

AUSGRID LEARNING CENTRE

IMAGE

Ausgrid Learning Centre
6 Star Green Star - Education Design v1
and As Built v1 Certified rating

PROJECT DATA

Owner

Ausgrid

Location

48 Holker Road, Silverwater, NSW

Size

17,800 square metres gross floor area

PROJECT TEAM

Main contractor

Brookfield Multiplex

Project manager

APP

Architect & principal design consultant

DEM

Interior Design, Landscape and ESD

DEM Landscape Architects and Interior Designers

Structural engineer

Taylor Lauder Bersten Engineers

Facade engineer

Arup

Civil engineer

C & M Consulting Engineers

BCA/PCA & OH&S consultant

Davis Langdon Australia

Access consultant

Accessibility Solutions

Acoustic engineer

Heggies Australia

Exhibition designer

Creative Concept Designs

Quantity surveyor

Altus Page Kirkland

The project at a glance:

- 6 Star Green Star – Education Design v1 and As Built v1
- Sustainability 'premium' of just 2.5 per cent
- Electricity use 60 per cent of comparable buildings
- 260 solar panels generating capacity of 51kW
- 337 kW tri-generation plant
- Ten electric vehicle charging stations

green building council australia



Education Design v1 2010

green building council australia



Education As Built v1 2011

Ausgrid's new Learning Centre combines world-class technical training for power workers with a cutting-edge green design.

The project has been awarded 6 Star Green Star – Education Design v1 and As Built v1 ratings, representing 'World Leadership' in sustainable design and construction.

According to George Maltabarow, Managing Director of Ausgrid, sustainability was always a key goal of the project. "From the outset, our aim was to develop a centre of excellence for training and research within a landmark green building," he says. "It needed to be a state-of-the-art facility to showcase energy efficiency and best practice sustainable design."

The 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.

A tri-generation plant produces enough electricity to power 50 houses for a year, as well as heating and cooling energy for the centre. To coincide with an electric vehicle trial, Ausgrid has included 10 electric vehicle charging stations at the Learning Centre. There are also 260 solar panels to generate renewable power. The centre includes live displays so visitors can monitor the centre's water and energy usage in real time.

However it's what you don't see that makes the Learning Centre so outstanding. One hundred-metre deep geothermal bores drilled into the site and ducted slab work cool the building, while indoor environment quality (IEQ) is high, providing staff and visitors with a healthy place to work and visit.

"Brookfield Multiplex is committed to being at the forefront of sustainable design and construction. At the Ausgrid Learning Centre, we pioneered the in-slab ducted cooling system which will deliver superior environmental performance to traditional air-conditioning options," says David Ghannoum, Regional Managing Director of Brookfield Multiplex.

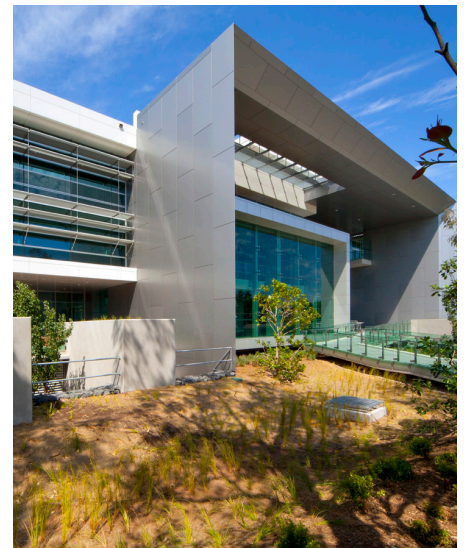
At the same time, energy efficiency measures are predicted to cut energy usage to 60 per cent of equivalent-sized buildings, slashing Ausgrid's energy costs by around \$60,000 each year. "The project is a living example of what we promote within the Energy Efficiency Centre," says Kate Gunton, Ausgrid's Property Manager. "It allows us to walk the talk when it comes to energy efficiency."

Best of all, the building's sustainability features were achieved with little impact on the budget. Gunton explains the building obtained cost estimates based on achieving each Green Star rating. "The green initiatives within the building had a cost of approximately 2.5 per cent of the total building cost and were required to achieve the 6 Star rating. A 5 Star rating would have seen a cost of approximately one per cent while a 4 Star rating would not have had any significant impact on the overall building cost. The 2.5 per cent premium was a worthwhile investment."

The main items which increased the cost were the solar panels and the trigeneration system, and both of these features were seen as important training aids for Ausgrid

apprentices. For other organisations targeting a Green Star rating, Gunton has some simple advice: "Ensure you have a team who has delivered on Green Star ratings previously."

Kate Gunton explains that Ausgrid used Green Star to assess the project because it aligned with the organisation's environmental principles and values. "Green Star offered us a clear and objective way to demonstrate our commitment to sustainability," she concludes.



WHAT THE AUSGRID LEARNING CENTRE ACHIEVED:

ENERGY

As a major electricity network operator, Ausgrid placed a premium focus on energy outcomes. "We strive to be a world leader in distributing electricity and providing energy services," Kate Gunton explains. "It was crucial for us that the Learning Centre demonstrated the ability to generate energy sustainably and reduce demand."

In line with this philosophy, a 51 kilowatt solar power system, made up of 260 PV cells, has been installed on the roof of the Learning Centre. When working at full capacity, the system will provide enough renewable energy to power 10 homes for a year and reduce demand on the network.

Complementing the solar power system is a 337 kilowatt tri-generation plant which acts as a mini onsite power station. The system uses gas to generate electricity, with waste heat used to warm the building and provide hot water. Heat from the generator is also directed to the absorption chiller which is used to cool the building. It allows Ausgrid to capture the energy in three different ways, resulting in high efficiency and less carbon emissions than coal-generated grid electricity. Plus it provides enough electricity to power 50 average homes for a year.

The project team didn't stop there. To further reduce waste heat from the absorption chiller, they drilled bores 100 metres into the earth. Water from the chiller is then directed down the holes where it is cooled by the earth's low temperatures before being pumped back into the system.

A focus on efficiency is another hallmark of the project, and one which is helping Ausgrid reduce CO2 emissions in line with sustainability goals. By installing energy-efficient lighting, heating and cooling equipment, as well as appliances,

the Learning Centre has reduced energy usage to 60 per cent of an equivalent-sized building. That's a saving of 600 MWh, reducing annual greenhouse gas emissions by 350 tonnes and saving Ausgrid \$60,000 on energy costs each year.

INDOOR ENVIRONMENT QUALITY (IEQ)

The Learning Centre provides a healthy, safe and comfortable place for staff to work and learn. The orientation of the building, combined with external louvers and awnings to provide shading, minimises both heat gain and glare. Further temperature control is provided by an in-slab duct system. The system features exposed concrete slabs, containing a metal ducted core, which absorb heat during the day and purges it by passing the cool night air through the slabs.

"The in-slab duct system has provided very comfortable working temperatures in the workshop areas which are not air conditioned," says Gunton.

Exposure to indoor irritants has also been minimised by specifying low-volatile organic compound (VOC) paints, adhesives, sealants, flooring, wood products and other furnishings for the fitout. According to Gunton, staff feedback on the building so far has been overwhelmingly positive. "The occupants of the building find it a great facility to work in. Staff visiting the building for training are all impressed with the quality of the facilities," she says.

WATER

The Learning Centre features a mixture of water efficient fixtures and fittings, as well as a rainwater capture system. These features, combined with the in-ground rainwater tank which can capture up to 147,000 litres of water, have reduced water consumption to half that of similar sized buildings. Cooling towers were avoided in the project's design and construction through the use of ground source heat rejection and dry air-cooled chillers, thereby eliminating potable water consumption by air conditioning.



MANAGEMENT

During construction of the Ausgrid Learning Centre, more than 95 per cent of demolition and construction waste generated onsite was recycled or reused, reducing the project environmental impact and landfill costs. Recycled bricks, timber and steel were used in the building while workstations and equipment were reused from other Ausgrid premises.

An independent commissioning agent worked with the facility management team, which resulted in a better commissioning process. "The benefit of managing the project this way is that building tuning after occupation has run smoothly," explains Gunton. "It has also enabled us to maximise the benefits of the green initiatives."

LAND USE AND ECOLOGY

Bioswales, which are channels filled with native plants to filter stormwater, have been used extensively around the site. Aside from removing pollutants from runoff before it reaches nearby watercourses, it has also created natural habitat in an otherwise industrial landscape.

The Learning Centre's green roof further reduces run off and has the added benefit of insulating the building below, making the electrical workshops, spray booths and offices much more comfortable. Green roofs also contribute to improving air quality and can reduce urban air temperatures by about two degrees in built-up areas.

MATERIALS

The project substantially reduced the CO2 emissions associated with the concrete used in the structure by reducing the cement content by an average of 45 per cent. Around 35 per cent of the aggregate used within the structure was blast furnace slag in order to reduce natural aggregates typically used in concrete. The steel within the structure utilised around 70 per cent recycled content to further reduce CO2 emissions associated with the used structure. Sustainable timber was used extensively within the project, combining FSC certified, reused and recycled timber for more than 99 per cent of all uses by cost.

