



# Business Energy Efficiency Program

Powering productivity | energy efficiency, smart business sense

## Case study **Bermark**

# Commercial building achieves four-star ABGR rating



A major energy audit and upgrade of a commercial building in Blacktown has resulted in significant improvements in energy use and management, with the building having achieved a four-star Australian Building Greenhouse Rating (ABGR) and a saving of 88 tonnes of greenhouse gas emissions a year.

“We’ve been very happy with the financial benefits we’ve achieved as a result of the energy-efficiency projects we’ve implemented,” said Simon Gastrell, Building Manager at Bermark.

“While the energy savings have been great, the value of having a four-star ABGR rating has surpassed the value of the energy savings. It’s one of the first things buyers will ask about when you’re selling or marketing a building, and it’s also valuable when you’re looking for tenants. Larger tenants in particular value greenhouse-friendly buildings, and some of them even use it as a selling point and incentive when trying to attract staff.”

NSW State Government policy means that the government will only lease space in greenhouse-friendly buildings. Bermark wanted premium NSW Government tenants for its commercial building at 125 Main Street, Blacktown - and the company was willing to lift its building’s greenhouse rating in order to attract them. That’s when Big Switch Projects entered the picture.

Backed by local power utility Integral Energy, Big Switch Projects undertook an energy audit of the building in early 2004, identifying a number of energy-efficiency opportunities. An initial ABGR was commissioned, resulting in a three-star ABGR rating.

Big Switch Projects was then asked to implement a number of its recommendations, including:

- Recommissioning the air conditioning system’s economy air cycle
- Voltage reduction units for base building lighting
- Installation of a new high-efficiency fan for one of the tenant’s data centres to replace the need of out-of-hours base building air-conditioning
- Power factor correction

<b>Client:</b>	Bermark
<b>Location:</b>	Blacktown, Sydney
<b>Completed:</b>	2005 and 2007
<b>Highlight:</b>	Achieving a four-star base building Australian Building Greenhouse Rating (ABGR)
<b>Scope of works:</b>	Recommissioning of the air conditioning system; installation of voltage reduction units for lighting and power factor correction; a high-efficiency fan to replace air-conditioning for tenant’s data centre
<b>Capital investment:</b>	\$31,570
<b>Annual Savings:</b>	2007: \$11,000
<b>Payback period:</b>	3 years
<b>Greenhouse gas emissions avoided:</b>	88 tonnes per annum

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The recommissioning of the air conditioning system's economy air cycle was particularly significant, as it now allows free cooling during mild weather, saving about 60 tonnes of greenhouse gas emissions per year. The economy air cycle had probably been decommissioned years earlier to reduce the cost of repairs. Old-style control systems and sensors are prone to "drifting" and are sometimes unreliable - a problem that has now been overcome with today's technology.

Lights in the common area lighting on the first and second floors were upgraded to tri-phosphor tubes matched to voltage reduction devices. This reduced the power consumption by around 28% without affecting the ambient light levels in the building.

A data centre on the ground floor of the building was the only area requiring after-hours air conditioning. This meant that one of the condenser water pumps, a ceiling-mounted air conditioning unit and the water tower were operating 24 hours/day, seven days/week to satisfy the load in a 15 square metres computer room.

To remove the need for after hours base air conditioning, a ceiling-mounted exhaust fan was installed to draw cool air from nearby office space through a door-mounted grille, and to exhaust warm air to a ceiling void. A power factor (PF) correction unit was installed to help the building attain a power factor of 0.98. This was a considerable improvement on the previous power factor of 0.85 at peak load, reducing peak demand by 23 kVA. This reduction has provided on-going savings in demand charges.

The projects were completed in late 2005. 12 months later, a second ABGR was commissioned, and in March 2007, 125 Main Street achieved a four-star ABGR rating. "The new rating highlighted the effectiveness of the upgrades undertaken at 125 Main Street," said Big Switch Projects' Manager, Business Strategy and Development, Tom Belsham. "It also shows how undertaking energy-efficiency measures can deliver much more than a reduction in energy and operating costs - it can also deliver meaningful competitive advantage."

Greenhouse gas emissions at 125 Main Street were reduced by 17%, a saving of more than 88 tonnes annually. The building's peak summer energy demand has been reduced by 28kVA, a 14% improvement - a good outcome for Integral Energy, which was trying to encourage demand reduction in the Blacktown area. With upfront capital costs of \$31,570, the projects implemented by Bermark have a payback period of 4 years and have reduced energy costs by 15%.

According to Mr Gastrell, the implementation of the energy efficiency measures was a win for all parties involved. "Joining with Integral Energy and Big Switch Projects provided us with the incentive to review our building, to see if there were ways we could cut energy use and reduce our operating costs and at the same time to improve our environmental performance," he said. "Most importantly, we have achieved a four-star ABGR rating without compromising the comfort of our tenants. We were prepared to invest in the future benefits by looking at our energy use now in preparation for rising energy costs"



Footnotes 1. Based on Australian Government Department of Climate Change guidelines that 1 kilowatt hour (kWh) is equivalent to 1.06 kilograms of greenhouse gas emissions in NSW - Department of Climate Change (2008), National Greenhouse Accounts (NGA) Factors, p16

Sydney Big Switch Projects  
Adelaide Big Switch Projects

Phone 02 8270 7777  
Phone 1300 55 77 27

Email [blacktownsolarcity@bigswitch.com.au](mailto:blacktownsolarcity@bigswitch.com.au)  
Email [adelaidesolarcity@bigswitch.com.au](mailto:adelaidesolarcity@bigswitch.com.au)

[www.bigswitch.com.au](http://www.bigswitch.com.au)