

ENERGY UPGRADE

The property industry is in a prime position to benefit from the Australian Government's Emissions Reduction Fund, which is open for business and gearing up for the first auction early this year.

I'm pleased the Property Council engaged with the government on the design of the Emissions Reduction Fund. Now council members and the wider industry have the opportunity to 'get in at the ground floor' with this new emissions reduction method.

The Emissions Reduction Fund is based on the Carbon Farming Initiative, which provided incentives for land-sector businesses to store carbon in their soils and reduce emissions from their business operations. The Emissions Reduction Fund will apply the proven approach of carbon farming to the entire economy.

Participants will use 'methods'—the rules that estimate emissions reductions from proposed activities—to develop projects that reduce greenhouse gas emissions. The Clean Energy Regulator will verify those reductions are viable and the participant can then bid their emissions reductions, known as Australian carbon credit units (ACCUs), into an auction. The government will buy the lowest-priced ACCUs through the \$2.55-billion fund.

Projects are eligible to participate in the Emissions Reduction Fund if they are 'additional'. This means they must be new, not required by law and not already receiving financial support as part of another government program.

It's significant that the first non-land-sector method available is in the commercial property sector. The



GREG HUNT
Minister for the Environment.

commercial buildings method will reduce emissions by improving the energy efficiency of commercial buildings, using star ratings and other tools from the National Australian Built Environment Rating System (NABERS) to calculate emissions reductions.

Any office building, shopping centre or hotel that can be rated by NABERS could use this method. Projects could include installing more energy-efficient lighting or appliances, upgrading glazing or adopting improved energy management systems in the building.

Also in the pipeline is a commercial lighting method that covers lighting upgrades to commercial and public buildings, streetlights and traffic lights. This method will be largely based on similar state programs and use simple calculations with deemed values in determining abatement to enable easy participation.

This is an exciting time for the property sector to participate in a new venture to upgrade the energy efficiency of commercial property stock, improve the sustainability of their portfolios and help Australia meet its international targets for cutting greenhouse gas emissions. 🌱

Visit www.cleanenergyregulator.gov.au for more information.

[THE FUND] WILL APPLY THE PROVEN **APPROACH OF CARBON FARMING TO THE ENTIRE ECONOMY.**

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EDITH GREEN-WENDELL
WYATT FEDERAL BUILDING |
ONE WORLD TRADE CENTER
| LIVING PLANET CENTRE |
DE ROTTERDAM | 8 CHIFLEY
| TE MIRUMIRU | LIBRARY
AT THE DOCK | NO. 1 SILO |
COCO PALMS | TRADE AND
INDUSTRY TOWER | 52 LIME
STREET | KUWAIT INT'L
AIRPORT | WANGJING SOHO

13
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BRILLIANT BUILDINGS

AUTUMN 2015 | SUPPLEMENT

WORDS:
CAMERON COOPER



Edith Green–Wendell Wyatt Federal Building, Portland, US.

Great green buildings are in vogue around the world.

Once regarded in some quarters as an indulgence or too expensive to construct, sustainable buildings are now seen by many property owners and developers as a smart investment—both financially and in terms of strengthening their brand ethically. From North America, Australia and Europe, to Asia and South Africa, some brilliant green buildings are making a big impression while leaving a smaller environmental footprint. To provide a snapshot of current trends and innovations in sustainable design, we profile 13 buildings that have been constructed recently or will open their doors in the coming months and years. Our list is by no means exhaustive, but it does recognise superb sustainable design and construction that is making a difference to tenants, workers and the environment.

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Brilliant Buildings is brought to you by:



VERTICAL CITY

De Rotterdam,
Rotterdam, Netherlands



Big on vision. Big in scale. Big on sustainable features. Everything about De Rotterdam, the largest mixed-use building in the Netherlands, is immense.

This 'vertical city' in Rotterdam is 150 metres tall, weighs about 230 million kilograms and, when it reaches capacity, will cater for about 6000 people a day. Dominating the harbour district of Wilhelmina Pier, it was named the Best Tall Building in Europe 2014 by the Council on Tall Buildings and Urban Habitat.

"We are very proud," says Mischa Molsbergen, project director at MAB Development. He says people in Rotterdam—a city that lost many of its greatest buildings as a result of World War II bombings—take a keen interest in modern structures such as De Rotterdam.

"The general opinion is that

people are very proud of it because it's an exceptional building, and the reactions are positive because it's not a standard Dutch building."

Molsbergen says construction was an "epic challenge" on such a massive building, with sustainability at the heart of design from day one. De Rotterdam comprises three interconnected towers accommodating offices, apartments, a hotel and conference facilities, plus retail outlets. The defining green feature is the building's ability to heat and cool itself using water from Maas River.

"We don't need power or heating or cooling from another source," Molsbergen says. "It can all be produced in the building itself."

Regenerative drive lifts return power back to the grid, while there is cogeneration of energy using biofuel.

50,000
SQM OF GLASS
IS USED IN
DE ROTTERDAM

Given the fallout from the GFC and the subsequent dearth of mega-construction projects in Europe, Molsbergen concedes that buildings of De Rotterdam's ilk are likely to be rare, at least in the short term.

"If we'd started the project a year or so later, it would not have been built," he says.

MIXED-USE BUILDING

BREEAM RATING: EXCELLENT

COST: 340 million euros (AU\$500 million)

COMPLETED: 2013

DEVELOPERS:

MAB Development; OVG Project Development

DESIGNER:

Rem Koolhaas, Office for Metropolitan Architecture

BUILDER:

Züblin Nederland; KONE (elevators and escalators)

TRUE LANDMARK

Library at The Dock, Melbourne, Australia

Two firsts have sealed Library at The Dock's reputation as a new sustainable civic landmark in Melbourne. It's the first public building in Australia to receive a 6 Star Green Star rating and it's the first community building to be made predominantly from cross laminated timber (CLT).

Located on the waterfront of Victoria Harbour in the heart of Docklands, Library at The Dock is a three-storey construction and is regarded as the nation's most sustainable community building.

Geoff Dutaillis, group head of sustainability at Lend Lease, says the library and community centre make an important contribution to Melbourne's famous cultural spirit.

"The best places we create are those that connect with people," he says, "places where people prefer to spend their time, places that promote health and wellbeing and deliver long-term economic value."

The use of CLT significantly reduces the carbon footprint of the building and cuts its weight by about 30 per cent—an important factor given the library sits on a 75-year-old wharf. The engineered timber also delivers outstanding thermal performance. The library's striking facade consists of recycled ironbark and tallow wood timbers.

Full-height glazing on the first floor maximises natural light, while the building's passive ventilation design and smart use of solar power and water recycling enhance the site's sustainability.

Water collected from the roof is discharged to a 35,000-litre tank for re-use within the building. A third of the library's operational power is supplied from roof solar panels.

Councillor Arron Wood, chair of the City of Melbourne's environment portfolio, says Library at The Dock is a revolutionary addition to the city's skyline and represents world leadership in sustainable design.

"The City of Melbourne has set ambitious climate and environmental requirements for its operations," he says. "The library has set the standard for future public buildings in the municipality, helping us evolve into a truly sustainable city."

PUBLIC BUILDING

GREEN STAR RATING: ★★★★★

COST: \$23 million

COMPLETED: 2014

DEVELOPERS:

Lend Lease; City of Melbourne; Places Victoria

ARCHITECTS: Clare Design (design architect); Hayball (architect of record)

BUILDER: Lend Lease

ENGINEERS: Gavin McAuley, Robert Bird Group





WATERFRONT STUNNER

No. 1 Silo, Cape Town, South Africa

OFFICE BUILDING

GREEN STAR SA RATING: ★★★★★★

COST: Confidential
COMPLETED: 2013
DEVELOPER: V&A Waterfront
DESIGNERS: Rick Brown & Associates Architects; VDMMA Architects
GREEN SUSTAINABILITY CONSULTANT: Arup
FACADE, ICT AND MECHANICAL ENGINEERS: Arup
STRUCTURAL AND CIVIL ENGINEERING: Sutherland



No. 1 Silo in Cape Town is a trailblazer for sustainable buildings in South Africa.

A truly intelligent building, it has a seawater cooling system, energy-monitoring innovations that identify opportunities to save power, a double-skin glass facade that helps to control the building's thermal performance and maximises the use of natural light, and a 'green' roof that enhances insulation and aids stormwater retention.

These attributes have seen the property receive the nation's first 6 Star Green Star SA As-Built rating. It also previously gained a 6 Star rating for Design, making it a '6 Star double' that sets the benchmark for other developers to follow.

David Green, chief executive of V&A Waterfront, says No. 1 Silo demonstrates the group's commitment to sustainability leadership.

"Our pragmatic role is commercial, yet we are able to be slightly more experimental in our mission to adhere to green and sustainable practices," he says.

Perched on the waterfront, No. 1 Silo is an 18,600 sqm office building that has benefited from the use of sustainable resources and green construction principles from the outset. Highlights include electric car charging points and an ingenious system whereby heat generated from the IT server room is used to feed an underfloor heating system to warm the reception area.

Green says the building's energy efficiency, courtesy of the cooling system and facade, sets the Cape Town site apart from its peers.

"The typical No. 1 Silo office floor is performing approximately 50 per cent more efficiently than that of a standard office building," he says.

No. 1 Silo demonstrates what can be achieved when developers, designers and tenants work as a team. V&A Waterfront and main tenant Allan Gray originally set out to achieve a 4 Star rating for the building, but upped the ante as the project evolved. The result is a world-class sustainable building that also delivers a great indoor environment for the health and wellbeing of workers. 🌱



Melbourne Quarter

Creating the best places

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MODERN MARVEL

Edith Green-Wendell Wyatt
Federal Building, Portland, US

OFFICE BUILDING

GREEN CERTIFICATION: LEED PLATINUM

COST: US\$139 million (AU\$172 million)

COMPLETED: 2013

DEVELOPER: US General Services Administration

ARCHITECTS: SERA Architects; Cutler Anderson Architects; PLACE Studio (landscape architect)

BUILDER: Howard S. Wright Companies

Stepping into an elevator is an unusual way to help the environment, but that's the case in the Edith Green-Wendell Wyatt Federal Building, with six passenger elevators generating power as they descend. The elevators are among the many reasons that the modernisation of the building has received a raft of awards. Named the Best Tall Building in the Americas 2014 by the Council on Tall Buildings and Urban Habitat, the site is radically different from the original office tower built in 1974.

A stand-out in the US General Services Administration's (GSA) green building portfolio, the site's upgraded mechanical, electrical, plumbing and data systems make it one of the most energy-efficient

1208

SQM AREA OCCUPIED
BY SOLAR PANELS
ON THE ROOF

office buildings in the US. The project includes the conversion of a firing range into a 640,000-litre rainwater collection tank, while a solar roof produces 3 per cent of the building's yearly electrical energy needs. The building is expected to halve energy use compared with the old site.

Patrick Brunner, who oversaw construction for GSA, says the energy conservation outcomes and high tenant satisfaction are gratifying.

He concedes the greatest challenge regarding sustainability goals was making the switch from massive forced-air fans and vents to radiant heating and cooling. To cut the thermal load of the building and avoid overwhelming the new radiant system, shade devices were added to the facades, maximising daylight yet minimising solar heat gain.

The building is home to 16 federal agencies in Portland, Oregon. Other sustainable technologies it features include solar thermal panels that provide 30 per cent of the building's hot water, energy-efficient electric lighting systems, and smart fixtures that dramatically cut water usage.

Innovations aside, Brunner says an integrated delivery model and a great partnership between the major contractors contributed to the successful outcome. "We had a high-performing project team with a project-centric focus," he says.

He notes construction savings have funded a year of post-occupancy evaluation and optimisation.

"Importantly, the occupants had the opportunity to take an ownership stake in the facility and, by extension, help them be more productive in their new work home," he says.

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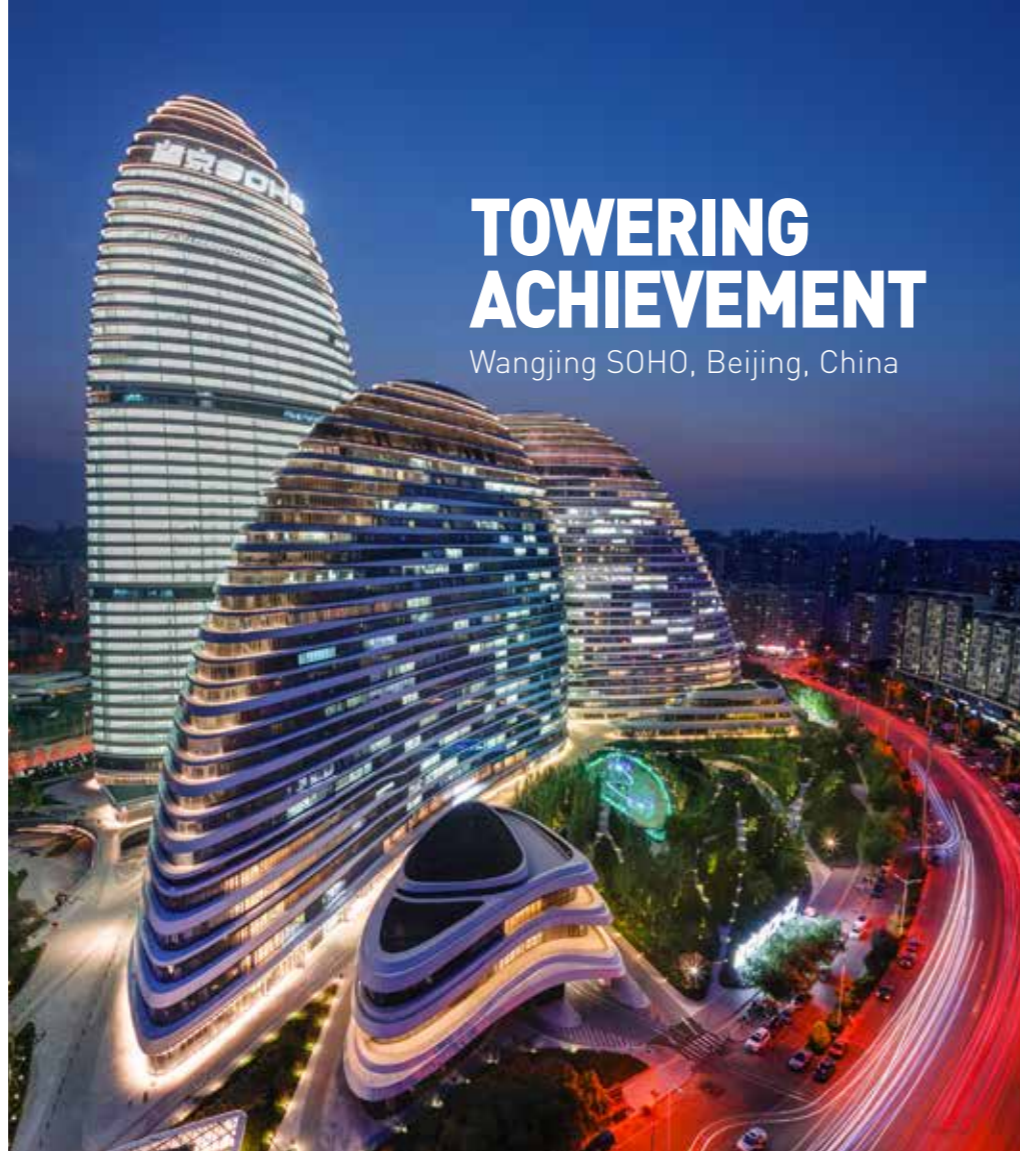
BELLFORT
COMMERCIAL INTERIOR DESIGN & FITOUT

World-renowned architect Zaha Hadid has incorporated three decades of personal design philosophy into the just-completed Wangjing SOHO building in Beijing. As always, she has made quite a statement.

For Hadid, design is all about achieving fluidity that creates visual simplicity and elegance, which builds complexity into a project without cluttering the scene. Wangjing SOHO fits that pattern in an area in north-east Beijing that has become a hub for Chinese and international IT and telecommunications corporations.

Offering mixed-use office and commercial buildings, the site features three sleek towers designed as interweaving 'mountains' that link the surrounding community

IMAGES: PAN SHIYI/SKY SOHO (EXTERIOR); VIRGILE SIMON BERTRAND (INTERIOR)



TOWERING ACHIEVEMENT

Wangjing SOHO, Beijing, China

MIXED-USE BUILDING

GREEN PRE-CERTIFICATION: LEED GOLD

COST: About RMB 3 billion (AU\$599 million)

COMPLETED: 2014

DEVELOPER: SOHO China

ARCHITECT: Zaha Hadid Architects

with a major new public park. With the tallest tower peaking at 200 metres, the stunning project is the main landmark to greet visitors when they travel from the airport to the city. The exterior skin of the towers looks like shimmering ribbons of aluminium and glass.

The 2004 Laureate of the Pritzker Architecture Prize and the first woman to win this award regarded as the 'Nobel prize of architecture', Hadid has created a highly energy- and water-efficient building in Wangjing SOHO. Natural ventilation, a high-performance glass curtain wall system and double-insulated glazing systems significantly cut heating and cooling needs.

The building is also equipped with a pure drinking water filtration

system that the developers claim meets the water standards for astronauts. Simulation tests indicate a 42 per cent reduction in annual potable water use and a 12.8 per cent reduction in energy costs for Wangjing SOHO compared with standard buildings. In addition, an air purification system kills bacteria and viruses and provides workers and visitors with fresh air.

At the opening of the stunning new construction, SOHO China chairman Pan Shiyi noted the company had, over the past 20 years, gone from introducing offices in "cookie-cutter form to delivering the streamlined, futuristic building of today".

He added, "All of our innovative efforts serve the one simple goal of making our work and life better."



CULTURAL ICON

Te Mirumiru, Kawakawa, New Zealand

EDUCATION BUILDING

GREEN STAR RATING: ★★★★★★

COST: NZ\$2.2 million (AU\$2.09 million)

COMPLETED: 2012

DEVELOPER: Ngati Hine Health Trust

ARCHITECT: Collingridge and Smith Architects

BUILDER: Howard Harnett Builders

MECHANICAL AND ELECTRICAL CONSULTANT:

Eco Design Consultants

ESD CONSULTANT: WSP | Parsons Brinckerhoff

The crowning architectural feature of the Te Mirumiru bilingual childcare centre in New Zealand is impossible to miss. A super-insulated earth roof covers the building and minimises heat loss from the site, which represents the culture and values of the local Ngati Hine tribe and its commitment to guardianship of the earth.

Te Mirumiru is New Zealand's first commercial earth bank building and the winner of the Asia Pacific Leadership in Green Building Awards for 2014.

Environmental design innovations include exposed concrete construction and natural ventilation, which enable passive cooling in summer. A solar hot water underfloor system provides any minimal heating backup that is needed in winter. All spaces in the centre are naturally lit during the day, while rainwater is captured on-site and used to irrigate the green roof. The result is a building that is 70 per cent more energy efficient than a similar code-compliant structure.

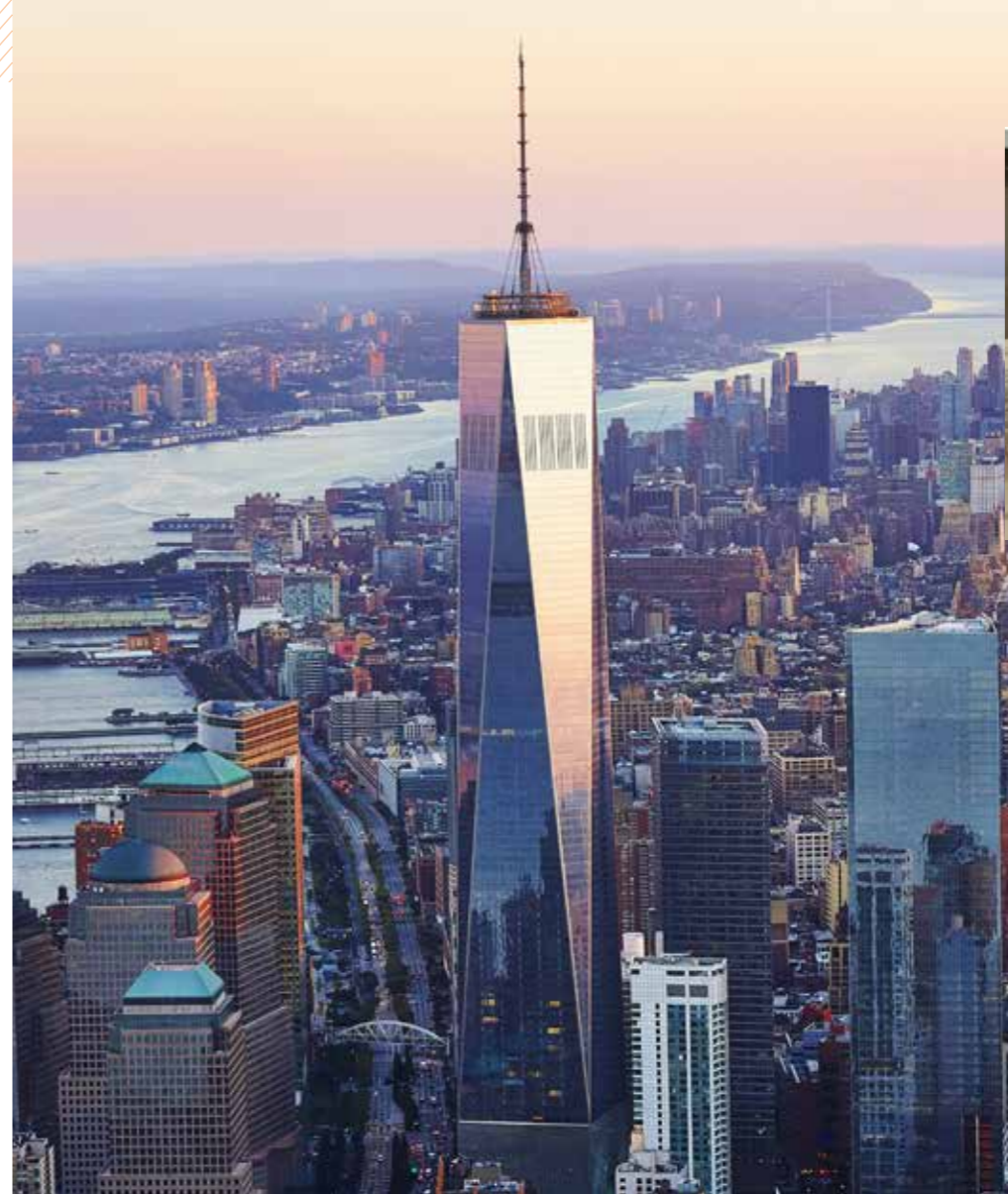
Phil Smith, a director at Collingridge and Smith Architects, says using the earth roof and

a surrounding bank "means the building can heat and cool itself far more effectively than by just using the concrete mass in the building". He adds, "It allows us to eliminate mechanical cooling, and mechanical heating is very minimal and controlled automatically by thermostats."

Smith says the integration of design, sustainability and cultural principles—the building's concept of *whenua*, which means both 'earth' and 'placenta' in Maori and is derived from the practice of burying the placenta of a newborn in the ground—is emotive for an early childhood centre and sets the project apart from many others.

As the only Green Star-rated early childhood centre in Australasia, the project, Smith believes, sets a standard for other sustainable designers to follow. He says his firm pursued a "pretty out-there concept" to excite people and attract publicity. With Te Mirumiru winning 11 awards to date, it has achieved that goal.

"I'd say to any client or architect wanting to achieve a similar result, you need to set out your vision from day one," Smith says.



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POWERFUL SYMBOL

One World Trade Center, New York City, US

OFFICE BUILDING

GREEN CERTIFICATION: LEED GOLD

COST: US\$3.9 billion (AU\$4.83 billion)

COMPLETED: 2014

DEVELOPERS: The Port Authority of New York & New Jersey; The Durst Organization

ARCHITECT: Skidmore, Owings & Merrill

MAIN CONTRACTOR: Tishman Construction

STRUCTURAL ENGINEER: WSP Cantor Seinuk

The new One World Trade Center building complements the adjacent memorial to the victims of the 9/11 terrorist attacks while representing the future of a resilient nation. This 104-storey tower designed in the tapering, triangular form of the Chrysler and Empire State buildings replaces a quarter of the office space lost in 2001.

One World Trade Center is among the most environmentally friendly buildings of its size. Its energy performance is expected to exceed building code requirements by 30 per cent; cooling systems use reclaimed rainwater; and waste steam helps to generate electricity.

Jordan Barowitz, a director at The Durst Organization, says one of

the big challenges was maximising light and views while making the curtain wall as energy efficient as possible, so oversized, low-iron, insulated glass panels were used to maximise 'daylighting'. "On sunny days, this triggers light-dimming devices that save energy," he says. "By maximising daylighting, you also increase the general wellbeing of the building's occupants, which can boost productivity and reduce absenteeism."

The tallest building in the Western Hemisphere at 541 metres, or 1776 feet—a reference to the year of American Independence—One World Trade Center's structure and interiors liberally use recycled materials. A wind farm and solar panels are located in the observation deck. Two massive storage tanks on the 57th floor collect rainwater to help operate other parts of the building. Even the toilets reflect a focus on sustainability, their shape increasing the velocity of flushing and requiring less water than regular flushing.

Barowitz says One World Trade Center drives home the message to property owners that they should let tenants and residents know how they directly benefit from building features that promote sustainability.

"Smart developers must help end users to understand that environmentally responsible buildings not only contribute to creating a greener and more sustainable earth, they also benefit tenants and residents by lowering costs, increasing comfort and creating a healthier work or living space."

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Red sway frames that zigzag along the side of 8 Chifley ensure Sydney's newest office landmark stands out.

Located in the heart of the city's legal and financial district, the 34-storey premium-grade commercial building includes a five-storey void and suspended glass foyer at street level that has created a new civic space in the CBD. The design complements the site's world-class sustainability features, with the building's carbon emissions expected to be about 75 per cent less than those of a typical Sydney CBD office building.

Designed by renowned UK architect Richard Rogers—the creator of masterpieces such as the Pompidou Centre in Paris and Lloyd's in London—8 Chifley comprises seven vertical villages.

Simon Healy, commercial development director at Mirvac, says the vertical villages are clearly one of the stand-out features of the site, linking a series of floors via a large central atrium and allowing for contiguous floor plates.

"This has become the catalyst for positive organisational change, including increased collaboration, interaction and visual connectivity," he says. "The vertical villages also allow for an abundance of natural light, minimising the need for artificial lighting."

Furthermore, the interconnected workplace encourages tenants to walk between floors, with the added benefits of reducing lift travel and improving the building's energy performance.

The building has a raft of sustainable features. A trigeneration plant generates low-carbon base building power to heat and cool the building and can also export power



to other sites at certain times of the year. An advanced blackwater treatment plant and chilled beam mechanical system are other highlights, while the latest building intelligence and monitoring systems add an innovative edge.

Healy acknowledges that close collaboration between Mirvac and the entire project team ensured that the overall quality of this highly complex project was not compromised.

"8 Chifley is a one-of-a-kind offering in the Sydney CBD and has become a flagship building in Mirvac's investment portfolio," he says.

CBD STAR

8 Chifley, Sydney, Australia

OFFICE BUILDING

GREEN STAR RATING: ★★★★★★

COST: Confidential

COMPLETED: 2013

OWNERS: Mirvac; Keppel REIT

DEVELOPER: Mirvac

DESIGNERS: Rogers Stirk Harbour; Lippmann

ADDITIONAL ARCHITECTS AND DESIGNERS: Arup (structure, sustainability)



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PIONEERING DESIGN

Living Planet Centre, Woking, UK

As far as green endorsements go, you couldn't possibly ask for a better advocate than Sir David Attenborough. The legendary documentary-maker and environmentalist opened WWF UK's Living Planet Centre in Woking, Surrey, describing it as a "fantastic eco-building that shows not only how it's possible to use our planet's resources wisely, but also helps us all connect with the natural world".

WWF's new headquarters, which has outstanding green and social sustainability credentials, features an Experience and Learning Zone where visitors, including schoolchildren, can discover more about the group's global conservation work.

Through clever design and the smart use of materials and technology, this state-of-the-art building has minimal impact on the environment. The 3600 sqm building sits on a raised concrete podium, its perimeter planted with shrubs, trees and flowers.

The two-storey site has an arched timber roof with photovoltaic panels that are expected to meet a fifth of the building's electricity requirements. Extensive use of glass maximises natural light, while a special lighting system means the installed lighting load is considerably lower than in a conventional office. Four specially designed recycled aluminium wind cowls provide natural ventilation.

Water management includes rainwater harvesting and recycling, while ground-source heat pumps heat and cool the building. Recycled materials figured prominently in construction and all wood came from responsibly managed forests.

In keeping with WWF's commitment to the environment, not even workers get a car space at the centre, which has an existing council car park under the building. The rationale? WWF wants to encourage staff to cycle to work or use the excellent public transport links instead. Sir David would approve. 🌱



OFFICE BUILDING

BREEAM RATING: OUTSTANDING

COST: £20 million (AU\$37.4 million)

COMPLETED: 2013

DEVELOPER: WWF UK

BUILDER: Willmott Dixon Construction

DESIGNER: Hopkins Architects

STRUCTURAL ENGINEER: Expedition Engineering

ENVIRONMENTAL DESIGN CONSULTANT: Atelier Ten

LANDSCAPE ARCHITECTURE: Grant Associates

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terraces on the facade. Vertical and horizontal sunshades on the facade will increase the energy efficiency of the building's air conditioning.

A solar chimney will provide natural ventilation of the basement car park, and a sophisticated solar hot water system will deliver heating for shower facilities in the complex. Other features, such as a daylight sun tube and light pipes, will be used to generate renewable energy and allow natural light into the interior of the building. A rainwater collection and storage system will facilitate landscape irrigation on the site.

According to Loic Menard, Dragages Hong Kong project director – Architectural Services Department, Trade and Industry Tower will be “an iconic addition to the Kai Tak skyline”.

“Its commitment to the highest standards of energy efficiency is the perfect complement to our own track record as the market leader in sustainable construction practices,” he says.

From gas-guzzling aircraft to smart and sustainable buildings, the transformation of the former Kai Tak Airport apron in Hong Kong continues as the new Trade and Industry Tower takes shape.

The 22-storey office tower in the Kai Tak Development Area is scheduled for completion this year and will provide new premises for government bureaus and departments, along with a community hall and car spaces.

The award-winning project is targeting LEED Gold certification by the US Green Building Council.

A distinctive ‘green ribbon’ will rise up the side of Trade and Industry Tower to the roof garden, courtesy of a series of vertical

TRADING UP

Trade and Industry Tower, Hong Kong

OFFICE BUILDING

PROVISIONAL ASSESSMENT: BEAM PLUS PLATINUM

COST: HK\$2.04 billion (AU\$325 million)
COMPLETED: Scheduled for 2015
OWNER: Architectural Services Department, the Government of HKSAR
ARCHITECT: Wong Tung & Partners
MAIN CONTRACTOR: Dragages Hong Kong
E&M CONSULTANT: Ove Arup & Partners
LANDSCAPE DESIGN: Urbis



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COMING SOON

CUTTING EDGE

52 Lime Street, London, UK

Dubbed 'The Scalpel' for its angular design, 52 Lime Street will take its place in London's prized financial district in a couple of years, sitting across from the famous Lloyd's building.

The commercial office tower will rise to 190 metres at its peak and have 35 floors of office space and mezzanine levels, plus two basement and two roof-plant levels. The top level will contribute to the building's sustainability story with a biodiverse green roof incorporating native wildflower species.

Construction has started on 52 Lime Street, which will be the new European headquarters for insurance company W.R. Berkley Corporation. It promises to be a stunning addition to the London skyline and has been awarded the first design stage certificate under the BREEAM UK New Construction 2014 scheme, which represents the

assessment body's latest and highest standard of sustainability.

With a design that limits solar gain and minimises the use of concrete where possible, 52 Lime Street will feature a large landscaped public space that includes opportunities for public art. From the outset, WRBC Development has insisted on creating an indoor environment of the highest quality to ensure the wellbeing of the building's users.

The group's managing director, Andrew Reynolds, says, "Our team is determined to deliver a high-performance building that is not only architecturally superb, but also creates a pleasant and productive environment for those who will be working there."

Collaboration between the architects, building engineers, facade engineers and client has been instrumental in forging a design that will deliver significant environmental benefits. An efficient mechanical design, a high-performance building envelope and low-energy lighting are expected to result in a 25 per cent operational carbon reduction for the building. A 45 per cent cut in potable water use compared with a typical tower is being targeted through the use of low-flush and low-flow sanitary ware.

The designers are also incorporating features that will give the building's users a chance to give back to the environment, with covered storage provided for about 370 bicycles to support sustainable commuting.



OFFICE BUILDING

BREEAM RATING: EXCELLENT (INTERIM STAGE)

COST: About £500 million (AU\$920.4 million)
SCHEDULED FOR COMPLETION: 2017
DEVELOPER: WRBC Development
DESIGNER: Kohn Pedersen Fox
BUILDER: Skanska
ENGINEER: Arup

COMING SOON



NEW HEIGHTS

Kuwait International Airport terminal, Kuwait City, Kuwait

PUBLIC BUILDING

NOT CERTIFIED YET

COST: Estimated at US\$3.2 billion (AU\$3.89 billion)
SCHEDULED FOR COMPLETION: Yet to be advised
DEVELOPER: Ministry of Public Works, Kuwait
ARCHITECT: Foster + Partners
STRUCTURAL ENGINEER: Arup
BUILDER: Yet to be named

When it gets off the ground, the new Kuwait International Airport terminal will set a benchmark for sustainability in airports around the world. Renowned international architecture firm Foster + Partners aims to make the new terminal the first LEED Gold-certified passenger terminal on the globe.

With the Ministry of Public Works in Kuwait determined to create a new regional air hub, the project will be impressive in design and scale. The new design features a trefoil plan of three symmetrical wings of departure gates, with each facade spanning 1.2 kilometres and extending from a 25-metre-high

central space. Glazed openings in the roof will filter daylight while deflecting direct solar radiation, and the roof will have a large expanse of photovoltaic panels to harvest solar energy.

Other clever green features will cut the building's energy use and keep it cool in one of the hottest inhabited places on earth. The building will have a single roof canopy that is supported by tapering concrete columns, with the designers commenting that "their fluid, organic forms draw inspiration from the contrast between the solidity of the stone and the shape and movement of Kuwait's traditional dhow sailing boats".

The concrete structure will also act as a thermal mass and the baggage reclaim area will be surrounded by cooling cascades of water. Landscaping will create a lush oasis outside the terminal.

The building contractor chosen to take on the project will have a big task ahead of them as the airport is expected to cater for 50 million passengers a year.



IMAGES: FOSTER + PARTNERS

COMING SOON

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ECO LIVING

Coco Palms, Singapore

RESIDENTIAL BUILDING

BCA GREEN MARK GOLDPLUS

COST: Confidential

SCHEDULED FOR COMPLETION: 2019

DEVELOPER: City Developments Limited

ARCHITECT: Axis Architects Planners

Future residents of Singapore's Coco Palms will feel as though they're living in a luxury beach resort once they settle into City Developments Limited's latest venture.

Fancy an onsen-style hydrotherapy bath, a dip in the saltwater pool or some exercise in the lap pool? That will all be possible. There will be six retail outlets on-site, as well as the three-storey Club Cocomo with its private function halls and activity spaces.

Coco Palms is not just about resort ambience, though. The site will have a long list of green attractions, including north-south orientation for most blocks as part of its passive cool design architecture; naturally ventilated lift lobbies; sun pipes to illuminate part of the basement car

park; electric vehicle charging points; a community garden and an Eco-Cube Farm to encourage resident gardening; and rainwater harvesting for landscape irrigation.

For Allen Ang, head of innovation and green building at CDL, these innovative outdoor features will define the development. "The community garden and Eco-Cube Farm are two green features that represent the smart use of space to facilitate community bonding and promote eco-awareness," he says.

"At the Eco-Cube Farm residents can grow fresh vegetables by utilising hygienic hydroponic technology that CDL pioneered in an earlier development. As Singapore relies heavily on imported food supplies due to the scarcity of land for farming, the Eco-Cube Farm will

define a new era of green buildings and sustainable living in the country."

There will be 944 residential units at Coco Palms when it is complete, and Ang says the design capitalises on prevailing wind directions and daylight "to improve the thermal comfort" of residents.

Ang says innovation is the key to enhancing sustainability. "But it must be cost-effective, help reduce the carbon footprint and bring about utility savings and a cleaner, greener living environment for our customers," he says. "The greatest challenge in developing sustainable buildings is to strike a harmonious balance."

With Coco Palms topping Singapore's bestselling residential development list in the first half of 2014, that challenge may already have been met. 🌱