noise but concentration, collaboration, confidentiality and creativity. Many companies instinctively know this and regularly engage in exercises to optimise layout. However, the research that informs this remains less quantifiable and needs to be further developed.

Look & feel: The same could be said about research around office 'look and feel', which is seen as superficial by some, and yet should be taken seriously as having a potential impact on wellbeing and mindset – both for occupier and visiting clients. Look and feel (and interior layout), being highly subjective, is something which is likely to be experienced differently by people of different age, gender and culture.

Active design & exercise: A guaranteed route to improved health is exercise. This can be encouraged by active design within the building, and access to services and amenities such as gyms, bicycle storage and green space, some of which may be inside the office building or office grounds, or in the local vicinity. There is not a huge amount of research on the link between exercise and office-based productivity, although that which does exist suggests a lower number of sick days for those who cycle to work.

Amenities & location: The local availability of amenities and services are increasingly recognised in research as being important for occupiers. Childcare in particular can be the difference between working and not working on a given day, and in the relatively few studies that have tried to quantify it, the financial impact for employers has been significant.

Key Findings: Health, Wellbeing, Productivity and the Business Case



We may need to move beyond green, to sustainable buildings.

Healthy, productive...green?

The evidence summarised above (covered in more detail in the full report), spans a large range of factors associated with an office's physical environment. It has suggested a strong causal relationship between design and occupant health, wellbeing and productivity, without so far mentioning 'green building'.

There are reputable, robust studies that suggest the green design features of buildings lead to healthier, more productive occupants. Often, 'green' equates to a feature which enables low carbon or energy efficient operation of the building such as daylighting or natural ventilation. Indeed, in many cases there does seem to be a virtuous circle of good design that works for both people and planet.

However, it is far too simplistic – and potentially damaging – to suggest that low carbon and resource efficient buildings are automatically healthier and more productive for occupants, and we need to be honest about that. There are plenty of win-wins (for people and planet) and there are some tensions. A few of both are highlighted below.

Users in control: Putting trust in the occupier and putting them at the centre of design, including personal control over their indoor environment, can reap rewards in terms of satisfaction, productivity and energy performance. This encourages users to work with the grain of their building and vice versa. There is also evidence that occupants are more forgiving and willing to work in a greater range of temperatures in a 'green building'.

Maximising daylight: This is not without challenges (solar gain, glare etc) but daylight has the potential to provide the necessary light levels for a productive, stimulating environment, while reducing reliance on electric lighting. This just cannot be done in offices with a very deep floor plate, which is a challenge to the status quo in many markets. However, electricity use for some lighting is inevitable, and further innovations in low carbon lighting design will be crucial.

Passive design...up to a point: Where the benefits of fresh air and good thermal comfort can be provided by natural ventilation and passive design (or mixed mode systems), there is a clear win-win for occupier and energy use. In many regions of the world, there is probably scope for passive techniques to be used more frequently than at present. However, we have to recognise that in some climates, high outside temperature (both in the day and at night) and humidity simply make some conditioning of air inevitable.



1 Silo, Cape Town, Anup/Michael Groenewald
& Allan Gray

There are insights to be gained from this analysis, particularly in respect of lighting, air quality and thermal comfort:

1. Ongoing product and systems innovation is crucial to both increasing energy efficiency and improving the experience for occupiers. This appears to be happening apace but could be further driven by clients.
2. The real estate sector needs to better engage in the process of grid decarbonisation and community-scale low and zero carbon solutions. This includes the need to embrace appropriate on and near-site renewables, which are becoming more efficient and more cost-effective and yet are still viewed by some in the industry as undesirable or a diversion.

What drives green building – conducive to healthy, productive occupiers – is quite simple:

1. Good design (such as passive solutions, shading, and natural ventilation where possible).
2. Good construction (new technologies, innovation, smart controls).
3. Good behaviour (appropriate clothing, adaptability and engagement with systems).
4. Good location (enabling low carbon commuting and easy access to services and amenities).

Green building is now a truly global movement, and, partly through the use of green building rating tools, is helping to drive change in markets all around the world, increasing demand for low carbon, resource-efficient building products and services. However, it could be argued that green building professionals and advocates – i.e. we, ourselves – have not been as attentive to the needs of building occupants as we should have. Symptomatic is the development of most green building rating tools, which started with environmental impacts (energy, water, waste etc) and have incorporated more socio-economic measures in due course – but perhaps not quickly enough.

This complex relationship between health, wellbeing, productivity and 'green building' points to a need to reinterpret – some might say rescue – the term 'green' from an association purely with the environmental movement; or we may need to move 'beyond green' to talk much more about sustainable buildings. Either way, the goal should be buildings that maximise benefits for people, and leave the planet better off as well. Low carbon, resource efficient, healthy and productive - really what we are talking about is higher quality buildings.

Key Findings: Health, Wellbeing, Productivity and the Business Case



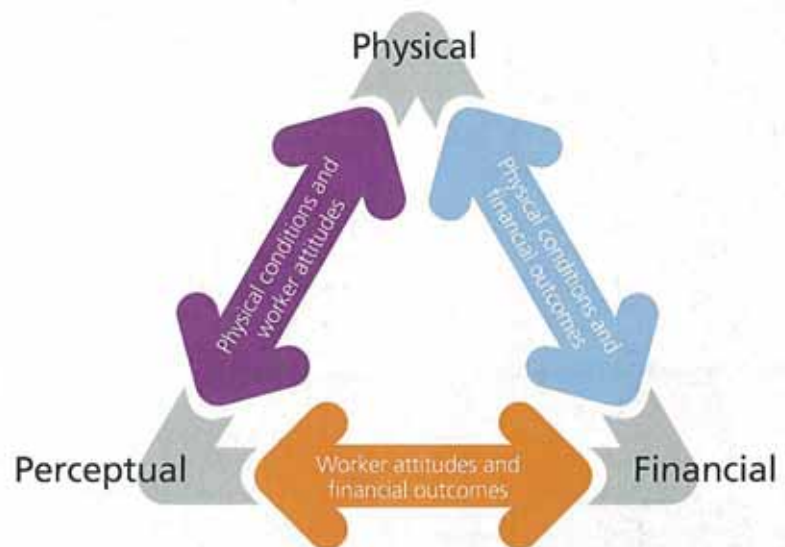
Measuring impact: a framework for assessing health, wellbeing and productivity

There is an important difference between showing how things are related and showing how things are relevant. The question that really matters to most executives is this: How does *my* building impact *my* people?

We have proposed a way for office owners and occupiers to directly engage with this agenda, using a simple framework for measuring organisational or financial 'outcomes', perceptions of the workforce and the physical features of the office itself. As the diagram suggests, it is the relationship between these three elements that is of most interest.

A key objective in developing the framework is to set in place a process which encourages more data collection by more businesses in more common ways.

Summary of metrics framework and key relationships





Bournville Place, Birmingham, Cundall

Financial (or organisational)

1. Absenteeism: Number of days (or hours) of absence due to illness annually.
2. Staff turnover/retention: Percentage of regular, full time employees leaving employment in a given year.
3. Revenue breakdown: Revenue per division/department/team, per building/building zone, and/or per employee.
4. Medical costs: Expenses associated with providing medical insurance or medical care to employees annually.
5. Medical complaints: Incidents of reported/documentated medical complaints resulting from the physical work environment or work activity.
6. Physical complaints: Number and type of complaints of physical discomfort associated with the work environment (e.g. temperature, glare, noise).

Perceptual

The financial or organisational metrics above are concerned with measuring objective indicators. What they can miss are important underlying attitudes about the workplace that can be harder to quantify but can have significant impacts on human performance.

An effective perception study tests a range of self-reported attitudes to gain insight into health, wellbeing and productivity in the workplace. The answers that workers provide can contain a wealth of information for improving office performance.

Physical

To test the premise that the physical design and operation of your office affects the health, wellbeing and productivity of office workers, you need to gather information about the physical office environment itself.

Some of this can be done with very direct measures (illuminance, pollutants or temperature for example), others are more a case of evaluation (views outside or quality of amenities, perhaps). The extent to which this can be done 'in-house' or requires external expert support varies and is changing as new tools come to the market.

One of the most exciting developments in this area is portable and wearable technology. This has the power to measure physical conditions and human impacts in real time. At the time of this study they are just beginning to go mainstream. It looks likely that these devices will substantially expand our understanding.



Key Findings: Health, Wellbeing, Productivity and the Business Case

Rawstorne Place, London,
Bennetts Associates/Clare Park

In the next few years will we start to see the rise of the Chief Wellbeing Officer?

Practical applications and the business case

We believe that plenty of relevant data already exists, but organisations need to implement more systematic collection for that data to be useful. In particular, the data tends not to be thought about in terms of place – i.e. it is often not gathered on an office-by-office basis.

In fact, many organisations are sitting on a treasure trove of information that, with a little sifting, could yield important immediate improvement strategies for their two biggest expenses – people and places, and the relationship between the two.

This is less difficult than it seems. It requires a different way of thinking and working rather than a great deal of extra, expensive data capture. Facilities managers, for example, are likely to have a wealth of data about the building itself, its physical features and even some outcome metrics – such as physical complaints. Likewise, HR departments are already in possession, in many cases, of data about worker attitudes as well as performance data – absenteeism, medical costs, retention, etc. And, of course, the CFO or finance director will be well aware of revenue and related financial metrics.

The sweet spot in this agenda is where the circles on buildings (FM), people (HR) and finance (CFO) overlap, and yet so few businesses take advantage of this rich space. This represents a huge missed opportunity.

If we better understand the relationship between the office, people and organisational performance, the potential for practical application is significant. This includes due diligence on new space, rent review on existing space, fit-out guidance on refurbished space, and so on. A better understanding of how buildings impact people should drive improvements in the workspace, which may be one of the most important business decisions to be made.



At the start of this key findings report, we highlighted the importance of staff costs for a typical business. Through our research process, it became clear that there was no 'magic formula' for 'proving' the business case. What we have done is demonstrate quite clearly the physical office environment (and indeed its location) has an impact on the health, wellbeing and productivity of staff. We have also shown that there are tools available to help make this as relevant as possible for individual organisations.

It is down to those individual organisations, and their advisors, to apply these findings to their own circumstances. That means considering your own operating costs, and the impact that small improvements in productivity would have across the organisation as a whole. Think again about the diagram on page 2. What is the financial value of even a single-digit improvement in productivity, or a small reduction in absences in your organisation, compared to savings on energy costs or even rent?

There is clearly an opportunity for organisations to begin to think differently and use their physical premises for competitive gain. This is true from investors right through to occupiers, whether companies are trying to command a higher price for a high-performing building or looking to take the kind of space needed to help drive business success. The method we suggest could be used, in part or in whole, by all kinds of actors in the industry who want to understand the issue better and get the best from their buildings.

Finally, what role for the sustainability executive? They should perhaps have the keenest interest of all. The forward-thinking sustainability professional could be viewed as having a role in helping to get all three sets of actors above to start thinking and working together. There is even an argument for suggesting health, wellbeing and productivity should be synonymous with sustainability. In the next few years will we start to see the rise of the Chief Wellbeing Officer?

Surely, in the long-term, those who do not engage with this agenda will suffer as a result. Those companies who take seriously their employee health, wellbeing and productivity, will prosper.



More information

Footnotes

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Acknowledgements

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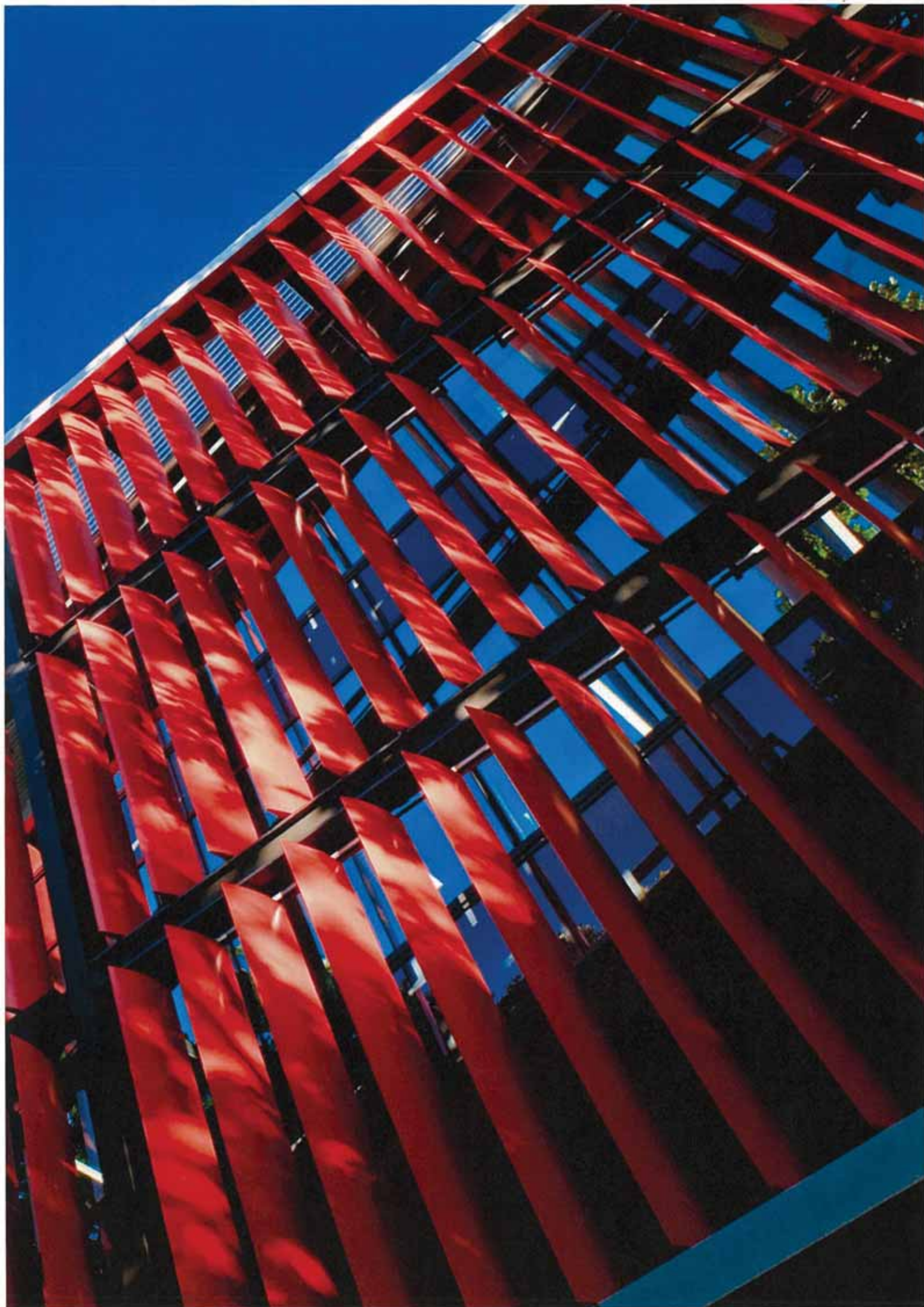
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Editor's note

Towards the end of this project we heard the very sad news of the sudden death of Paul Hinkin, MD of Black Architecture, whose 'viewpoint' piece is included in the report. Paul was a passionate advocate for sustainable design and the wellbeing agenda, and will be missed tremendously by those who knew him. This report is dedicated to him.

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The World Green Building Council connects a global coalition of more than 100 national Green Building Councils and their 27,000 member companies with a single mission: to transform the building industry and ensure our buildings and cities are healthy, efficient, productive and sustainable.

www.worldgbc.org

Partner GBCs





The Value of Green Star:

**A Decade of Environmental Benefits
Research Key Findings**

May 2013





Executive Summary

Since the launch of the Green Star rating system in 2003, hundreds of buildings around the country have been independently certified for their sustainable design and construction using Green Star rating tools.

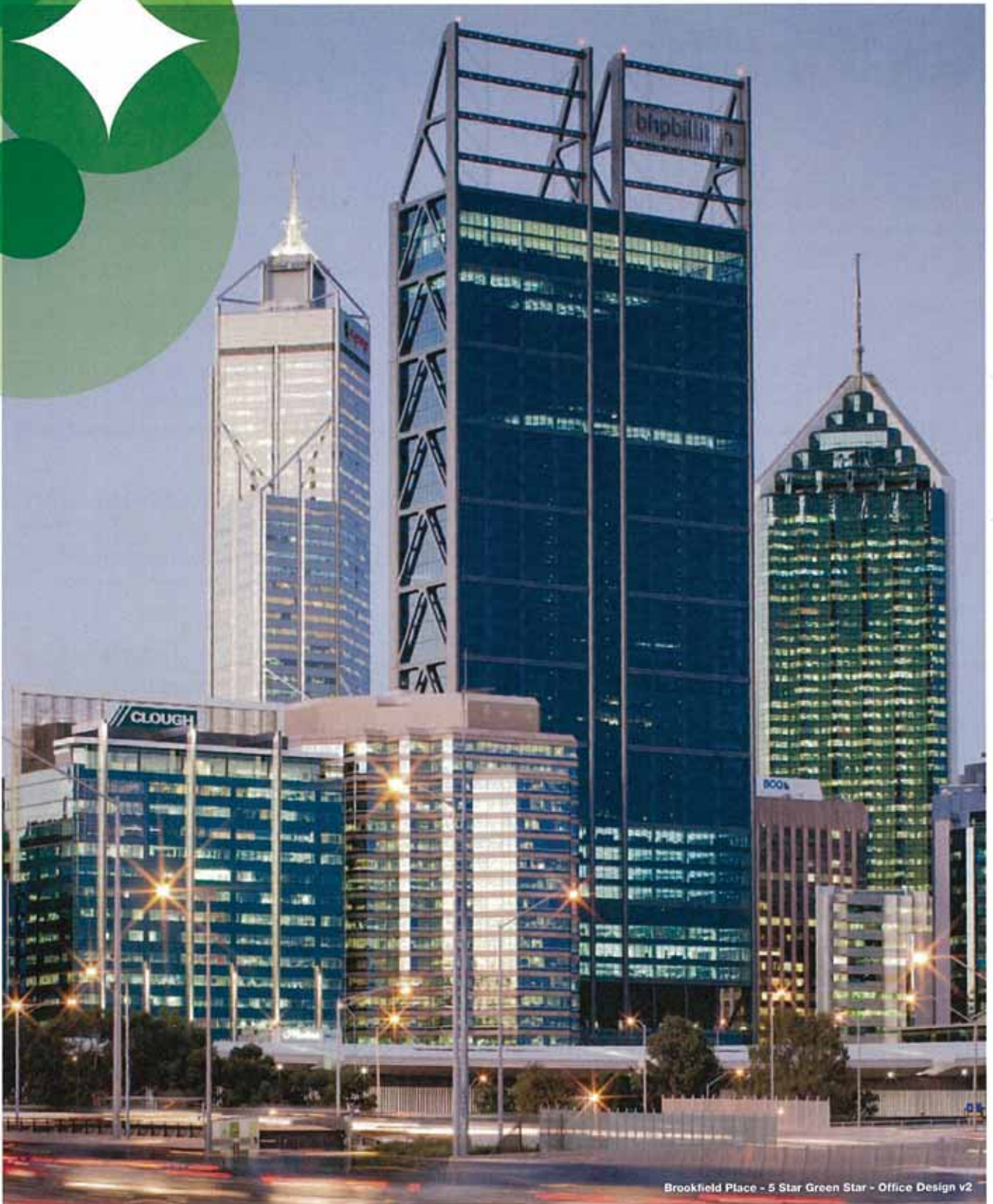
While much evidence of the positive effect of Green Star at the individual building level has been collected over the past ten years, until now, no comprehensive quantitative research has ever been conducted into the overall impact of Green Star on Australia's built environment.

In late 2012, the Green Building Council of Australia (GBCA) conducted a study of data from Green Star-certified buildings in order to quantify the overall impact of the rating system on greenhouse gas emissions, operational energy usage, operational water consumption and construction and demolition waste.

The study compared data from 428 certified project submissions with standard or minimum practice benchmarks. The methodology and findings have been peer-reviewed for accuracy by independent consulting firm Net Balance.

A summary of the key findings of the study are provided overleaf. The research is ongoing, with aggregated results to be published annually.

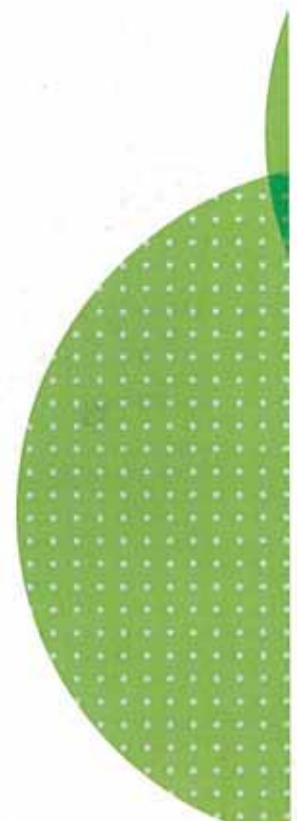
For more information on research methodology and to download the full Green Star: A Decade of Environmental Benefits research report, please visit: www.gbca.org.au and go to the Resources section.



Brookfield Place - 5 Star Green Star - Office Design v2

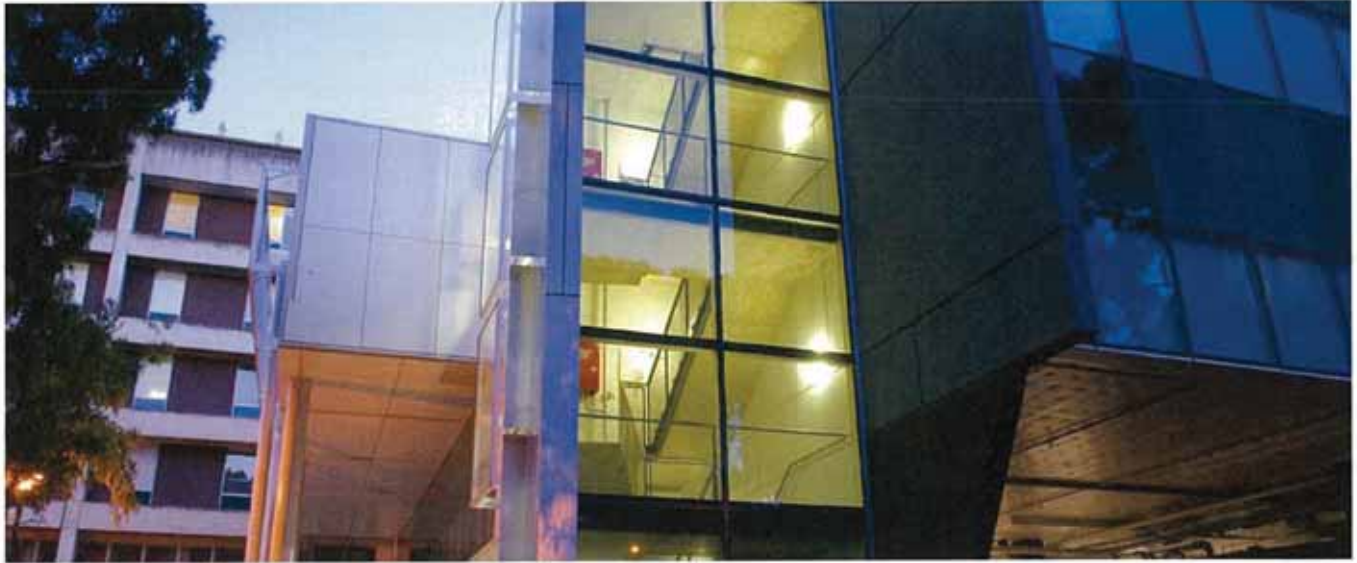
Key Findings

- On average, Green Star-certified buildings produce **62% fewer greenhouse gas emissions** than average Australian buildings.
- On average, Green Star-certified buildings produce **45% fewer greenhouse gas emissions** than if they had been built to meet minimum industry requirements.
- On average, Green Star-certified buildings use **66% less electricity** than average Australian buildings.
- On average, Green Star-certified buildings use **50% less electricity** than if they had been built to meet minimum industry requirements.
- On average, Green Star-certified buildings use **51% less potable water** than if they had been built to meet minimum industry requirements.
- The cumulative savings in greenhouse gas emissions from Green Star-certified buildings equates to **172,000 cars removed from our roads**, when compared to average Australian buildings – that is 625,000 tonnes CO₂ per annum.
- Green Star-certified buildings save enough potable water to fill **1,320 Olympic swimming pools every year** – that is, over 3,300,000 kL per annum.
- On average, Green Star As Built-certified buildings **recycled 96% of their construction and demolition waste**.
- Since Green Star's introduction to the market in 2003, more than **5.5 million square metres of building area have been Green Star-certified**.
- Green Star-certified buildings **save the equivalent of 76,000 average households' electricity use annually**.
- 37,600 truckloads of construction and demolition waste has been diverted from landfill** due to good waste management practices when constructing Green Star-certified buildings.
- The higher the Green Star-certified rating of a building (4, 5 or 6 star) the greater the environmental savings** across all key areas – greenhouse gas emissions, energy use, water consumption, and construction and demolition waste.





Building a sustainable future



FLINDERS MEDICAL CENTRE – NEW SOUTH WING

IMAGE

Flinders Medical Centre – New South Wing
5 Star Green Star - Healthcare Design &
As Built v1 Certified rating

PROJECT DATA

Owner

SA Health

Location

Flinders Drive, Bedford Park
Adelaide, South Australia

Size

A four level extension to existing hospital,
adding 4,374m² of extra gross floor area
and 37 maternal health beds

Cost

\$29 million

PROJECT TEAM

Architect and Interior Design

Woodhead

Engineering Services and ESD

AECOM

Structural and Civil Engineering

Aurecon

Builder

Boulderstone

Client

Department of Transport, Energy and
Infrastructure

The project at a glance:

- ▶ 5 Star Green Star – Healthcare v1 rating
- ▶ First health facility in Australia to achieve certification under the Green Star - Healthcare v1 rating tool
- ▶ Compared to an equivalent benchmark building, energy consumption is 42 per cent less, energy costs are \$400,000 less and water consumption is 20 per cent less
- ▶ Site wide CO₂ emissions reduced by 4,160 tonnes equivalent to taking 810 cars off the road for an entire year.

green building council australia



Healthcare As Built v1 2012

green building council australia



Healthcare Design v1 2011

Babies born at the New South Wing extension of Flinders Medical Centre (FMC) are getting a 'green' start in life.

The new extension, rated 5 Star Green Star – Healthcare v1, houses FMC's women's health services and has been designed to deliver high quality patient care with a minimal environmental footprint. The New South Wing provides 12 birthing and delivery rooms and flexibility to expand FMC's post-natal capacity by 31 inpatient beds, giving even more women the chance to deliver in a healthier, green environment.

According to Frank Zotti, Redevelopment Project Manager for FMC, the new facility has proved to be extremely popular since being commissioned in late 2009. "We've delivered 253 more babies in the new unit this year (2010/11), a nine per cent increase on the previous year," he says. The numbers are positive proof of the community's support for hospitals that provide high-quality care for patients and the environment, with improved patient recovery rates.

Environmental features in the facility include a 286 panel solar hot water system, a displacement air-conditioning system that allows individual temperature control in patients' rooms, and specified low-volatile organic compound (VOC) paints, adhesives and floor coverings for the entire project. Together with access to external views and a design which provides good levels of natural light, the extension offers a light-filled, airy and stress-reducing hospital environment for patients and staff alike.

Speaking at the opening of the new facility, South Australian Health Minister, John Hill, said that "New South Wing's designers have risen to the challenge and built a terrific facility which places patients and the environment front and centre."

Kriston Symons, project team leader for AECOM, says it just seemed 'common sense' for the project to focus on both health and environmental outcomes.

"There is a large amount of evidence showing that patient recovery rates improve when you provide high levels of Indoor Environment Quality (IEQ) such as access to natural light," he says.

A range of studies support the idea that green hospitals are good for the environment and good for patients. A study at the Mackenzie Health Sciences Centre in Canada, for instance, found that depressed patients in sunny rooms recovered 15 per cent faster than those in darker rooms. Another study at Bronson Methodist Hospital in Michigan linked green design principles such as improved ventilation, natural light and a connection to nature with an 11 per cent reduction in secondary infections and a decrease in nursing turnover rates.

"Many of the initiatives you see in New South Wing are good practice and should be incorporated into healthcare projects as a matter of course, starting with passive design principles of building orientation, form, shading and insulation," Symons argues.

Energy simulations performed during the design predicted a 43 per cent energy saving against a benchmark building. The actual performance of the New South Wing has shown strong correlation with the energy simulation, with the New South Wing being 42 per cent more efficient than the overall hospital benchmark.

The overwhelmingly positive community and staff response to the new Green Star-certified facility has also given Frank Zotti confidence that other benefits such as increased staff retention, staff productivity and improved patient recovery rates will be realised over time. "Ultimately, we chose Green Star because it provides official recognition, and allowed our achievements to be independently assessed and benchmarked."

For other teams considering Green Star, Zotti offers some straight-forward advice: "The rewards are worth the effort."



WHAT THE AUSGRID LEARNING CENTRE ACHIEVED:

MANAGEMENT

A sustainable procurement guide was developed by the project team to help Flinders Medical Centre make smart and sustainable purchasing decisions, and also earned the project a credit under the Management category. SA Health has since used the guide on other health projects, ensuring that the sustainability lessons learnt at New South Wing are spread across the state.

INDOOR ENVIRONMENT QUALITY (IEQ)

New South Wing was awarded IEQ credits for a range of features, including low-VOC paints, adhesives and sealants, external views and access to natural light, as well as independent temperature control of patient rooms.

"Our philosophy was to minimise the environmental footprint of the project and create a healthy environment for patients, visitors and staff," Kriston Symons explains. "With this in mind, the extensive evidence connecting good IEQ to faster recovery rates and improved staff and patient health made IEQ credits a natural focus for the project."

The attention to clean air and good IEQ has paid off with more women than ever before choosing to deliver at the facility. Since the new wing opened, births at FMC have risen to 3,012 in 2010-2011 (up from 2,761 in 2008-2009), an increase of almost 10 per cent, suggesting faster recovery times and strong community support for FMC's green and healthy vision.

ENERGY

A 286 panel solar hot water system was installed to provide hot water across the entire FMC campus. This earned the New South Wing credits under the Energy category and has helped reduce energy costs by \$400,000 per year.

Other energy-saving measures include a zoned air-conditioning system that delivers cooling and heating directly to where it is needed using the energy-efficient Shaw Method. Developed in Australia, the method decouples humidity and temperature loads to prevent overcooling and subsequent reheating which occurs in conventional air-conditioning systems, halving energy consumption.

A concurrent upgrade of the central plant to serve the New South Wing saw the installation of a new, energy-efficient central cooling plant, which resulted in no net increase in carbon emissions from the construction of the new building. Overall, site-wide CO₂ emissions have been reduced by approximately 4,160 tonnes, equivalent to taking 810 cars off the road for a whole year.

WATER

South Australia's long standing drought made minimising water use a priority. By installing extensive rainwater harvesting that provides water for urinals and toilets, as well as a water-efficient heat rejection system, FMC has reduced water consumption by an estimated 20 per cent in the new wing.





Bowden Development

Green Star / Green Star Projects / Green Building Case Studies

FRI 18 SEP 2015



Green Star Case Study

“Inspiring excellence in urban built form, Bowden mandates 5 Star Green Star benchmarks for all buildings. Not only does this increase home values, it also gives Bowden residents the opportunity to greatly reduce their power and water bills and enjoy a healthier place to live.”

- Alicia Davidge, Bowden Project Director, Renewal SA

Renewal SA's Bowden Development, situated on the western edge of the Adelaide City Parklands, is redefining sustainable living in South Australia. Each and every building delivered on the 16.3 hectare site must achieve a 5 Star Green Star rating – or above. Renewal SA has raised the bar even higher, by also committing to achieve a Green Star – Communities rating for the entire precinct.

Sustainable places for people

From offices through to retail outlets and residential developments, all buildings at Bowden must meet 5 Star Green Star 'Australian Excellence' sustainability benchmarks.

Rivegum Homes' Terraces on Sixth, comprising three stunning six-storey terraces, is just one inspiring example. The first terraces in Australia to receive a 5 Star Green Star rating were designed to be energy-efficient. North-facing orientation, cross-ventilation and high-performance glazing control heat gain and loss, while maximising natural light.

According to Rivegum Homes' General Manager – Property, Robert Alvaro, "each terrace comes with a raft of sustainability features we believe go beyond what's considered to be the norm."

All water fixtures and fittings were selected to minimise water consumption, and are complemented by 2,050-litre rainwater tanks installed in the grounds of each dwelling. A third pipe system provides recycled water to all toilets. A 1.5kW solar photovoltaic panel system generates renewable energy for each dwelling.

The unique façade is constructed with recycled bricks and lets in natural light while still maintaining visual privacy and blockage from excess sunlight.

Each dwelling has general waste bins and glass, plastic and recycling bins, along with a composting 'Bokashi Bin'.

"We wanted to ensure that what we did was environmentally friendly while, at the same time, enhancing the comfort levels for occupants," Robert says.

Working with the Green Star framework "demanded a fundamental shift in thinking from the traditional approach, not to mention the acquisition of new and greener skills among our designers," Robert adds.

“It's most gratifying to know that we are now firmly set in our commitment to a greener present and future.”



Green Star rising

56 Seventh Street, also three storey terraces, has a spaciousness rarely found in modern apartments. The lavish chef's kitchens, high ceilings, quality fixtures and fittings and large outdoor living areas may be clear for buyers to see. Less obvious, however, are the impressive sustainability features, including quality insulation, high-performance LED lighting and energy-efficient appliances which all contribute to a coveted 5 Star Green Star rating.

"I'm a big fan of sustainable and efficient buildings – and Green Star gave us a method to objectively measure our achievements," says Tim Schaefer, Director of Aodev, the building's developer.

"Working within the Green Star framework also forced us to look at the project through a sustainability lens from the outset – and encouraged us to seek sustainable alternatives that we may not have otherwise considered," Tim says.

These included "off-the-scale" thermal insulation that Tim says "no one had done before in Adelaide", as well as recycled concrete that cost less and used 20 per cent less Portland cement thus reducing the environmental impact of the building materials.

The first project at Bowden to register for a Green Star rating, 56 Seven Street was also the first to sell out.

More than mere buildings

Building at Bowden isn't just a matter of bricks and mortar. Renewal SA is creating a community that protects the natural environment, that is built for resilience, and that has people at its heart.

The feeling of community extends beyond the front door and ties the residents of Bowden together. The unique approach to streetscape includes meeting places where residents and visitors alike can stop for a chat, curbside streets where people on foot and bike take priority, and parks with BBQs, water features and games to play. These are just some of the attributes you'll find at Bowden.

Tania Rover, a new resident, is sold on the community. "What I've really loved is that they're trying to build this community. We've had wine and cheese nights to get to know each other, and the little touches like the free community library are great."

Working towards a Green Star – Communities rating. Bowden is currently being assessed against nine categories: governance, design excellence, environmental sustainability, economic prosperity, liveability and innovation.

"Meeting Green Star benchmarks is about more than achieving environmental sustainability – although this is important. It's also about creating a vibrant, affordable, resilient and healthy place for people," says the GBCA's Chief Executive Officer, Romilly Madew.

Once the rating is achieved, the people of Bowden will have independent proof that their community is environmentally, economically and socially sustainable.

"The community will really benefit from the initiatives that Green Star – Communities brings to Bowden. The ease of access to public transport and the streets designed for people, the coordinated urban and building designs reviewed by an independent Bowden Design Review panel, and the many community development programs – all these contribute to making Bowden a unique and highly desirable place to live," says Bowden's Project Director Alicia Davidge.

Getting around

Passenger vehicles generate 7.5 per cent of Australia's greenhouse gas emissions. Green Star rewards developments that reduce the environmental impact of transportation through an integrated transport plan, by reducing the number of parking spaces allocated, and by encouraging the use of public transport and alternatives to single car commuting.

Bowden has developed a transport and parking strategy for its Green Star – Communities rating, but it's already easy to live in Bowden without owning a car. Residents live just 2.5 kilometres from the CBD. The tram ride into town takes less than half an hour, and the train is even quicker. Bowden's pedestrian and cycle paths encourage healthy, active living, and bikes can be borrowed for free from one of the local cafes. Self-service access to shared cars is also available through GoGet.

As Bowden resident Barbara Brown says:

“One of the highlights for us is being able to use the public transport. We rarely use the car now, which is great.”



Employment brings energy

Sustainable communities are prosperous communities that build a strong and resilient local labour force with a diverse range of businesses.

At Bowden there's a state-of-the-art gym, cafes and restaurants, an authentic pub, well-stocked deli and a vintage shop. An artist-run, not-for-profit space is a magnet for locals working in the arts. Nearby, a photographic studio, art gallery and co-working space have been converted from a bare warehouse, and are now popular with some of Adelaide's elite artists.

A dance studio runs regular classes, circus workshops reach out to at-risk youth, and a cyclists collective gets together weekly to work on their bikes.

The Sunday Organic & Sustainable market has become a staple as people flock to sample the super fresh fruit, vegetables, coffee and the odd hemp shirt.

"Renewal SA has a highly-successful training and employment program which mandates that developers support the local community to gain work through job placements and work experience. On average, each contract includes two to four work experience placements and one to three jobs," Davidge explains.

Bowden's mantra is "it's the people that make the place", and as Renewal SA's vision takes shape, South Australia has a spectacular, sustainable place for people.

The Bowden development is owned by Renewal SA. For more information visit <http://lifemoreinteresting.com.au/>

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Adelaide's newest office gets the Green Star tick of approval

News / GBCA news

WED 26 AUG 2015

Australia's first building to achieve a Green Star – Design & As Built Design Review now has an early opportunity to promote its sustainability credentials, while the project team has insights to share with the industry.



Paul Davy, dsquared Consulting, gives his perspective on the benefits of Green Star – Design & As Built

Adelaide's newest office, 185 Pine Street in the thriving Hindmarsh Square Precinct, ticks all the boxes for A Grade buildings.

Designed using computer simulation modelling, the building's design is energy- and water-efficient and provides a high performance working environment without relying on complex technologies or over-complicated façade treatments.

This dynamic new design has also gained another tick of approval, after achieving Australia's first Green Star – Design & As Built optional Design Review.

Registering a project for Green Star – Design & As Built is a commitment to certify a completed building. However, the voluntary Design Review gives projects the confidence they are on the right track and provides an early opportunity to promote a building's Green Star promise.

A marketing must

According to Paul Davy, Director of dsquared and the ESD consultant on the project, the developer, Palumbo, was keen for Green Star to be a central pillar of its marketing campaign for new tenants.

"Early discussions with the Green Star team determined that the assessment timeline for the project would be significantly shorter if we registered for Design & As Built over Office v3," says Paul.

This suited Palumbo's design and marketing program, as "certifying the design using Office v3 would have occurred at least six months later – far too late to have provided any marketing benefit," Paul explains.

Palumbo is expecting the Green Star rating will translate into a broader tenancy base, particularly from interstate companies with high expectations of sustainable office space. Outgoings will be lower and the operating expenditure is expected to be more favourable, with a fast payback period on the sustainability features delivering a quality asset.

Fast and efficient certification

Paul was impressed with the Green Star team's commitment to fast and efficient certification, and says communication throughout the process was excellent.

"As this was our first project using the new rating tool we had a number of queries, including a couple of Credit Interpretation Requests that were responded to very quickly and in a very constructive manner. We felt that the relationship worked very much like a partnership," he says.

dsquared is now applying Design & As Built to a diverse range of building projects, including an adaptive re-use of an industrial building which will transform it into a new marketplace, a brand spanning university campus building, and perhaps most exciting of all, a new medical retrieval helicopter base.

"The new rating tool, which provides a much more holistic approach to the environmental impact of buildings than the legacy rating tools, has proven to be readily usable on many different building types," Paul explains.



Cost-effective certification

The GBCA always aimed to deliver a streamlined, holistic approach to design and rating of buildings with Green Star – Design & As Built. So, have we achieved it?

"Definitely," is Paul's response.

"Green Star – Design & As Built provides a much more holistic approach to rating, particularly if the modelled and performance options are followed. The 'tick-box' approaches common in the legacy rating tools have largely been removed. The submission process has been significantly streamlined allowing a design-stage certified result to be achieved six months earlier than using a legacy rating tool," Paul adds.

In fact, Paul says there was "no cost impost" in moving to the new rating tool.

"It's actually been a bit cheaper. Certification fees are significantly down, and as we are able to spend less time preparing a submission, we can keep our consultancy fees down too," Paul says.

Hints and tips for project teams

Paul has a few hints and tips for other project teams embarking on a Green Star – Design & As Built rating.

"Green Star Design & As Built recognises the results of good design, so start by focussing on the key outcomes required – energy efficiency, water efficiency, low carbon transport, and low carbon construction techniques – and the rating tool will recognise the results achieved," Paul explains.

Paul notes that, while there are many similarities between the new rating tool and its predecessors, "Green Star – Design & As Built works quite differently, so teams should carefully read the guidelines provided by the GBCA to understand the differences."

A key variance is found in submission templates, which replace cover sheets and short reports. "These need to be completed and submitted exactly in the template format – they can't be modified as they are the key pieces of documentation that Green Star assessors will review," Paul warns.

In fact, the new tiered approach to assessment means that the templates may be the only documents that are assessed, so Paul's tip is to "make sure that they are clear and comprehensively completed".

"For Design Review certification, the design documentation needs only be at DA stage quality, rather than 100 per cent tender quality as required with the legacy rating tools. This is where the significant savings in time and effort come into play. It is now possible for teams to submit for Design Review at the DA stage, and achieve their Design Review certification in time for leasing/marketing."

And 185 Pine Street certainly provides this point.

To find out more about leasing space in 185 Pine Street, please contact:

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Wollongong City Council Administration Building

Green Star / Green Star Projects / Green Building Case Studies

TUE 24 MAR 2015



“Achieving a Green Star – Performance rating is about more than financial sustainability – although this is essential. It’s also about ensuring that we have an efficient building that will consume less water and electricity, reduce the waste it generates and emissions it releases and also provide an enjoyable and healthy workplace for our staff.”

- Wollongong City Lord Mayor Councillor Gordon Bradbery OAM

Wollongong City Council’s Administration Building is positive proof that older buildings can be green buildings. First occupied in 1987, the building is the first in Australia to achieve a 5 Star Green Star – Performance rating, signifying ‘Australian Excellence’.



The rating provides the people of Wollongong with independent verification that their building stacks up against some of the newest green icons around the country – and that they have an efficient, productive and healthy community asset.

Local government leader

Local governments have a unique role to play in influencing building decisions made in their communities. Leading councils recognise they have a responsibility to invest in assets that meet the needs of their communities not just today, but for decades to come, and they are turning to the Green Star rating system to help them.

“We’ve demonstrated to the local industry and to the community that you can gain a 5 Star Green Star rating with an ageing building if you use the right methods and programs,” says Lord Mayor Gordon Bradbery.

“We have shown that this pathway to sustainability could be used by other local governments or government agencies. We have also shown that we can gain a rating comparable to brand spanking new buildings that are purpose-designed to achieve 5 or 6 Star Green Star ratings.”

Council is now developing a Sustainable Building Strategy which will guide how it improves the operational sustainability of existing buildings, in addition to how new buildings will be designed, constructed and operated. The experience gained in retrofitting the Administration Building, along with improving its management practices, will greatly assist Council in developing the strategy.

"We have set a high benchmark – one that is independently verified – and we are proud to be leading Australia with respect to the sustainable operation of buildings," Cr Bradbery says.

Benchmarking brilliance

While Council had implemented programs to improve the operational efficiency and sustainability of its highest-consuming assets, the diversity of the asset portfolio, the varied occupancy and associated operational requirements made benchmarking a challenge.

Dr Carl Hopley, a member of Wollongong City Council's building and facility management team that specialises in building sustainability upgrades, says that Council was "unable to access any tools with the flexibility to address the unique operational characteristics of our buildings. This meant we had to benchmark assets against themselves with a view to achieving continued improvement.

"But the question was always the same: how do our buildings perform against others? Green Star – Performance has helped us answer this. We are now able to validate the success of the implemented efficiency measures, and also gauge the benefits from the management procedures and practices followed in the building.

"It was great to see that our leadership with regards to cleaning practices and the requirement for cleaners to hold green cleaning qualifications was recognised, with the GBCA awarding an Innovation point," Carl adds.

Upgrade for uplift

Over the past decade, building manager David Peterson has implemented a range of energy and water upgrades, including the installation of custom-made rainwater harvesting tanks with a capacity of 70 kilolitres, sensor-controlled dual flush toilets, low water consumption urinals and low flow taps for office amenities.

Sensor taps have been installed in public areas, fire test water capture and reuse has been implemented, along with extensive sub-metering and power factor correction. The team has also integrated a heat pump hot water system, a new heating, ventilation and air-conditioning system, heat reflective blinds and lighting upgrades. Energy and water analysis completed while undertaking the Green Star – Performance process indicates that these initiatives have reduced energy consumption by 54.6% and water consumption by 85%.

In addition to the physical upgrades, David and Carl have implemented a range of management practices – from the HVAC maintenance procedures through to the requirement that cleaning staff have qualifications in green cleaning.

An illuminating experience

Before undertaking the Green Star – Performance rating, Council believed "we had implemented all of the cost-effective energy-saving opportunities, with other options, such as double glazing retrofits and voltage optimisation, looking costly and with little payback," Carl says.

But a lighting review undertaken found that the lighting distribution was inconsistent across the building and floor plates.

"There are sections of the building which are completely over-lit – and we're now undertaking a full lighting redesign and retrofit. We are exploring options such as the inclusion of smart lighting systems which will adjust light outputs to meet the required level. This review and subsequent upgrade presents a new opportunity with good financial and environmental returns," Carl explains.

Participation in the Green Star – Performance PILOT also assisted the building manager and the building monitoring and control system (BMCS) supplier to identify additional energy efficiency opportunities. Carl notes "that the additional BMCS capabilities have the potential to reduce electricity consumption by a further 10-12 per cent according to estimates provided by Schneider Electric."

"We think these two actions are the last big energy saving opportunities we can make on the Administration Building – and we discovered these opportunities through using the Green Star – Performance rating tool. It's now all about squeezing the last bit of viable juice from the lemon. To this extent, we remain committed to the ongoing tuning of the building and looking for more opportunities to reduce the building's consumption as new technologies come online," Carl concludes.

For more information on this project including score and category achievements visit our [project directory](#).

