

City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Submitted via email to: eemp@cityofsydney.nsw.gov.au

8 May 2015

Dear Sir / Madam,

RE: CITY OF SYDNEY DRAFT ENERGY EFFICIENCY MASTER PLAN

Thank you for the opportunity to provide comment on the Draft *City of Sydney Energy Efficiency Master Plan Improving Energy Productivity 2015-2030 (Master Plan)*. The Green Building Council of Australia (GBCA) commends the City of Sydney (City) on the *Master Plan* that outlines measures which could reduce greenhouse gas emissions in the City by 33 per cent by 2030, compared to 2006 levels. 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 City is currently undertaking in energy efficiency, in particular the work of the *Better Buildings Partnership (BBP)*, *Smart Green Apartments* program, *Residential Apartments Sector Sustainability* working group and *CitySwitch*. The GBCA is pleased to support these initiatives and to assist in any way we can to help them meet their objectives.

As part of a considered planning approach, it will be important to integrate the eventual *Master Plan* with the other recently released City plans, including the overarching *Sustainable Sydney 2030*. We note that the *Master Plan* identifies that the City will work with all levels of government and key stakeholders to ensure that a number of current initiatives are either maintained or extended and that a number of the strategies identified have come directly from the *NSW Energy Efficiency Action Plan*. This demonstrates the collaboration that is required to achieve such ambitious targets.

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 City has an opportunity to lead the way by certifying iconic council buildings (as has been demonstrated with Gunyama Park and Green Square Aquatic Centre), which will assist in achieving the goals identified in the *Master Plan*. As stated above, the GBCA understands that it is not just the City that can lead by example and take responsibility; industry must also lead the way. The GBCA would like to work closely with the City to identify opportunities to work collaboratively to achieve the objectives of the *Master Plan* across a number of sectors.

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 councils can meet community expectations and demonstrate long-term fiscal responsibility and accountability for the buildings they own, occupy and develop.

About the GBCA

As you are aware, 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 the 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 (such as behaviour change, green procurement and waste management) through such initiatives as CitySwitch.

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 over 850 projects having now achieved Green Star certification across Australia.

The Green Star rating system is designed to take an 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.

Green Star – Design & As Built

In October 2014, the GBCA launched Green Star – Design & As Built into the Australian market. 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. The GBCA congratulates the City on registering the Gunyama Park and Aquatic Centre for Green Star certification under this rating tool. 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 building's 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 standard-practice building. Such reductions are directly related to reduced greenhouse gas emission, lower overall energy demand as well as reductions 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.

Sydney's Darling Quarter achieved a 6 Star Green Star – Office Design v2 rating and a 6 Star Green Star – Office As Built v3 rating representing 'World Leadership'. The Darling Quarter project embodied a new era of sustainable development and through the Green Star ratings achieved was able to transform a forgotten corner of the CBD into a thriving mixed-

use development. Please find enclosed a copy of the Darling Quarter 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 rewards the implementation of processes and strategies that support positive sustainability outcomes during construction. The 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 GPT Group Head Office Fitout achieved a 6 Star Green Star – Office Interiors rating representing 'World Leadership' in 2012. This achievement has become a symbol of the organisations approach to business and has delivered a significant boost to GPT's brand. Please find enclosed a copy of the GPT case study for further information.

Green Star – Performance

Green Star – Performance assesses the operational performance of existing buildings across nine 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 *Master Plan*, 80 per cent of greenhouse gas emissions generated within the City come from energy consumed in buildings. This statistic demonstrates the opportunities that exist for Green Star – Performance not only for the City-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 building's 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.

Wollongong City Council owns the first project to achieve a 5 Star Green Star – Performance rating representing 'Australian Excellence' 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 a 5 Star Green Star rating with an ageing building if you use the right methods and programs. Please find

enclosed a copy of the Wollongong Council Administration Building case study for further information.

In 2012, 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 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.

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. Environmental Upgrade Agreements (EUAs), that the City currently offers are one such innovative, cost-effective and uniform mechanism to ensure building owners have access to the finance they require and will help to ensure that the City's existing building stock has an opportunity to be upgraded above minimum standards.

Working collaboratively

The BBP represents more than half of the City's CBD commercial floor space. The 2013-14 annual report identified that BBP members had reduced their emissions by 35 per cent since 2006, placing them halfway to the 70 per cent emissions reduction target by 2030. Members of the BPP have improved the sustainability performance of their buildings through measures such as building system upgrades and installing infrastructure such as tri-generation and recycled water networks.

The GBCA looks forward to continuing its support of the BBP and in particular, working collaboratively to identify building owners that would benefit from using Green Star – Performance to assist in achieving the objectives of the BBP.

In March 2015, the Australian Government Department of Industry and Science and the GBCA brought together around 50 industry and government stakeholders, including the City, 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 a report which provides an overview of the current situation in this sector will be made available by the end of May 2015 and the GBCA looks forward to working with the City on a range of actions to improve the mid-tier commercial office buildings sector.

While new buildings only make up a small percentage of total building stock in the Sydney CBD each year, the GBCA is keen to work with the City to find ways to encourage new buildings and fitouts to go beyond minimum standards and deliver buildings and tenancies that meet best practice benchmarks or higher. While the market has proven that Green Star-certified buildings achieve better returns and lower vacancy rates, the GBCA looks forward

to working with the City to consider ways in which going beyond minimum practice and achieving Green Star certification can be encouraged and rewarded.

The GBCA commends the work the City has undertaken on the *Master Plan*. The City of Sydney demonstrates great leadership in sustainability through its work on developing policies and guidelines such as this *Master Plan*, supporting and encouraging sustainable development within the City and also through its valued membership of the GBCA. Please do not hesitate to contact me, or Luke Farr, Advocacy Coordinator – Local Government 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, appearing to read 'Robin Mellon', with a horizontal line underneath.

Robin Mellon
Chief Operating Officer
robin.mellon@gbca.org.au



Darling Quarter

Green Star / Green Star Projects / Green Building Case Studies

WED 21 NOV 2012



Sydney's Darling Quarter embodies a new era of sustainable development. As the designer and developer of Darling Quarter, Lend Lease has leveraged the Green Star knowledge gained from its work on more than 50 Green Star certified projects to transform a forgotten corner of the CBD into a thriving mixed-use development, with the 6 Star Green Star – Office Design v2 and 6 Star Green Star – Office As Built v3-certified Commonwealth Bank Place as its striking centrepiece.

In a demonstration of how valued green building is becoming, Lend Lease's Australian Chief Executive, Mark Menhinnitt, explains how collaboration between the property sector, government, and corporate Australia has resulted in the delivery of this 'World Leadership' sustainable project.

Through a shared vision, Australian Prime Property Fund (APPF) Commercial, Lend Lease, the Commonwealth Bank of Australia, and the Sydney Harbour Foreshore Authority have added 58,000 square metres of Green Star-rated office space to the city, in addition to 3,000 square metres of retail area, a popular illuminated children's playground with water features, youth theatre, interactive digital facade and community green.

"Lend Lease has transformed a previously under-utilised fringe CBD site into a dynamic destination for Sydney-siders and the broader community to enjoy, with access to valuable public amenities and iconic new spaces that will leave a powerful legacy for future generations," says Menhinnitt.

From the very beginning, Green Star sustainability was the goal towards which all Darling Quarter stakeholders agreed to strive, and Green Star has added value to all involved by providing a recognised set of benchmarks and a method of measurement to underpin the design and delivery of the project, and increasing the value and demand for sustainable building assets in general.

"Achieving high environmental ratings reduces exposure to commercial risk and asset obsolescence by ensuring assets are 'future-ready'. Without the ability to benchmark the sustainability performance of a new development, the value proposition for investment into sustainable practices is less attractive. Green Star has allowed us to articulate the sustainable performance of developments like Darling Quarter in a concise and transparent manner. This in turn, allows stakeholders to be confident that the finished building is of the highest possible environmental standards," says John Dillon, Fund Manager of APPF Commercial, the owner of Darling Quarter.

Jennifer Saiz, Head of Group Property for the Commonwealth Bank couldn't be happier with the bank's new Green Star-certified headquarters, and says that the high-quality internal environment at Commonwealth Bank Place has supported her organisation's transition to healthier and more efficient ways of working.

"It's has been great to be able to provide a workplace that reinforces Commonwealth Bank's

commitment to our people, innovation and sustainability. Implementing activity-based working at Commonwealth Bank not only enhances our people's ability to deliver great outcomes for our customers, but it is also a more sustainable way of working that reduces our impact on the environment and supports greater work life balance," she says. "Our move to Commonwealth Bank Place has not only reduced our carbon footprint, but has also improved collaboration and productivity in our teams."

What Darling Quarter Achieved

MANAGEMENT

Darling Quarter was awarded a Green Star 'Innovation' point after the project became the first to achieve a 6 Star Green Star – Office As Built certification under version 3 of the rating tool; after securing a 6 Star Green Star – As Built v3 rating under version 2, the project team upgraded the As Built target rating to 6 Star Green Star under version 3. The decision was risky, as construction had already commenced, but worthwhile according to Cate Harris, Head of Sustainability at Lend Lease Australia.

"We considered that a version 3 rating would recognise the additional steps that we had already taken in the design phase to 'future-proof' the building, and would serve as a clear sign to the wider market that a 6 Star Green Star – As Built v3 rating could be achieved on a large-scale building," she says. "As a result, Darling Quarter is the first building to achieve such a rating in Australia."

ENERGY

Energy-efficient lighting and air conditioning, onsite energy production via tri-generation and extensive building tuning, have combined to ensure Commonwealth Bank Place produces 40 per cent fewer greenhouse gas emissions than a comparable 5 Star NABERS Energy-rated building. This equates to a 72 per cent reduction in greenhouse gas emissions when compared to a typical non-Green Star-rated office building in Australia.

Now that the building is fully occupied, Lend Lease notes that the energy consumption for some uses, such as vertical transportation, is even lower than the original modelling anticipated. Lend Lease attributes this to the large floor plates of the building, coupled with the building's occupancy by a single tenant and the interconnecting stairs which have reduced reliance on lifts. "The high-performance façade is also providing a significant benefit in minimising the energy consumption associated with the air conditioning systems," says Harris.

WATER

The implementation of rainwater harvesting and onsite recycling systems at Darling Quarter will result in a 92 per cent reduction in annual potable water consumption - 52 million litres of water annually. This equates to more than 20 Olympic-sized swimming pools each year. Onsite blackwater treatment facilities are designed to treat and recycle 100 per cent of blackwater generated by Commonwealth Bank Place, and treats additional effluent from mains systems through sewer mining.

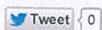
Designed by Veolia Water Solutions and Technologies, the blackwater system at Darling Quarter uses a dual fixed-film biological treatment process, involving a moving bed biofilm reactor (MBBR) in combination with a membrane bio reactor (MBR).

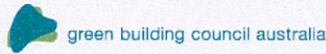
"As a means of future-proofing the development, it was important to increase the levels of water efficiency as much as possible," says Jean-Christophe Schrotter, Technology & Innovation Manager at Veolia Water Solutions and Technologies. "The water systems at Commonwealth Bank Place improve upon the technological and efficiency achievements realised by any product or system on the market to date and will hedge the Commonwealth Bank of Australia against projected spikes in the price of water in the near future."

MATERIALS

The close relationship between Lend Lease, APPF Commercial and the Commonwealth Bank of Australia enabled a fully integrated fitout to be delivered in tandem with the base building works. "This allowed for the base building to be adapted prior to construction to satisfy tenant requirements and design aspirations. The integrated approach prevented significant amounts of material wastage that would normally occur in a traditional construction with a separate fitout," Harris explains.

Harris believes that delivering Green Star-certified assets is becoming easier for developers, as the choice of 'sustainable' materials is increasingly synonymous with the selection of 'quality' materials. In the case of Darling Quarter, many of the materials required to meet the architectural and aesthetic aspirations of the development were directly aligned with those needed to achieve Green Star 'Materials' and 'IEQ' credit benchmarks. "An example of this is Darling Quarter's façade, which was required for design purposes to have a very high visible light transparency (VLT). The high VLT of the façade allowed us to gain Green Star sustainability benefits through daylight availability to building occupants."





The GPT Group Head Office Fitout

Green Star / Green Star Projects / Green Building Case Studies

WED 21 NOV 2012



When Australian property company The GPT Group (GPT) made the decision to upgrade its head office space in Sydney's MLC Centre, the conversation quickly turned to how a Green Star refurbishment could help transform the Group's operating model and reinvigorate the GPT brand.

Achieving 6 Star Green Star – Office Interiors v1.1 certification in July 2012, the project has pushed the envelope of sustainable fitouts through the delivery of an exceptionally sustainable 'World Leadership' workspace, all within a building that is more than 30 years-old.

The new fitout, which spans floors 50-52 of one of Sydney's most iconic office towers, represented a challenging project, not only for its location within the upper-reaches of a CBD skyscraper, but for the ambitious structural changes that were required to the base building itself.

Architect Harry Seidler originally designed the MLC Centre between 1972 and 1975; it opened in 1978 and was awarded the coveted Sir John Sulman medal in 1983. Fitout architect Woods Bagot, has introduced modern inter-floor workplace connectivity to GPT's new office via a sweeping central staircase, which required major reconfiguration of each floor plate, and the building's façade was also altered in order to effect visual and environmental improvements.

At first glance, airy open-plan common areas and picture-postcard windows make the GPT office more reminiscent of a trendy inner city café or club than commercial office space. However, the layout and design features are as sustainable and functional as they are aesthetically appealing.

The GPT project team has combined the effective use of innovative design, technology and organisation-wide behavioural change to consolidate and reduce the size of the GPT tenancy from five floors to three, and create a showcase of GPT's Green Star expertise and industry leadership.

The Green Star-certified office has become a symbol of the organisation's approach to business and has delivered a significant boost to GPT's brand. Since the achievement of its 'World Leadership' certification, GPT has been recognised with accolades for the office and business alike, including three NSW Government Green Globe Awards across the 'Energy Efficiency', 'Business Sustainability' and 'Built Environment Sustainability' categories. GPT has also been named the world's most sustainable real estate company for 2012/13 by the Dow Jones Sustainability Index.

What GPT Achieved

Materials

The efficient use of sustainable materials was a core tenet of the GPT fitout design brief, resulting in full points scored for many of the Green Star 'Materials' category credits. Adhering to the philosophy of 'everything old is new again', the project team repurposed and reintegrated

many items from the old fitout into the new space. In fact, the project was awarded Green Star 'Innovation' points for achieving an incredible 96 per cent waste diversion rate, exceeding the highest Green Star benchmark by 16 per cent.

Some of the ways that 'waste' products were reintegrated into the fitout include the recycling of timber wall panelling from the old office to create new joinery, and the reintroduction of much of the old office furniture after a simple upholstery refresh.

In other examples of creative material reuse, old floorboards from the halls of Kempsey High School on the NSW Mid North Coast now form a point of interest as wall panelling in the office's reception area, while Coca-Cola bottles have been given a second life as a component of the Emeco Navy 111 chairs used in the kitchen.

GPT entered into product stewardship agreements with all suppliers, ensuring that fitout items have a low environmental impact— now, and at the end of their useful life. "Through careful management and selection of materials we have been able to dramatically reduce our total carbon footprint. Not that long ago this would have been difficult to achieve but the number of sustainable suppliers has increased exponentially. A world of suppliers has sprung up around Green Star," explains GPT National Sustainability Manager, Bruce Precious.

Management

GPT staff members no longer have dedicated desks, instead embracing the benefits of activity-based working. In combination with dematerialisation, this new work model has allowed GPT to reduce individual desk spaces by 17 per cent. "We've saved space through clever design and, despite the increased density, people feel they have more space, not less," explains one GPT worker.

In a testament to the benefits of 6 Star Green Star fitouts, the first employee self-assessment post-occupancy study for the office – conducted three months after the move – found that employees felt 15 per cent more productive in the new space.

Bruce Precious explains that while initially there was some resistance to change, particularly with the implementation of activity-based working, engagement initiatives such as the 'work environment passport' have made for a smooth transition into the new green office. Under the passport scheme, employees were rewarded for showing their understanding of different aspects of change. The passport has helped increase the understanding and uptake of new office technology with wireless computing, soft phones and a 'swipe-to-print' system reducing paper consumption at the office by more than 70 per cent. Further, GPT has reduced onsite paper storage by an incredible 90 per cent – from 900 lineal metres down to 90.

Energy

Huge efficiencies have been gained at GPT with the installation of suspended T5 lights, LED downlights and desk lamps. Energy-efficient fittings, combined with lower overall artificial light provision and the installation of motion sensors, have cut the amount of energy used for lighting within the GPT tenancy by 70 per cent, with overall energy bills halved.


IEQ

ESD consultants Arup completed a comprehensive survey to determine the effectiveness of existing air conditioning which then informed the engineering and implementation of new systems. To boost the air change and energy efficiency of the base building's dual active chilled beam and variable air volume (VAV) systems, the project team introduced supplementary air conditioning for meeting rooms and installed louvres within the façade to increase the levels of fresh outside air. Optimising air conditioning efficiency has helped to achieve significant reductions in energy use across the tenancy, with air change efficiency now 50 per cent higher than Australian standard requirements.

In line with aims of the Green Star 'IEQ' category, a significant boost to indoor environment quality has been achieved through the specification of sustainable low-VOC furniture, carpets and soft furnishings and the introduction of more than 500 plants to further improve air quality for GPT workers. As a result, occupant comfort has increased significantly, with the latest post occupancy study showing a massive jump in GPT employees' comfort and satisfaction in their new workplace. Prior to the move, GPT workers rated their overall comfort with aspects of the space including temperature, ventilation and acoustics at 54 per cent, while in the new space the overall comfort ratings have jumped up to 97 per cent.

"I find the control I have over the environment as a user of the space is fabulous – being able to move around and chase the sunshine around the building, or adjust the lighting and air as I need it is great," said one GPT worker.

Another GPT employee sums up the sense of pride the people at GPT feel for their new workplace. "I'm proud to say I work in a green environment," the employee said. "Achieving the 6 Star Green Star rating was a wonderful acknowledgement of the importance we place on sustainability. I've never worked in an environment that feels this open, fresh and healthy, while also providing me with all the facilities I need to be productive and effective in my role."

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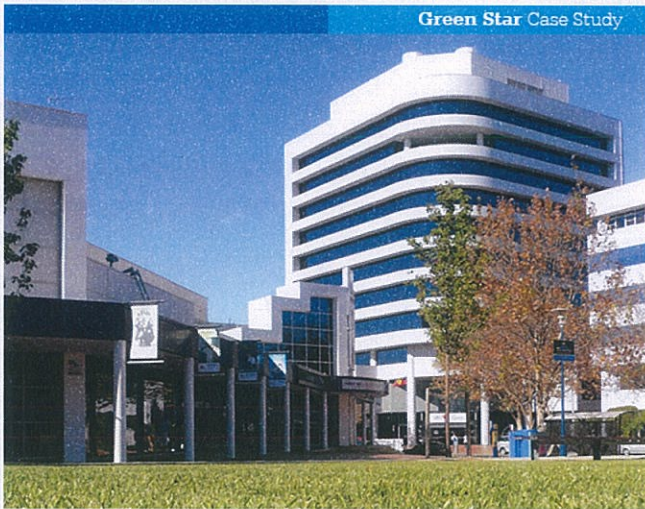
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Wollongong City Council Administration Building

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.

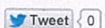
But a lighting review undertaken found that the lighting distribution was inconsistent across the building and floor plates.

"There are sections of the building which are completely over-lit – and we're now undertaking a full lighting redesign and refit. 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](#).





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.

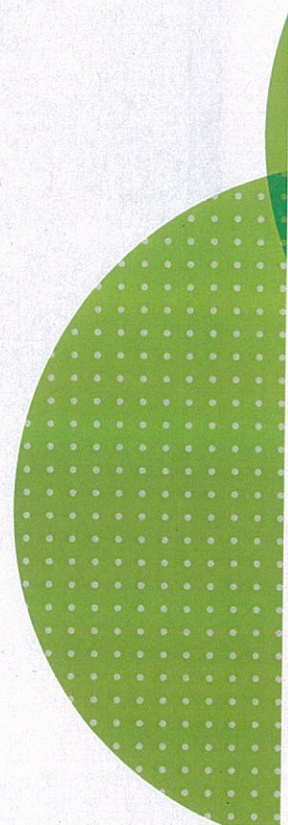
For more information on research methodology and to download the full Green Star: A Decade of Environmental Benefits research report, please visit: www.gbca.org.au and go to the Resources section.



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

