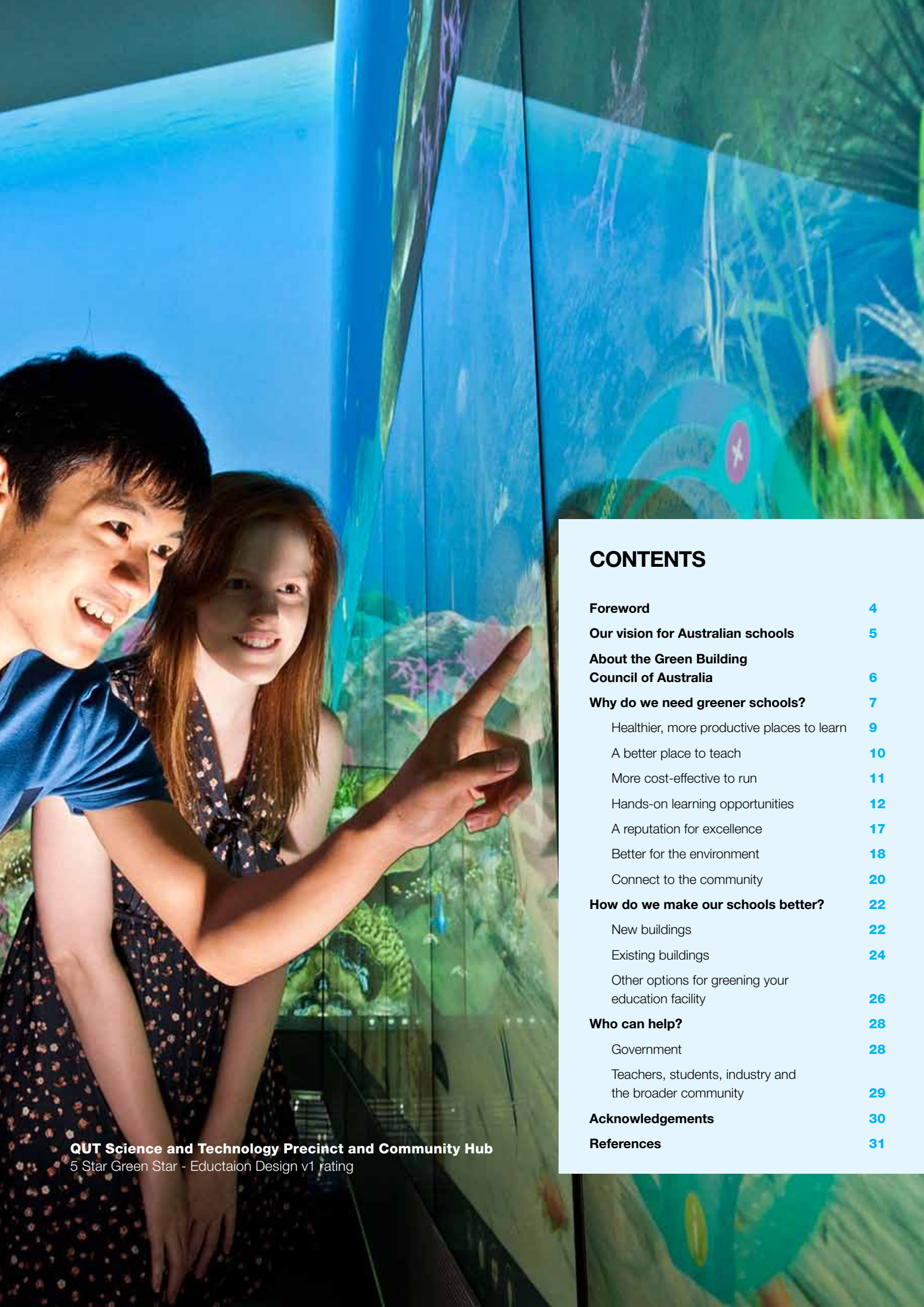
Building a sustainable future

The future of Australian education – Sustainable places for learning

green building council australia

greenstar



QUT Science and Technology Precinct and Community Hub
5 Star Green Star - Eductaion Design v1 rating

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Foreword

Around Australia, companies are recognising that buildings with good natural light, fresh air and views of the outdoors can boost the satisfaction, health and productivity of employees.

Many employers are reporting significant increases in productivity and worker retention, decreases in absenteeism and large reductions in operational costs after their move to a Green Star building.

So, if we know that office space that provides light and fresh air improves performance, why are we satisfied for our children to learn in school environments that are too cold in winter, too hot in summer, badly lit and poorly ventilated?

We simply cannot afford to risk the health and education of Australia's next generation – and we should no longer accept school buildings that are below best practice. Not when we consider that the classroom environment can affect a child's academic progress over the course of a year by as much as 25 per cent and can have as much of an impact on a child's learning as their teacher.

To maximise the opportunities of the Asian century, we must ensure our students, from primary to tertiary levels, are performing at their peak potential. Improving the performance of our schools will improve learning outcomes – which in turn will boost Australia's future productivity and international competitiveness.

Developing world-class tertiary institutions will attract students from around the world, as well as engaging and educating the next generation of environmentally-aware Australians.

A quality education is not just about the teachers, the text books or the curriculum. While these are all essential, so too is the quality of the buildings in which we learn; a consideration that has been missing from the school funding policy debate.

We believe it is possible for every education facility in Australia to provide a healthy place for students and staff to learn and work. The GBCA needs industry and education stakeholders to work with us to establish an Australian Centre for Green Schools that will provide people with the information they need to create the places our students deserve.

We hope that *The future of Australian education – Sustainable places for learning* sparks a new conversation about how high-performance green schools can deliver high-performance students.

Romilly Madew

Chief Executive
Green Building Council of Australia

Our vision for Australian schools

Our vision for the future of Australian education is one in which all students and teachers have access to sustainable places for learning, and all students and teachers can reap the benefits of happier and healthier education facilities.

We hope that *The future of Australian education – Sustainable places for learning* will provide students, teachers and administrators from primary to tertiary levels, as well as government, industry and the broader community, with information about why we need greener schools, how we can make our schools better, and what people can do to help.

About the Green Building Council of Australia

Established in 2002 as a member-based organisation, the Green Building Council of Australia (GBCA) is the nation's authority on sustainable buildings and communities. Our mission is to accelerate the transformation of Australia's built environment into one that is healthy, liveable, productive, resilient and sustainable.

What we do

Rate

through Australia's only national, voluntary, holistic rating system for sustainable buildings and communities – Green Star.

Educate

people on how to design and deliver sustainable outcomes for our buildings and communities.

Advocate

policies and programs that support our mission and work with industry and government to achieve these goals.

Wesley House
5 Star Green Star - Office Design & As Built v2 rating

Why do we need greener schools?

Green schools are healthier, more productive places to learn

Across Australia, most of our 9,500 schools and many of our tertiary institutions have been built to meet only minimum building code requirements. The result is facilities that are not necessarily designed to provide comfortable, productive or healthy work environments for students and teachers.

But what would it look like if all schools were designed and built to provide students and teachers with the healthiest, most productive place to learn and work? What would it mean if all of our existing education facilities were operated at their optimal sustainable potential?

Students that attend schools with healthy air to breathe and conditions that encourage learning are happier, healthier and perform better academically. Teachers that work in schools where they have control over the indoor environment and access to natural light are happier and get sick less often. Students and teachers enjoy learning and working in green schools because:

- access to daylight and views enhances performance
- high indoor air quality improves health and concentration
- excellent acoustics boost learning potential
- comfortable indoor temperatures increase occupant satisfaction.

There is a large body of research linking health and productivity with sustainable building design attributes such as high levels of indoor air quality and control over aspects of the work environment. Studies from across the globe have consistently demonstrated the correlation between better building design and increased occupant wellbeing and productivity.[1]

In 2013, the University of Salford and Nightingale Architects in the UK released a study on the effects of classroom design on students' learning outcomes. The study is the first holistic assessment to successfully link the overall impact of school building design to learning outcomes. The study found that the classroom environment can affect a child's academic progress over a year by as much as 25 per cent.[2]

> "I think people are quite proud of the fact that our school is going to set a precedent for other buildings into the future."

Helen Gourley
Principal, Kingston High School, Tasmania

Another significant study has found that green schools and universities in the United States deliver:

- a 41.5 per cent improvement in the health of students and teachers, including reduced incidences of asthma, flu, respiratory problems and headaches
- up to 15 per cent improvement in student learning and productivity
- up to 25 per cent improvement on test scores due to good lighting and ventilation.[3]

The Heschong Mahone Daylighting Study of more than 21,000 students in the US state of California showed a dramatic correlation between day-lit school environments and student performance. The students with the best access to daylight demonstrated:

- a 20 per cent faster progression in mathematics
- a 26 per cent faster progression in reading
- as well as an increased performance of 5-10 per cent when they had window views.[4]

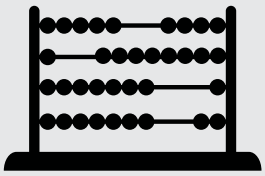
In fact, a 2010 study performed in controlled laboratory conditions conclusively demonstrated that children deprived of natural light for a five day school week had disrupted melatonin cycles. The research concluded that such disruptions were likely to have a significant impact on students' alertness during school.[5]

According to researchers at Lawrence Berkeley National Laboratories, when ventilation rates are at or below minimum standards (roughly 425 litres per minute, per student), an associated decrease of 5 to 10 per cent occurs in certain aspects of student performance tests.[6]

Studies out of the US and New Zealand support the Lawrence Berkeley findings, with a Californian study finding that asthma cases among elementary students were reduced by 65 per cent when the indoor environment quality of the school was improved,[7] and the New Zealand study concluding that a classroom's design had the same influence on student's test scores as their teacher.[8]

These studies show that while it will always be important to invest in **what** we are teaching students and **who** is teaching them, we must also invest in **where** our students are learning. If we want to get the most out of our investment in education and see Australia's students reaching their academic potential, it is vital that we consider the buildings in which they learn.

The Heschong Mahone Daylighting Study found that students in day-lit school environments demonstrated:



20%

faster progression in mathematics

26%

faster progression in reading

5-10%

increase in performance when students also had window views.

Green schools offer a better place to teach

Green schools not only deliver better outcomes for students, they can also significantly improve the health and wellbeing of teachers.

As teachers spend up to 90 per cent of their working day indoors, they benefit from buildings that are designed to provide natural daylight, fresh air and access to external views. The opportunity to make simple adjustments to temperature and lighting settings within the classroom makes a significant difference, with teachers in a 2003 study reporting higher levels of comfort in their classrooms when they had access to simple thermal controls, such as thermostats or operable windows.[9]

Schools are no different to other buildings when it comes to the productivity, health and wellbeing benefits offered up by healthier, more comfortable work environments. Numerous studies have examined the impacts of workplace design on employee health, wellbeing and job satisfaction, and the flow-on benefits that these factors have in terms of increasing employee attraction, retention and productivity, and decreasing absenteeism.

Studies into the estimated cost of replacing an entry to mid-level member of staff range from 50 – 150 per cent of the worker's annual salary, with the percentage increasing further for specialised, high-level employees.

While employment churn in the education sector is rarely measured in the dollar terms of lost productivity, in a sector that is set to lose a significant proportion of its current workforce to retirement alone over the next decade (according to the NSW Department of Education and Communities, 54 per cent of the state's teachers in 2012 were in the 45-and-over age bracket)[10], the need to attract new teachers and retain existing staff is more important than ever.

In 2006, Greening America's Schools: Costs and Benefits did characterise the issue in dollar terms, estimating that teacher retention in green schools translates into financial savings of about $4 per square foot over a 20 year period.[11]

Kingston Education Project
5 Star Green Star - Education Design v1 rating

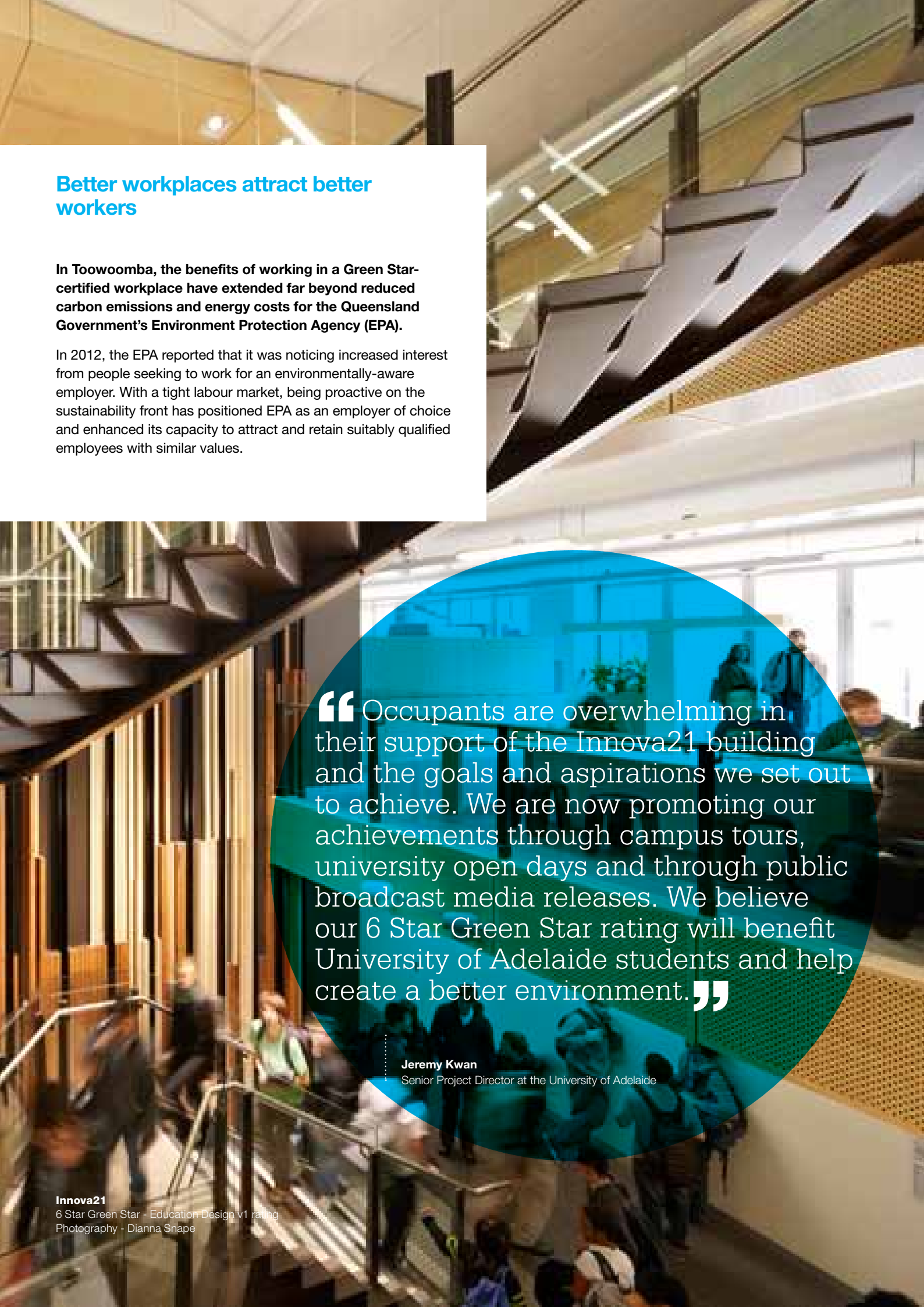
> "Our staff and students are finding [our 5 Star Green Star – Education Design v1 TAFE] a wonderful place to work and learn. It's proof that achieving our sustainability targets has also improved learning conditions"

Dr Peter Whitley
GippsTAFE Chief Executive Officer

Better workplaces attract better workers

In Toowoomba, the benefits of working in a Green Star-certified workplace have extended far beyond reduced carbon emissions and energy costs for the Queensland Government's Environment Protection Agency (EPA).

In 2012, the EPA reported that it was noticing increased interest from people seeking to work for an environmentally-aware employer. With a tight labour market, being proactive on the sustainability front has positioned EPA as an employer of choice and enhanced its capacity to attract and retain suitably qualified employees with similar values.



"Occupants are overwhelming in their support of the Innova21 building and the goals and aspirations we set out to achieve. We are now promoting our achievements through campus tours, university open days and through public broadcast media releases. We believe our 6 Star Green Star rating will benefit University of Adelaide students and help create a better environment."

Jeremy Kwan
Senior Project Director at the University of Adelaide

Innova21
6 Star Green Star - Education Design v1 rating
Photography - Dianna Snape

Green schools are more cost-effective to run

The potential to save money on operating costs is a critical factor in deciding to design, build and operate sustainable buildings, be they offices, warehouses, hospitals or shopping centres. It's no different for education facilities.

In a US survey conducted in 2012, over 75 per cent of respondents for primary, secondary and tertiary education facilities reported that reducing energy use, generating operational savings and improving ten year operating costs were important reasons for their decision to build a greener school.[12] A follow-up study found that a large percentage of respondents had achieved savings from their investment in sustainability, including energy use reductions, annual operational cost savings and ten year cost savings.[13]

In 2013, the GBCA released *The Value of Green Star – A Decade of Environmental Benefits*. This quantitative study of Green Star-certified buildings showed that Green Star-rated education facilities deliver, on average, a 70 per cent reduction in operational energy usage for electricity, a 46 per cent reduction in the use of natural gas and a 35 per cent reduction in potable water consumption when compared with standard buildings.[14]

These findings are supported by research from the United States, which has found that while green schools can cost 1 to 2 per cent more than conventional schools to build, the return on investment was 20 times the additional cost to go green.[15] Efficient lighting, heating and cooling, better insulation, greater use of daylight and natural ventilation, as well as water-saving features, all reduce energy and water consumption and, consequently, utility costs. The same study showed that green schools in the US consume an average of 32 per cent less water and 33 per cent less energy than conventionally designed schools.

Lower energy and water costs, improved teacher retention and reduced health costs save green schools about four times the additional cost of going green. For an average school, building green would save enough money over a 20 year period to pay for an additional full-time teacher, 200 new computers, or 5,000 new textbooks.[16]

Energy saving at The Spot

The University of Melbourne's 5 Star Green Star – Education PILOT certified building, 'The Spot' used 46 per cent less energy in its first year of operation than comparable buildings across the rest of the university. According to the University's Vice-Chancellor, Professor Glyn Davis AC, "the whole building's energy use is considered to be exceptional. Rating our buildings ...helps us to reach our performance targets and makes economic sense, as our green buildings outperform existing buildings by large margins."

In the case of The Spot, outperforming by "large margins" translates to savings of over **$180,000 per annum compared to the average of equivalent buildings on campus**, a saving that more than discounts the 5 per cent premium paid for the building's sustainable features, even before productivity benefits are calculated.

Green schools provide hands-on learning opportunities

Green schools inspire and engage students with environmental issues and act as interactive teaching tools, educating the next generation of sustainable leaders through hands-on learning.

With the global market for environmental products and services estimated to represent $2.74 trillion by 2020[17] providing the students of today with the knowledge and skills they will need in the employment market of tomorrow is as important as ever.

Kimi Ora School in New Zealand provides a great example of hands-on learning, with a number of building attributes functioning as sustainable learning resources for the school's students. These include see-through panels in the walls and ceiling that show the construction works of the building, a digital display screen in the lobby to display information about the building's energy use, and a rainwater collection tank with clear piping and a digital display.

Here in Australia, the Ausgrid Learning Centre in NSW provides a world-class technical training facility for power workers. The 6 Star Green Star-certified Learning Centre features purpose-built training yards and workshops for Ausgrid staff to hone their skills, space for office workers and an Energy Efficiency Centre for the public to learn about the electricity industry.

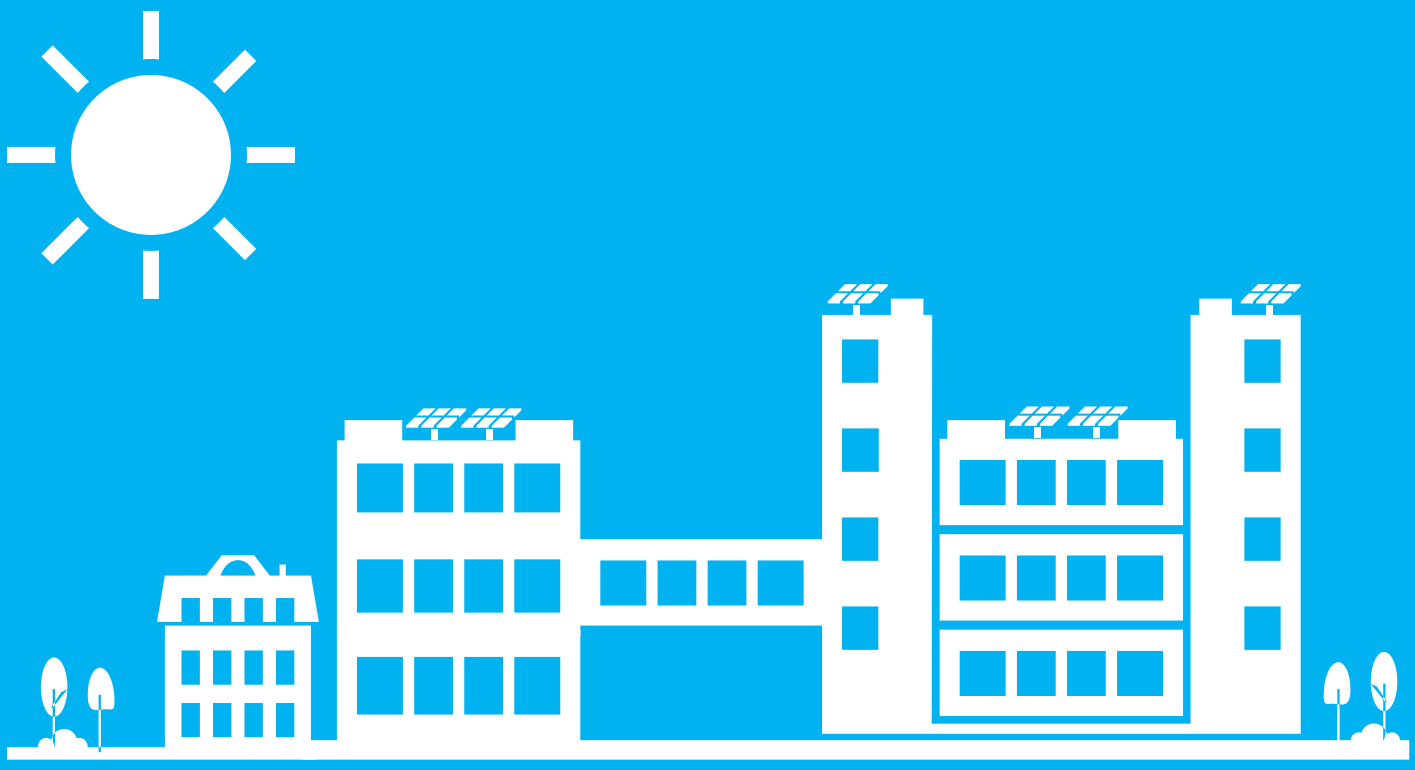
At Williamstown High School in Victoria, the school's sustainable design and construction has created a unique learning setting that is helping students to develop a greater appreciation for their environment and their impact upon it, while in Queensland, Peregian Springs State School attracts students from neighbouring schools who visit to gain a hands-on lesson in sustainability.

Environmental science in action in the ACT

At the ACT's 5 Star Green Star – Education Design v1 rated Harrison School, energy saving initiatives have halved the school's energy consumption when compared with a typical school. Just as important, the school acts as an interactive teaching tool, educating the next generation of sustainable leaders through hands-on learning by engaging students in environmental science from Year 3. As Harrison School's Principal, Dennis Yarrington says, "If we get kids to reduce, reuse, recycle, close a door, put a jumper on, use water sensibly, all those types of habits are the key things that will make a sustainable school retain its value to society."

“We wanted an environmental and sustainable multi-purpose, multi-sensory centre where students could interact with the environment and play undercover with sand and learn about sustainable gardening with the space for propagating and potting plants. It has given students the opportunity to interact with the environment, create sustainable gardens and grow an orchard. They are using technology to measure water usage, power usage, energy consumption and to record how much energy we’re generating through the solar panels.”

Sue Jose
Gold Creek Primary School, ACT on the school’s Environment Centre which achieved a 6 Star Green Star – Education Design v1 rating



Bay View State School
4 Star Green Star - Education Design & As Built v1 rating

Fostering environmental awareness at Bay View State School

Incorporating best practice passive design with an emphasis on natural lighting, cross-ventilation and shading, the 4 Star Green Star – Education Design and As Built v1 certified Bay View State School provides a state-of-the art, healthy and sustainable learning environment for its students.

Water tanks, solar panels and clever design encourage staff and students to use less electricity and water, while interactive meters allow students to observe electricity generation and water use in real time. According to Bay View's Principal, Peter Black, this alone has enhanced students' learning and increased their respect for the environment: "The school's green design is fostering a broader culture of environmental awareness among both students and staff."

Inspired by sustainable school building, the school community has initiated a number of broader environmental activities. A food scrap recycling program has been started by Year 4 students and their teacher to direct food waste away from landfill and into the school's compost bins and worm farms.

Year 3 students are involved in a school Landcare group and have undertaken tree planting at the school to prevent soil erosion, while younger students are enjoying the gardening club which teaches them about sustainable food production. Principal Peter Black explains that the school and supporting curriculum helps "build the knowledge and skills for students to live a more sustainable life."

Creating a green school doesn't stop when the rainwater tanks and the solar panels are installed. Creating a truly sustainable school requires environmental initiatives to be implemented and sustainability principles to be embedded into curricula at every level. Creating a green school is about moulding generations of people to be 'environmentally literate' and understand their impact on, and responsibility to, the environment.

Sustainability has been identified as one of three cross-curriculum priorities of the Australian Curriculum, along with Aboriginal and Torres Strait Islander histories and cultures and Australia's engagement with Asia. The states and territories are responsible for developing and implementing Australian Curriculum syllabuses and ensuring that the cross-curriculum themes are included across all disciplines.

In addition to this, there are a number of organisations, such as the Australian Education for Sustainability Alliance and the Australian Conservation Foundation who work with teachers and educators to improve the accessibility, usability and efficient delivery of sustainability learning across the Australian Curriculum.

There are many initiatives in Australia and around the world that students, teachers and schools can adopt to learn about sustainability in new and fun ways.

> "Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world thr ough action that recognises the relevance and interdependence of environmental, social, cultural and economic considerations."

Australian Curriculum Assessment and Reporting Authority (ACARA)

La Trobe University Shepparton Campus
5 Star Green Star - Education Design v1 rating

Wollongong Green Team goes from trash to maths and beyond

Wollongong City Council on the NSW South Coast has a number of programs aimed at educating schools students and the wider community about the environment.

The council's Green Team Waste Educators deliver a range of waste-focused workshops and activities to schools that focus on a range of factors including recycling, the waste hierarchy, waste audits, composting, worm farming and landfill tours.

The Green Team also runs two competitions each year to raise students' awareness of waste issues. For the Recycling Challenge competition, students design a poster about what can and cannot be placed in the recycling bin and then display the poster publicly. The second competition is called 'From Trash to Maths and Beyond' and encourages schools to conduct their own waste audit, review their results and come up with an action plan for reducing waste to landfill and increasing resource recovery.

The Green Lane Diary makes sustainability fun

The Green Lane Diary is an interactive curriculum-linked education program designed by environmental educators to help raise children's awareness of the challenges our planet faces, and how living more sustainably can make a difference. Supported by a website and iPad magazine, students keep a diary of their sustainable activities over the course of the school term allowing them to see first-hand the impacts of their positive actions. By keeping a record of their activities and discoveries every day, the students gain awareness and help to make their homes, schools and communities more sustainable. The diaries are then judged and the best Green Lane Diary individual and class heroes are recognised by their school, peers and family at a special event. This flexible program aims to allow teachers to tailor the activities to suit their setting.

Reducing impacts, improving health and engaging the community

In the US, the Department of Education has established the Green Ribbon Schools program. The Green Ribbon Schools Award recognises schools that achieve great outcomes in three areas:

- reducing the environmental impacts and costs of waste, water, energy use and transportation
- improving the health and wellness of students and staff
- offering environmental education to boost academic achievement and community engagement.

Green schools have a reputation for excellence

Education facilities that are healthier, more efficient and more productive attract teachers, students and families who value high-quality learning environments. Achieving a Green Star rating can help schools, universities and TAFEs to demonstrate their commitment to creating sustainable, high-performance, healthy and attractive places to learn.

The Bond University Mirvac School of Sustainable Development has found its green credentials – the first 6 Star Green Star Education rating, signifying 'World Leadership' – helpful in attracting international students and developing research partnerships with other prestigious universities around the world. These benefits, alongside the environmental ones, have resulted in a sustainable financial return on their investment.

The reputation that Green Star schools have for sustainability can also help them to secure additional funding. As one Green Star-certified school's Principal has said: "There have certainly been significant financial benefits, which wasn't the intention at the time, but it's brought significant additional funding into the school. It's an unforeseen benefit, but a wonderful one for our school. For example, to raise a million dollars to build a wetland and a new oval would simply not have happened if we didn't have a sustainable focus."

Increasingly, education facilities' commitments to sustainability are setting them apart and giving them a marketing edge. In the highly competitive education market of the US, the Princeton Review's Guide to 322 Green Colleges profiles higher education facilities that demonstrate a significant commitment to sustainability through their academic offerings, campus infrastructure, activities and career preparation. First released in 2010 in partnership with the United States Green Building Council (USGBC), the increasing demand for the guide demonstrates that sustainability is an issue that students are seriously considering when making decisions about where to go to university.

> "As an independently assessed, national, industry-accepted process, Green Star certification has allowed Monash University to be confident that its sustainability aspirations can be delivered and verified. There is no doubt that both building performance and the university's reputation will continue to be enhanced by our commitment to Green Star."
>
> **Brett Walters**
> Environmental Sustainability Manager, Monash University

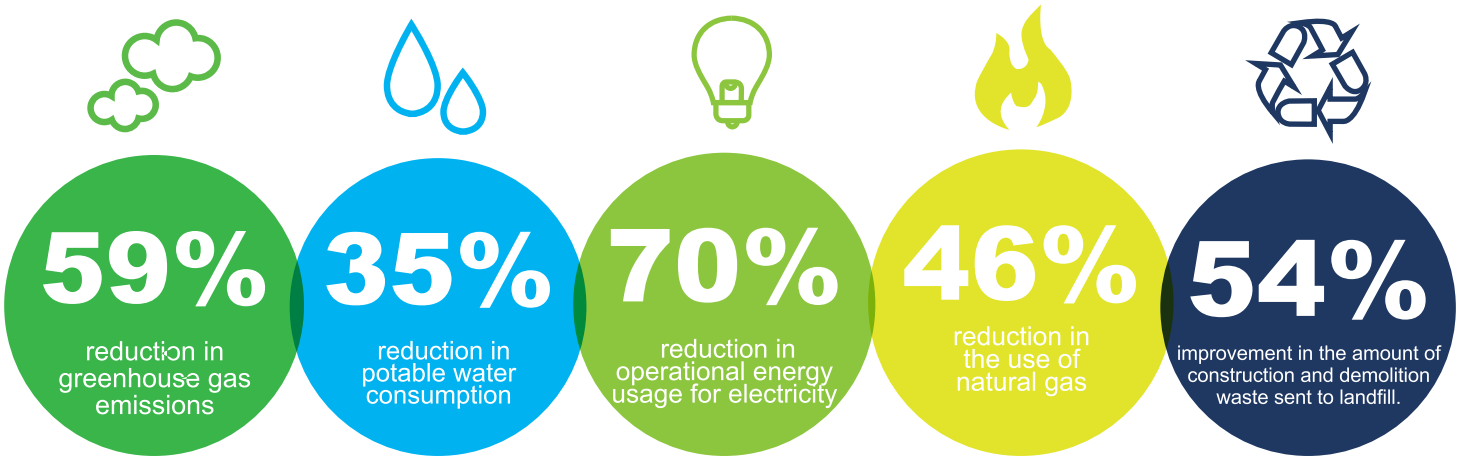
Bond University Mirvac School of Sustainable Development
6 Star Green Star - Education PILOT rating

Green schools are better for the environment

Worldwide, buildings are responsible for up to 30 per cent of greenhouse gas emissions, and approximately 40 per cent of global energy use.[18]

The GBCA's *The Value of Green Star: A Decade of Environmental Benefits* analysed the data from 428 Green Star-certified buildings and compared it to 'average' Australian buildings and minimum practice benchmarks for water, energy, emissions and waste. The study found that Green Star-rated buildings are slashing greenhouse gas emissions, generating significant savings on energy and water-use and have prevented thousands of truckloads of waste going to landfill.

An analysis of the 47 education projects that had been certified under the GBCA Green Star – Education rating tool at the time of the study showed that in comparison to the average performance of existing education buildings, Green Star-rated schools, TAFEs and universities delivered, on average:



Sustainability is prized by the Peregian Springs community

Australia's first Green Star - Education Design v1 primary school, Peregian Springs State School on Queensland's Sunshine Coast is reaping the benefit of its sustainability status, attracting the highest pre-enrolment of any school in Queensland.

The school's 4 Star Green Star rating recognises it as an example of 'Best Practice' in environmentally sustainable design, and has marked the start of a new era of schools that provide better productivity outcomes for staff and students and better environmental outcomes for our planet.

As Principal Gwen Sands says: "It is a pleasure to work in a school which has been built to the highest environmental standards. Studying and working in this facility encourages both our staff and students to act in a more sustainable manner and will help improve learning outcomes for our students."

Top learning environments meet environmental excellence at the University of Tasmania

The University of Tasmania has achieved several Green Star ratings for projects in and around its Hobart campus, from the Institute for Marine and Antarctic Sciences Building to the Medical Sciences Building 2 (MS2). Although very different types of development, both have enabled the University to cut operating costs, improve facility management and operational efficiencies, and demonstrate its leadership role. Several more projects are registered for Green Star.

According to Jacinta Young, the University's Executive Director for Commercial Services and Development: "MS2 will have teaching facilities for more than 1,000 undergraduate students and office and laboratory facilities for 450 staff and postgraduate students. It is important that while the building provides excellent, cutting-edge facilities for students and staff, its environmental impacts are minimised and the building's features are sustainably designed and constructed."

Less emissions, more water, more light at Kimi Ora

Kimi Ora School in Wellington New Zealand is a special needs school that caters for students aged from five to 21 years. In Maori, 'Kimi Ora' translates to "seeking wellbeing in health" or "to be made whole". The school was the first education building to obtain both a 5 Green Star - Education Design and Built certified rating in New Zealand, and has been designed to create a comfortable working environment for students and staff and reduce impact's on the local environment.

Kimi Ora was designed to reduce greenhouse gas emissions in operation by more than 75 per cent in comparison to a typical school. Indoor environmental quality has been improved through the use of low-VOC paints and mixed-mode ventilation (a combination of natural and mechanical air conditioning systems).

Natural lighting is maximised with over 90 per cent of the classroom area within eight metres of an external view. Over 50 per cent of the timber in the building is Forest Stewardship Council (FSC) certified, 100 per cent of the steel has recycled content and locally sourced landscaping materials have been used. Fresh drinking water is conserved and storm water runoff is reduced through the use of rainwater collection and water efficient fittings.[20]

Green schools connect the community

Green schools can play an important part in the development of greener, healthier, more vibrant communities, where people are encouraged to make more sustainable transport choices, to participate in sustainability initiatives and to adopt the sustainable practices learnt at school in their own homes.

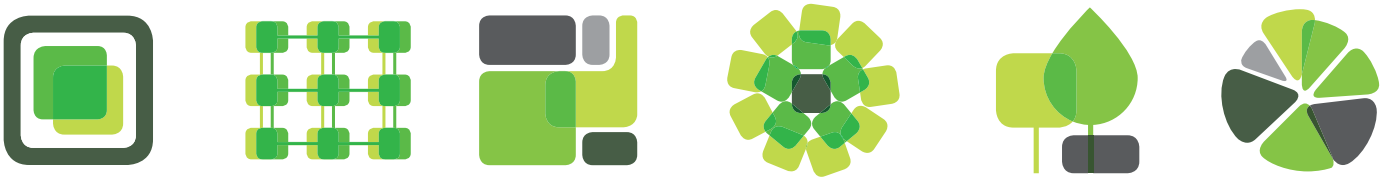
The Green Star – Education rating tool rewards schools that are located within close proximity to transport links such as buses and trains. The environmental benefits of using public transport and having fewer cars on the road are well documented, but reducing the number of cars around schools can also help to increase pedestrian safety.

While existing schools cannot control their proximity to public transport routes, there are still many ways in which existing schools can encourage people to leave the car at home, such as:

- educating students and staff about the environmental and health benefits of using alternative transport modes to get to school
- being bicycle-friendly and providing bicycle storage and facilities
- encouraging students to walk to school or starting a 'walking school bus'
- contributing to the use of smaller vehicles by reducing the number of car spaces available or reconfiguring car parks to increase the ratio of small vehicle spaces
- allocating car parks to fuel-efficient cars (such as 'smart cars' or hybrids) or to those that car pool
- assessing the school's contribution to greenhouse gases through commuting and setting reduction targets.

Green Star – Communities

Green Star – Communities is a voluntary rating tool which provides best practice benchmarks and third-party verification of the sustainability of community and precinct-wide developments across the following categories:



Leadership | Livability | Design | Economic | Environment | Innovation

The Green Star – Communities rating tool has been developed by the GBCA in close collaboration with the market, including all three tiers of government, public and private sector developers, professional services providers, academia, product manufacturers and suppliers and other industry groups. Green Star – Communities was released in PILOT version in June 2012 and aims to assist in delivering well-planned, vibrant communities and precincts.

A campus-wide commitment to community sustainability

The University of Melbourne is Australia's first university to commit to achieving a Green Star – Communities rating. The University of Melbourne's Parkville Campus will be assessed against best practice benchmarks for liveability, prosperity, environmental sustainability, design excellence, governance and innovation.

Working with the GBCA to achieve a Green Star – Communities rating will help the university to minimise its environmental impact and create a learning environment that is efficient, healthy, productive and resilient. A commitment to achieving a Green Star – Communities rating will also encourage the University of Melbourne to consider how it connects with the broader community. The Green Star – Communities rating tool focuses on a range of factors that encourage better links with the broader community. Things like access to amenities, links to transport, pedestrian-friendly design and community engagement will all be measured against best practice benchmarks and will strengthen the links of the university to the broader community.

Green School Bali, connecting the community

Green School in Bali, Indonesia was built using a combination of leading technologies and traditional methods and materials. Green School has a roll of both international and local students and its mission is to deliver a generation of global citizens who are 'knowledgeable about and inspired to take responsibility for the sustainability of the world'.

Green School also has a very strong focus on connecting the community. By establishing a Green School Community Association which welcomes ideas and participation from families and the community, the school is advancing its mission to further improve its sustainability. A range of projects are underway including the development of a healthy food policy, transitioning the school to complete energy-independence and offering tours of the school to the public.

How do we make our schools better?

New buildings

Building a new school or a new building or constructing a new facility within an existing campus is the ultimate opportunity to 'get it right'.

Considering all the benefits to staff and student health, learning outcomes, staff productivity and operational costs that green schools deliver, we must be sure that the design, construction and interior fitouts of new education facilities are nothing short of best practice. Achieving a sustainability certification for the design and construction of a school demonstrates a commitment to the health and wellbeing of that school's students, teachers and staff.

What distinguishes the education sector from other sectors is that health and wellbeing factors are just as important as the financial benefits in the decision to build green. In fact, over 75 per cent of respondents to a McGraw Hill SmartMarket research study into green schools and their occupants cited improvements to indoor air quality and enhancements to the health and wellbeing as key reasons for their green building efforts. The same 2012 study found that by improving indoor air quality, removing toxic materials, optimising lighting conditions and addressing cleanliness and comfort issues, green schools becomes a learning environment capable of improving the academic performance of the students that attend them.[21]

Sustainable education for our regional centres

"Charles Sturt University is demonstrating real leadership in Green Star education facilities. This latest Green Star rating [for the Charles Sturt Life Science Building] is the second certified project, with the other being the University's Academic Accommodation 3 at Albury-Wodonga which has a 6 Star Green Star - Office Design v2 rating. The proposed Early Learning Centre at Wagga Wagga is also a registered Green Star project. We are demonstrating that Green Star ratings do not have to be confined to the major metropolitan centres," says Charles Sturt University Green Manager , Edward Maher.

Williamstown High School, Bayview Campus
5 Star Green Star - Education PILOT rating

> “We have a responsibility to preserve and protect our environment and we would be totally irresponsible not to look towards having the best Green Star rating that we can.”

Heather Lindsay
Principal, Keysborough Secondary College, Victoria

Green Star - Design & As Built

The Green Star environmental rating system was developed to establish a common language and set a method of measurement for green buildings, to promote integrated, whole-of-building design, recognise environmental leadership, identify building lifecycle impacts and raise awareness of green building benefits.

The Green Star Design and As Built rating tools certify building projects that achieve best practice sustainability outcomes or better. This means that a newly designed or constructed Green Star school, TAFE or university building can achieve a Green Star certified rating of:

- 4 Star Green Star (‘Best Practice’)
- 5 Star Green Star (‘Australian Excellence’)
- 6 Star Green Star (‘World Leadership’).

Released in 2008, the Green Star – Education v1 rating tool assesses the environmental attributes of new and refurbished education facilities across Australia. It can be applied from the design phase of a school building project until two years after the building is completed. More than 70 education building projects have now been certified using the Green Star – Education rating tool nationwide.

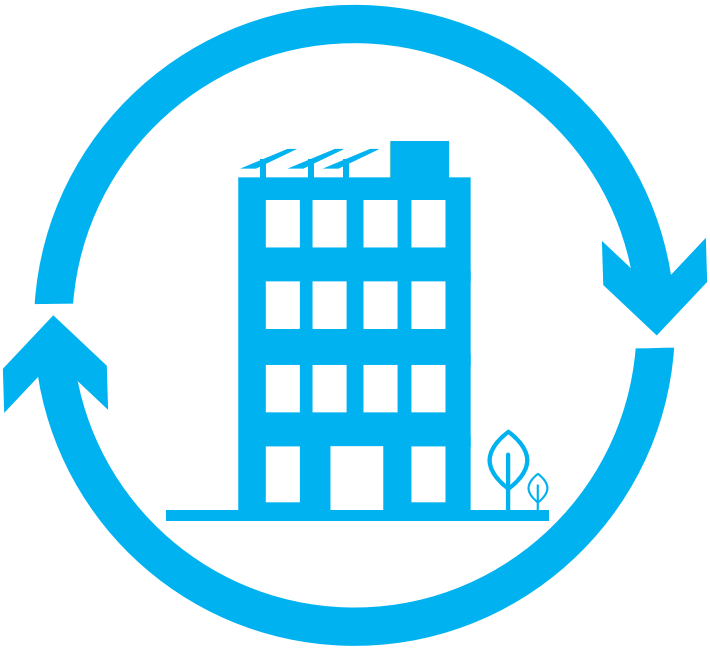
Green Star certification demonstrates a commitment to the creation of healthier, more sustainable schools that meet best practice benchmarks. Using Green Star rating tools also ensures that the levels of sustainability that are promised in the design phase are delivered in construction as well.

Existing buildings

Each year, only two per cent of Australia's buildings are considered 'new'. Like the commercial and residential sectors, the education sector has a large proportion of ageing facilities which have often been built to meet only minimum building code requirements.

All too often, the result is water- and energy-hungry buildings that are poorly designed, uncomfortable and costly to run.

Existing school buildings represent a huge cost-saving opportunity through simple improvements to energy and water efficiency. They also represent a golden opportunity to increase student and teacher health and productivity through improvements to indoor environment quality.



Sustainable living and learning at Monash University

Monash University has achieved multiple Green Star ratings for buildings across its campuses including the research facility for material engineering known as New Horizons and the Monash Peninsula Activity and Recreation Centre. The university can also lay claim to the first Green Star – Multi Unit Residential rating for its student housing project - Briggs and Jackomos Halls.

"As an independently assessed, national, industry-accepted process, Green Star As Built has allowed Monash University to be confident that its sustainability aspirations can be delivered and verified. All construction industry participants understand Green Star and this aids the delivery of sustainable outcomes. Monash remains confident that the continued use of the Green Star suite of tools will improve the performance and reduce the environmental impacts of its buildings."

Brett Walters
Environmental Sustainability Manager,
Monash University

Green Star – Performance

The Green Star – Performance rating tool has been designed to assess the operational performance of existing buildings of all uses, whether or not they have achieved a Green Star certification for their design and construction. Green Star – Performance is the only rating tool to provide a comprehensive, holistic assessment of building operations across the nine impact categories of management, indoor environment quality, energy, water, materials, land use and ecology, emissions, transport and innovation.

Green Star – Performance will enable schools to measure and benchmark their buildings' operational performance, set targets to increase energy and water efficiency, reduce waste and improve factors that influence productivity and health, such the amount of fresh clean air and natural light provided to interior spaces.

Using Green Star – Performance helps schools to identify where a building is performing well and highlight areas that may need improvement. This information supports decision-making about investment in incremental improvements and where best to devote resources for upgrades to facilities and management practices.

Green Star – Performance has been developed by the GBCA with extensive consultation with government and industry to ensure achieving a Green Star – Performance rating is a simple and cost-effective process that delivers rigorous, third-party verified results.

Green Star – Interiors

Green Star – Interiors is a new environmental rating tool that assesses the sustainable attributes of building fitouts.

Education facilities can use Green Star – Interiors to assess the fitouts of new and existing buildings and ensure that the spaces in which people work and learn are well-designed, healthy and productive. Like the other Green Star rating tools for design, construction and operational performance, Green Star – Interiors includes best practice benchmarks across nine impact categories.

Other options for greening your education facility

In addition to Green Star, there are many other opportunities for making our schools happier, healthier and more sustainable.

Schools can access a range of initiatives offered by governments, not-for-profits, community groups and the private sector to improve their facilities. Initiatives and incentives are on offer to help schools implement water saving and renewable energy technologies, implement energy efficiency measures and improvements to ventilation and daylight access, make better product and materials choices and invest in environmentally friendly landscape design.

Lessons on renewable energy from the National Solar Schools Program

In addition to offsetting energy expenditures in schools, school solar projects offer students a hands-on opportunity to learn about renewable energy technology.

The Australian Government's National Solar Schools Program (NSSP) awarded $217 million to 5,310 schools (almost 60 per cent of all Australian schools) to install renewable energy systems, rainwater tanks and a range energy efficiency measures. Under the NSSP, eligible schools received grants of up to $50,000 to install solar power or other energy efficiency technologies, such as ceiling fans, energy-efficient lighting or skylights. The funding has helped to educate students about energy efficiency and renewable energy, and that everyday actions can prevent millions of tonnes of carbon pollution.

Wangaratta High School
4 Star Green Star - Educaion PILOT rating

Improving schools through the Australian Sustainable Schools Initiative (AuSSI)

The Australian Sustainable Schools Initiative (AuSSI) is a partnership of the Australian Government and state governments to deliver programs that provide practical support to schools and communities in their efforts to become more sustainable.

AuSSI engages and supports students, staff and community members to improve the management of a school's resources and facilities, including energy, waste, water, biodiversity, landscapes, products and materials. It also integrates these activities with teaching and learning across the curriculum.

AuSSI achievements include:

- Almost 30 per cent of Australian schools are now AuSSI schools, including public, Catholic and independent schools (both primary and secondary)
- AuSSI schools are achieving immediate and measurable improvements in their operational performance. Participating schools have reported reductions in waste collection of up to 80 per cent, reductions in water consumption of up to 60 per cent, and savings on energy consumption of 20 per cent, with corresponding reductions in greenhouse gas emissions
- Schools are achieving a range of social and educational benefits from increased school pride and interest in learning
- Families of AuSSI school students across Australia have been influenced by their children's participation in AuSSI.

Who can help?

Government

If we are to achieve our vision of healthy, productive education facilities that contribute to, rather than inhibit students' learning, we need governments to commit to ensuring that all education facilities meet best practice benchmarks.

While state and territory governments have primary responsibility for school infrastructure, federal and local government also have roles to play in supporting better outcomes for our places of learning. We believe that governments cannot afford to ignore the far-reaching benefits of healthier, greener schools for Australia's productivity and competitiveness, the nations' long-term health and wellbeing, and spending on ongoing operational costs.

> "It's about showing leadership in the community."
>
> **Rob Dalton,**
> Department of Education, Tasmania

We call on governments to:

- **conduct a sustainability audit of all government-administered education facilities**
- **commit immediate funding to ensure that school facilities that do not meet minimum standards can be improved without delay**
- **commit funding so that schools can implement programs for continuous improvement and investment to bring their facilities up to best practice benchmarks**
- **commit to achieving environmental ratings for all schools within five years and provide financial and non-financial support and incentives for private and tertiary education facilities to do the same**
- **provide financial and non-financial support for stakeholders in the education sector to work together to establish an Australian Centre for Green Schools that brings people, initiatives, resources and information together.**

Teachers, students, industry and the broader community

Creating better schools should be everybody's business. We believe that there should be a place where people who want to create sustainable change for Australia's schools - big or small - can go to access resources and information on the initiatives and tools that are available.

In the US, the United States Green Building Council's Center for Green Schools was established with the mission to create green schools for all Americans within one generation. The Center for Green Schools is an information hub that brings together resources and initiatives for improving the sustainability of schools, and works to foster partnerships and lead initiatives of its own.

Here in Australia, Sustainable Schools NSW is a hub of resources and information for school communities interested in protecting their local environment. It includes information about the funding opportunities and programs available across the state and helps connect members of the community to others who are committed to taking action for sustainable schools.

The GBCA wants to drive the establishment of an Australia-wide network of stakeholders and a 'hub' that will do all of these things and more, but we will need your help.

We call on teachers, students, families, communities, not-for-profits and the private sector to:

- **contact us to discuss how Green Star can help you to make your school a more sustainable place for learning**
- **explore the initiatives, organisations and resources mentioned in this paper to discover the options available for greening your school and community**
- **contact us to express your interest in joining an Australia-wide network of stakeholders and contributing to the establishment of an Australian Centre for Green Schools**
- **call on your local and state government representatives to commit to more sustainable Australian schools, for the benefit of our kids, teachers, community and economy.**

Acknowledgments

WORLD GREEN BUILDING COUNCIL

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