



Australian Government
Australian Trade and Investment Commission



green
building
council
australia

AUSTRALIAN GREEN BUILDING

Developing a smart,
sustainable ASEAN

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Royal Adelaide Hospital

INTRODUCTION

Australia's reputation as one of the leaders of the global green building movement reflects a long-term commitment to sustainability and a widespread spirit of collaboration. Today, Australia's property industry regards superior sustainability as a symbol of quality.

The global real estate sustainability benchmark, GRESB, ranks the Australian real estate market as the world's greenest.¹ Meanwhile, Australian companies Mirvac Group, Stockland and The GPT Group have led the Dow Jones Sustainability Index for the last decade.²

Australia's highly skilled workforce, visionary companies and forward-thinking policymakers are committed to collaboration, transparency and knowledge-sharing along the length of the construction supply chain.

“Australian companies, through the Green Building Council of Australia (GBCA), have forged strong partnerships with many counterparts in ASEAN, as we work together to accelerate the uptake of sustainable building practices in the world's economic powerhouse.”

Romilly Madew, Chief Executive Officer, GBCA

“Already equivalent to the fifth largest economy in the world, the ASEAN region is expected to grow by at least 5.4 per cent each year for the next decade and beyond — well above the global average.³ In this context, opportunities for Australian and ASEAN companies to work together are endless.

The ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) and bilateral FTAs with Malaysia, Singapore and Thailand deliver Australian urban service firms a competitive edge. What's more, the Regional Comprehensive Economic Partnership and a future bilateral trade agreement with Indonesia will present new opportunities for Australian and ASEAN businesses to connect and collaborate.

Together with its proximity to ASEAN nations, Australia is an ideal partner to develop green building projects that support growth, invest in communities and prepare the region for a low-carbon future.

Talk to your local Austrade representative for tailored advice and to partner with Australia's green builders.

GLOBAL CONTEXT

The United Nations estimates that cities generate 70 per cent of the world's carbon emissions,⁴ and buildings alone produce around 40 per cent of total greenhouse gas emissions.⁵

At the same time, nations are rapidly urbanising, and more than one in three of us will live in cities by 2030.

At the intersection of urbanisation and climate change sits a solution that can cut carbon emissions, boost productivity and enhance the health and wellbeing of people. And that solution is green building.

Australia can help ASEAN nations manage growth in innovative, economic and environmentally-sustainable ways. By 2030, it is anticipated that 40 cities across ASEAN will have populations of 1 million or more.⁶ According to the Green Building Council of Australia (GBCA), Australia will construct more than 40 million square metres, or 215 million square feet, of certified green building space by 2020.

The maturity of the Australian green building market is underscored by the strength of the GBCA, and the widespread adoption of the internationally recognised Green Star rating system.

As a foundation member of the World Green Building Council's Asia Pacific Network, the GBCA collaborates on cross-regional projects and research, and has strong relationships with green building councils in Hong Kong, Singapore, Malaysia and Indonesia.

Green Star has transformed Australia's approach to the design and delivery of buildings, communities and cities, and this scalable system has been widely adopted in other markets, notably New Zealand and South Africa.

Australia has proved the perfect testbed for some of the world's most innovative sustainable building solutions. Early adoption of technologies, such as child beam cooling and cross-laminated timber, have led to widespread efficiencies and emissions reductions throughout the country.

Famed international projects – from Beijing's Watercube, designed by PTW Architects, to London's International Quarter, developed by Lendlease – are influenced by Australian talent.

COLLABORATING TO CUT CARBON EMISSIONS

In 2017, the Australian Government launched the National Carbon Offset Standard for Buildings and the National Carbon Offset Standard for Precincts. These standards, developed through close collaboration between the Australian Government, the National Australian Built Environment Rating System (NABERS) and the Green Building Council of Australia (GBCA), provide clear definitions of carbon-neutral buildings and precincts in operation. Building owners can use the robust Green Star or NABERS process to demonstrate compliance. See environment.gov.au/climate-change/government/carbon-neutral/ncos for more information.

Australia's Commercial Building Disclosure program, which requires most sellers and lessors of large office spaces to provide energy efficiency information to prospective buyers and tenants, was recently expanded, and now covers any commercial office building in Australia more than 1,000 square metres in size.

This measure alone is expected to deliver \$50 million in new energy savings and around 3.5 megatonnes of carbon in just five years.

INDUSTRY STRENGTHS

Australia's harsh climate and scarce water resources mean sustainable building is an economic and environmental necessity. Australians are accustomed to working with weather extremes and diverse geographies, in remote locations and in challenging city environments.

Green building gained momentum in Australia after the Sydney Olympics in 2000. Australia's venues and facilities established new best practice benchmarks and showcased sustainability at scale. Since then, its expertise has evolved and Australia now boasts arguably the world's most mature green building market.

The benefits of Australia's sustainable approach stretch far beyond the environment. Australian green building expertise presents governments and corporations around the world with practical solutions to lower operating costs, increase building values and improve the health and productivity of citizens.



Nishi Building, Canberra

Australia's experience in large-scale sustainable projects is world-renowned – from hospitals to hotels, shopping centres to schools, and from masterplanned communities to city infrastructure.

Among Australia's sustainability stars are Westfield Sydney, one of the most visited shopping malls in the world; One Central Park, a globally admired tall building adorned with living green walls; and Barangaroo South in Sydney, on track to be the first carbon-neutral precinct globally.

Australian firms behind these green icons now penetrate export markets and provide green building expertise to urban projects throughout the world. At the heart of this revolution are clear sustainable building guidelines, consistent regulation and stable policy settings.

COLLABORATING TO CUT CARBON EMISSIONS

Australian industry strengths and export-ready firms are world leaders in:

- › Carbon adaptation
- › Lifecycle analysis and energy modelling
- › Sustainable building design
- › Environmentally Sustainable Design (ESD) engineering
- › Energy-efficient lighting, heating, ventilation and air-conditioning (HVAC)
- › Environmentally and economically efficient water systems
- › Building management systems
- › Recycled, low-toxicity and modular building products.

SUSTAINABLE MATERIALS

Australia's mature green building market has driven large-scale innovation across the supply chain. The property and construction industry works closely with manufacturers and researchers to develop products and materials that comply with benchmarks for emissions, recycled content and product stewardship. Four outstanding examples are included here.

Sustainable steel

The Centre for Sustainable Materials Research and Technology (SMaRT) is leading scientific and engineering research into the sustainability of materials and manufacturing processes. Researchers have discovered a process to turn waste into high-quality steel. This new approach has not only improved steelmaking in Australia but led to valuable exports, with 'green steel' now commercialised in Asia, Europe and Britain.

Cross-laminated timber champions

Australia boasts the world's tallest timber high-rise towers, including Forté and Library at the Dock in Melbourne, International House in Sydney and the King Street office tower in Brisbane. Each building is made from prefabricated wooden panels of cross-laminated timber, which reduces the energy-intensity of the construction process, while providing long-term carbon capture. The ability to prefabricate elements of buildings – or the whole development – means less waste, less transport and faster construction times.

Prefabrication pioneers

Hickory Building Systems has pioneered a patented building technology that accelerates construction programs by up to 50 per cent, minimises material and energy waste, and maximises quality and safety. Australia's tallest prefabricated building, the 133-metre-high, 44-storey La Trobe Tower in Melbourne, is a celebrated example of Hickory's success. The Council on Tall Buildings and Urban Habitat named Hickory Building Systems a finalist in the prestigious 2018 Best Tall Building Awards in the Innovation category.

Cool roof revolutionaries

Developer Stockland has been working with Australia's **Cooperative Research Centre for Low Carbon Living** to test cool roof strategies on shopping centres and large-scale communities. A range of cool roof materials and colours have been put through their paces to determine which reflects the most sunlight and absorbs the least heat. Stockland is now using the lessons learnt to ensure its new communities combat the heat island effect.

SUPPORTIVE REGULATION

Australia is well known for its robust regulatory environment, which has made it one of the world's most desirable destinations for property investors.

The country's commitment to collaboration is just as robust. Government and industry – led by the GBCA and others – work together to shape regulation that supports more sustainable outcomes. By working together, Green Star and NABERS have become nationally adopted.

For example:

- › The **Building Code of Australia** has strict energy efficiency provisions for both residential and commercial buildings, and minimum energy performance standards are mandatory in all states and territories. Industry and government work together to make sure the Code continues to address climate change.
- › The **Commercial Building Disclosure** scheme requires the NABERS energy efficiency rating of any commercial building larger than 1,000 square metres to be disclosed at the time of sale or lease. This has driven higher levels of transparency, with more than 2,000 buildings in the NABERS directory.
- › The **Nationwide House Energy Rating Scheme** (NatHERS) is a mandatory star rating system that assesses the energy efficiency of a home, based on its design.

MAXIMISING ENVIRONMENTAL PERFORMANCE

NABERS, the National Australian Built Environment Rating System, measures the environmental performance of buildings, tenancies and homes. Buildings are assessed and awarded an individual rating, whether for energy, water, waste or indoor environment quality.

In comparison, Green Star assesses buildings against nine environmental impact categories and awards a holistic rating. The rating systems work in harmony, and many building owners achieve both NABERS and Green Star ratings.

nabers.gov.au



AUSTRALIAN INGENUITY

Established leaders and emerging entrepreneurs across the breadth of Australia's property and construction industry are carving out their niche in one of the world's strongest sustainable building markets. Here are three examples of Australian ingenuity and innovation at work.



Image caption appears here

COX ARCHITECTURE

With offices in Australia, Malaysia and the Middle East, COX integrates architecture, planning, urban design and interior design.

COX designs find balance between the built and natural environments. Sometimes, this means rehabilitating natural landscapes, in other cases nature may provide an alternative solution. In other instances, COX responds to natural forces like floods, winds and other climate concerns.

Perth's Katitjin Centre is just one COX legacy. Smart site orientation ensures this emissions-neutral building benefits from high levels of daylight penetration while reducing thermal loads.

Air-conditioning and ventilation systems don't need to work as hard, and the lighting is only used sparingly, reducing demand in two areas of high energy use.

The orientation, coupled with highly efficient systems, allows the Centre's remaining energy requirements to be met by the installed solar array.

A 42,000-litre rainwater tank and a 'xeriscape' garden at the Katitjin Centre also make it a water-wise wonder.



69 Robertson Street, Brisbane

FLOTH

Working on major projects in Australia and Asia, notably Indonesia and East Timor, Floth has earned a reputation for technically excellent, commercially viable and sustainable designs.

Floth pioneered now established building services solutions in Australia, and deploys a range of technologies, from building information modelling to computational fluid dynamics.

Floth's 69 Robertson Street building in Brisbane won the World Green Building Council 2016 Asia Pacific Leadership in Green Building Awards for its sustainable design and performance.

This net zero building has halved operational carbon emissions through a smart façade design and leading-edge building services. A roof-mounted solar photovoltaic system offsets another 28 per cent of the building's final operational energy.

But Floth hasn't stopped at energy efficiency. Water-saving measures—from a roof collection system to efficient fixtures and fittings – deliver a 76 per cent water saving on business as usual activities.



Legion House, Sydney

GROCON

From the sparkling office tower at Sydney's 1 Bligh Street to sustainable social housing developments around Australia, Grocon is one of the country's most experienced construction, development and residential real estate companies.

Take the company's work on Australia's first zero net emissions office building, Pixel in Melbourne. Grocon's team tested a range of technologies, from an industry-leading vacuum toilet system to the most efficient solar panels on the market at the time.

Pixel, which generates more energy than it uses, was also constructed so the building envelope can be removed and reused – reducing the building's carbon footprint when it reaches the end of its useful life.

Meanwhile, Legion House in Sydney demonstrates a carbon-neutral future is possible with the help of existing buildings.

Legion House is disconnected from the grid and all power is produced onsite. Energy is generated through a gasification system which uses recycled woodchips, timber offcuts and even paper from adjacent office towers.

Meanwhile, water balance is achieved through advanced water conservation technology, high-efficiency fixtures, vacuum toilets and rainwater recycling.

With offices in Sydney, Melbourne, Brisbane and New York, Grocon has built a reputation for solving complicated sustainability problems in an evolving market.



Royal Adelaide Hospital precinct

SUSTAINABILITY SHOWCASE

ONE CENTRAL PARK, SYDNEY

Australia's sustainability specialists were a natural fit for Singaporean developer Frasers Property, as it shaped the multi-stage Central Park precinct.

At its heart sits One Central Park. From the stunning vertical gardens and heliostat to on-site water recycling and thermal tri-generation plants, One Central Park packs a punch.

The most eye-catching sustainable innovation is the 120-metre vertical garden enveloped by 35,000 plants. The 1,120-square-metre green wall improves the building's efficiency and reduces the urban heat island effect, while also enhancing air quality, biodiversity and human health.

One Central Park's heliostat is made up of more than 40 mirrors which track the sun's path and reflect light up to an area that would otherwise be in shade.

Flow System's one million litre 'membrane bioreactor' is the world's largest recycled water facility of its kind treating all wastewater on site including effluent to such a high quality for toilet flushing, clothes washing, air cooling and irrigation - halving potable water consumption and setting new Australian benchmarks for water-sensitive living.

Meanwhile, Brookfield's tri-generation plant simultaneously produces electricity, heating and cooling and can provide power, hot water, space heating and air-conditioning. This system supports 3,000 residences and 65,000 square metres of retail and commercial space. It will reduce greenhouse gas emissions by 190,000-plus tonnes over the 25-year life of the plant – equivalent to removing 2,500 cars from the roads every year.



Project team

- › **Acoustic consultants:** Acoustic Logic
 - › **Architects:** Atelier and PTW Architects
 - › **Building services engineer:** Arup Australasia
 - › **Landscaping consultants:** Jeppe Aagaard Andersen, Turf Design Studio and Oculus
 - › **Main contractor:** Watpac Construction
 - › **Quantity surveyor:** Davis Langdon Australia
 - › **Structural and civil engineer:** Robert Bird
- Group
- › **Sustainability consultant:** Savills Australia



480 QUEEN STREET, BRISBANE

Featuring the first elevated public park in the Southern Hemisphere, 480 Queen Street is a 32-storey vertical village with sustainability at its heart.

The building boasts a rooftop grove that offers some of the best views of Brisbane, while the 1,400-square-metre public park on level four features a 100-seat amphitheatre for events, bars, restaurants and a boutique gym.

The building's high-performance glazing manages solar heat gains while maximising daylight, which reduces the need for air-conditioning and improves thermal comfort. All timbers were sourced from sustainable plantations or were recycled. More than 80 per cent of construction and demolition waste was diverted from landfill.

480 Queen Street is the first property in Queensland to commit to WELL certification, the world's first building standard focused exclusively on human health.

Project team

- › **Acoustic consultants:** Acoustic Logic and Marshall Day Acoustics
- › **Architect:** Bligh Voller Nield
- › **Building services engineers:** AECOM and H Design
- › **Landscaping consultant:** Lat27
- › **Main contractor, project manager and quantity surveyor:** Grocon
- › **Structural and civil engineer:** Aurecon Australasia
- › **Sustainability consultant:** Cundall and Lat27





171 COLLINS STREET, MELBOURNE

Fusing a heritage façade with modern design, 171 Collins Street features myriad best practice sustainability features.

Among its clever technologies, 171 Collins Street includes an Australian-first ceiling tile system that absorbs office pollutants and creates a healthier office environment for workers.

Meanwhile, its innovative grey water treatment program collects used water from the cyclist shower facilities and recycles it through the building's cooling towers and toilets, offsetting more than 90 per cent of the cooling towers' water consumption.

The outside of the building is similarly impressive, with 171 Collins Street's façade a big driver of cost efficiency. This high-performance façade folds light from the sky into the base of the building, helping achieve energy efficiency targets.

Project team

- › **Acoustic consultant:** Acoustic Logic
- › **Architect:** Bates Smart Architects
- › **Building services engineers:** Umow Lai
- › **Building surveyor:** PLP Building Surveyors & Consultants
- › **Main contractor:** Multiplex Australasia
- › **Project Manager:** APP Corporation
- › **Quantity surveyor:** Rider Levett Bucknall
- › **Structural and civil engineer:** Winward Structures
- › **Sustainability consultant:** Umow Lai





ROYAL ADELAIDE HOSPITAL

One of the largest and most technically complex Green Star buildings in Australia, the 800-bed Royal Adelaide Hospital provides care to 85,000 inpatients and 400,000 outpatients each year.

Spanning three city blocks on a pristine site containing almost four hectares of landscaped parks and internal green space, the hospital features more than 70 courtyards, terraces and sky gardens.

Optimised for daylight, the hospital offers the best possible healing environment with greater levels of privacy, comfort and infection control.

By prioritising energy efficiency, the hospital also generates half the greenhouse gas emissions of standard-practice healthcare facilities.

Project team

- › **Acoustic consultant:** Norman Disney & Young
- › **Architects:** Silver Thomas Hanley and DesignInc
- › **Building services engineers:** Bestec and Lehr Consultants International (Australia)
- › **Building and quantity surveyors:** Hansen Yuncken and CPB Contractors-Cimic Group
- › **Landscaping consultant:** Tract Consultants
- › **Main contractors and project managers:** Hansen Yuncken and CPB Contractors-Cimic Group
- › **Structural and civil engineers:** Wallbridge and Gilbert



ABOUT AUSTRADE

The Australian Trade and Investment Commission – Austrade – contributes to Australia's economic prosperity by helping Australian businesses, education institutions, tourism operators, governments and citizens as they:

- › develop international markets
- › win productive foreign direct investment
- › promote international education
- › strengthen Australia's tourism industry
- › seek consular and passport services.

Austrade helps companies around the world to identify and take up investment opportunities in Australia as well as to source Australian goods and services. Our assistance includes:

- › providing insight on Australian capabilities
- › identifying potential investment projects and strategic alliance partners
- › helping you identify and contact Australian suppliers.

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E info@austrade.gov.au

RESOURCES

ASEAN Now: Insights for Australian business:

<http://dfat.gov.au/about-us/publications/Documents/asean-now-insights-for-australian-business.pdf>

Australian Green Building Industry overview

Austrade's Australian Green Building Showcase: [https://www.austrade.gov.au/MultiMediaFiles/Australian-Green-Building-Industry-Showcase/Green and Sustainable Building Report 2013](https://www.austrade.gov.au/MultiMediaFiles/Australian-Green-Building-Industry-Showcase/Green%20and%20Sustainable%20Building%20Report%202013)

[Austrade to insert list of resources and links]



PLACEHOLDER IMAGE ONLY

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