



The Szencorp Building

Second Year | Building Report

March 2008



szencorp
sustainable development



71%
energy
savings



94%*
water
savings

*Compared to the industry average, as measured by NABERS Water rating of 2.5 stars

Two Years On

Improved Performance, Improved Results

During 2004 and 2005, when Szencorp transformed what was an average 1987-built office block in South Melbourne into an environmentally cutting-edge space, comparatively less was known about the value of retrofitting inefficient commercial buildings.

A lot has changed in the past two years. The climate change debate has shifted from whether climate change exists, to how we can best address it. The enormous economic and environmental opportunity to retrofit commercial buildings is now well known.

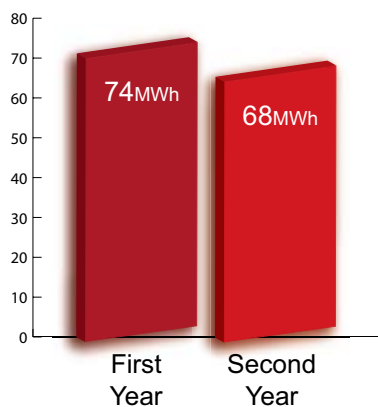
This report follows on from the First Year Building Performance Report and details the performance of the Szencorp Building in its second year of operation. These reports are intended to help others learn from Szencorp's experience, and make a contribution towards advancing the sustainable property industry.

Monitoring, verification and public reporting is the key to accountability. That's why the Szencorp Building has one of the most advanced and transparent building performance monitoring systems in Australia.

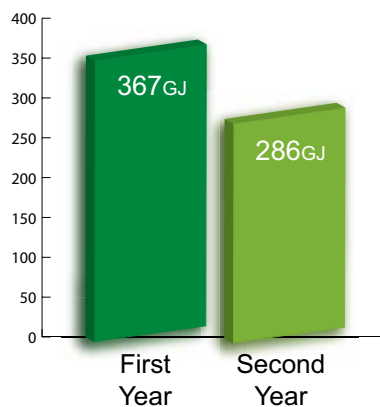
In-depth building reports and real-time building performance data is available to the public at www.ourgreenoffice.com.

The Szencorp Building's second year of operation was a substantial improvement on its already impressive first year results, creating energy savings of 71% and water use of 94% lower than the industry standard. This ongoing improvement is a result of careful monitoring and fine-tuning in the building.

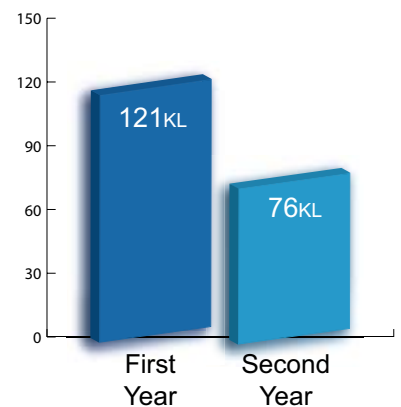
Electricity Consumption



Gas Consumption



Water Consumption





Ratings and the Second Year's Lessons

In 2005 the Szencorp Building was the first office refurbishment project to be awarded a 6 star Green Star Office Design v1 certified rating from the Green Building Council of Australia, which is the highest number of stars the council award and denotes 'world leadership'. This rating was achieved on the basis of the building's design. However the NABERS Water and NABERS Energy (formerly ABGR) ratings are based solely on performance and are based on a year's worth of water or energy bills.

Careful monitoring has been central to the building's ongoing achievement of the highest possible performance ratings in Australia. Since the Szencorp Building opened in October 2005, an abundance of real-time data on how the occupied

building functions has been collected to shed light on what actually works well in practice.

The value of monitoring is demonstrated by the building's water, gas and electricity usage improvements over both years of operation and goes to show even well-designed and well-performing systems can be improved upon significantly.

During the first year substantial efficiency gains were created, particularly in the early months when some teething problems were resolved. The second year has yielded further lessons and efficiency gains.

There have been a number of system changes instigated during the second

year operation in order to continuously improve performance. The improvements have been achieved through a number of measures including:

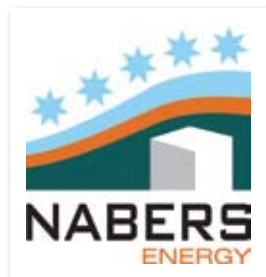
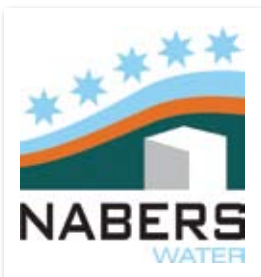
- HVAC system improvements
- installing additional PV arrays
- lighting and control upgrades
- BMS fine-tuning
- modifications to the domestic hot water and greywater systems.

For a more detailed exposition of building data and lessons learnt, the full Second Year Building Performance Report is available online at:

www.ourgreenoffice.com

PERFORMANCE RATINGS

5 Star NABERS Water
5 Star NABERS Energy



DESIGN RATING

6 Star Green Star Office Design



Energy Use

Total electricity use for the second year is **68 MWh**. This is a **71%** reduction on the **238 MWh** previously used in the building. This equates to a per square metre improvement of **76 kWh/m²/annum** down from **196 kWh/m²/annum** in the first year of operation.

Overall gas consumption of **286 GJ** is a 22% improvement on the first year's gas consumption.

NABERS Energy (formerly Australian Building Greenhouse Rating, ABGR) normalised carbon dioxide emissions

were **164 kWh/m²**. This figure passes the benchmark for a 5 Star rating.

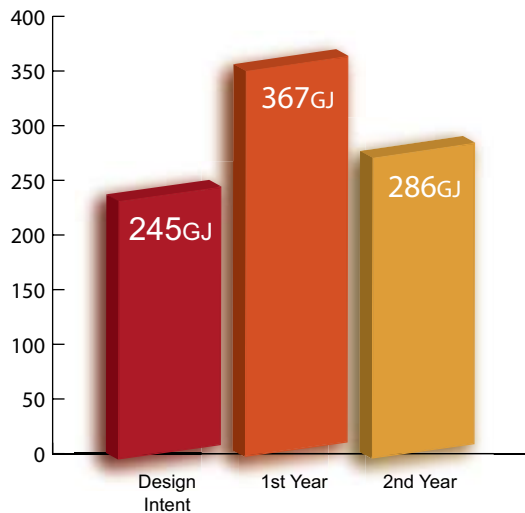
100% green power is purchased for the Building's electricity requirement, and carbon credits are purchased to offset the CO₂ emissions from gas use and staff transport through offsetting company Climate Friendly.

Including green power in calculations would immediately deliver a 5 Star NABERS Energy rating but this would not assist to understand the energy efficiency performance of the building,

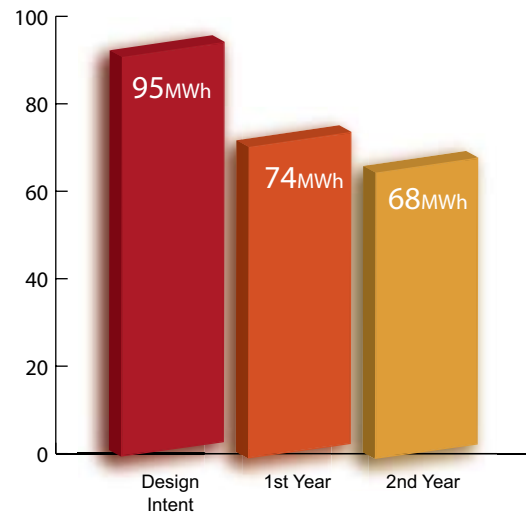
so calculations in this report assume no green power or offset purchase.

The many lessons and recommended improvements from this work are fully detailed in reports found at: www.ourgreenoffice.com.

Gas Consumption



Electricity Consumption



Water Use

Total normalised water use for the second year is **76 kilolitres** or **101 litres/m²/annum**, which is **94%** below the industry average.

This result is substantially less than the **350 litres/m²/annum** benchmark required to achieve a NABERS Water 5-Star rating.

The Szencorp Building was designed to achieve an **82%** reduction in water use compared to the industry average of **1,175 litres/m²/annum** (equivalent to a 2.5-star NABERS Water rating).

In the second year of operation 9kL less rainwater and greywater was collected compared to the first year. Rainwater and

greywater are used to flush the toilets in the building, hence an additional 8kL of mains water was needed to top up the toilet flushing tanks.

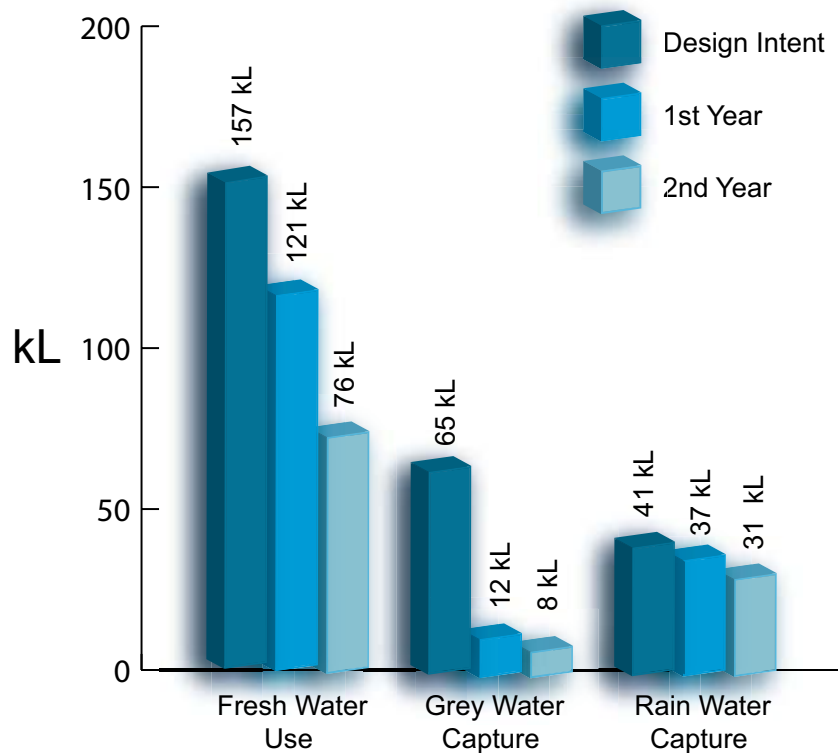
Rainfall captured by the building fell by 6kL down to 31kL. Grey water capture fell 4kL down to 8kL due to a period of failure in the old greywater system and the installation work associated with the new system.

Building plumbing only allows water from handbasins in the female toilets to be diverted for greywater treatment. Fewer female staff compared to male staff has reduced the amount of greywater collected.

The 76kL second year result is a **51%** improvement on the design intent of the building and is a substantial improvement over the 121kL used in the first year of operation. Water savings were improved because:

- Taps and showerheads were audited to ensure full compliance with their design specifications
- The greywater system was found not to be performing correctly, causing more mains water to be used than necessary. As a result the old system was replaced with a new Nubian greywater system.

Water Consumption



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Other Aspects of Building Performance

It goes without saying that a building's performance is more than just its energy and water usage. During the Szencorp Building's first year of operation as a green building, several key areas of building performance were studied in detail.

Reports were carried out by external experts on:

- Indoor environment quality (IEQ)
- Occupant productivity
- Occupant satisfaction
- Waste
- Transport

The results of these studies are available online at www.ourgreenoffice.com.

It is intended that further reporting on some of these aspects of building performance will be carried out in the future, particularly to see whether initial improvements have been sustained.

External Studies Undertaken at the Szencorp Building

AREA OF BUILDING PERFORMANCE	KEY FINDINGS
Indoor environment quality (IEQ)	The Szencorp Building's internal air quality is equivalent to rural air
Occupant productivity	Reported overall productivity increase of 13%
Occupant satisfaction	Comfort, overall design and health were all rated above average
Waste	Waste generated is 94kg per year per staff member, 54% lower than the established benchmark of 173kg per person per year for commercial buildings
Transport	77% of employees drive a car or motorcycle to work, 18% take public transport and 5% cycle



Next Steps

Despite an impressive track record, the Szencorp Building is still aiming for ever-improving efficiency and system optimisation. Szencorp believes that credible, ongoing performance results are essential and that buildings should be judged on their performance, not just on their design intent.

The Szencorp Building continues to attract interest nationally and internationally. The building's ongoing achievements have put Szencorp on the map as a company dedicated to sustainability with expertise in property development, energy efficiency and water conservation.

Szencorp is continuing its mission to retrofit commercial buildings to make them efficient and has a number of projects underway, in Australia and overseas.



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40 Albert Road, South Melbourne
Victoria 3205, Australia

+61 3 8807 4666
www.ourgreenoffice.com
info@szencorp.net

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