

## SKYCITY – reaching new heights in efficient hot water use

The glitz and glamour of Auckland's SKYCITY belie the practical steps being adopted at the entertainment complex to make energy efficient improvements and reduce its environmental impact. Key amongst these have been innovations to the way the hot water is supplied and used, which have provided significant savings.

### About SKYCITY

For most New Zealanders, Auckland's SKYCITY needs little introduction. At 328 metres, its Sky Tower is our tallest structure, forming a distinctive silhouette on the city skyline. Visitors (up to 750,000 every year) enjoy the tower's impressive 360 degree views across Auckland, walk around its pergola, or even leap off it – base-jumping by wire from 192 metres up.

Beneath the Sky Tower is a large entertainment centre, featuring a casino, 18 restaurants and bars, two hotels totalling 656 guest rooms, a theatre and a day spa.

### Focusing on sustainability

SKYCITY's interest in environmental issues and energy efficiency is driven by a desire not only to make savings but also to enhance the SKYCITY brand. The company stepped up its activities on sustainability in 2007 with the appointment of an environmental engineer as Energy and Environment Coordinator, greatly increasing SKYCITY's ability to plan and implement significant energy efficiency projects. This included a closer look at improving the efficiency of hot water use, and a major project to reduce gas heating costs through a solar water heating installation, completed in early 2010.

### Cutting hot water use while maintaining comfort

SKYCITY first looked to address the demand side of hot water use. As showers make up a very large portion of a hotel's water consumption, reductions in this area can make a big impact, especially in Auckland City, where water is metered and charged for. It was a priority, however, to make sure guests remained happy with the quality of their shower. In 2009 a variety of efficient showerheads were trialled in SKYCITY hotel rooms. Methven's Genesis range proved the most successful in meeting customer demand for shower comfort while also reducing water use. Consequently these showerheads are being installed during the 2010 financial year. The project is costed at \$70,000 but savings of an estimated \$79,000 per annum are expected, not just on unused water, but also on the electricity and gas no longer required to pump and heat that water.

Staff training also bore worthwhile dividends; educating hotel housekeepers and cleaners on better water use has reduced wastage by 12.5% at the Grand Hotel alone. Cleaners, chefs and stewards are now taught to run water only as needed, and the building wash-down team has been equipped with trigger-activated hoses. Regular use of the pool cover on the hotel swimming pool is expected to save \$10,000 a year.

### Harnessing the power of the sun

The complex's solar installation comprises 22 full-sized solar collectors located on the roof of the hotel, covering an area of 61 square metres. Sun-heated water is pumped from the collectors on the roof down 11 floors to a heat exchanger in the parking level underneath the hotel, where the heat is transferred into the cold water entering the system.

The 'pre-heated' water then gets a boost from gas boilers to heat it to the required 65°C before it is used to supply all the large kitchens, restaurants and bathrooms on the casino's gaming floor.



The solar collectors on the top of the hotel roof can be seen from the Sky Tower.

#### ✓ Key features

- 22 full-sized solar collectors supplying heated water to a heat exchanger
- Real-time monitoring, animation and reporting tool for solar heating
- Efficient showerheads tested to find best solution for savings and comfort

#### ✓ Key benefits

- \$7,000 - 8,000 annual savings on gas by using a solar energy pre-heat system
- An estimated \$79,000 savings from switching to efficient showerheads
- Enhancing the SKYCITY brand by showcasing its energy efficiency initiatives

#### ✓ Sector relevance

- Hotel/accommodation industry
- Hospitality industry



SKYCITY's need for constant hot water meant it was possible to use a heat exchange system and avoid the need for large hot water storage tanks, which are typically one of the most expensive components of a solar water heating system. The system was designed by Energy Conscious Design, with conceptualisation and feasibility studies by Project Solar. Energy Conscious Design also implemented a unique web-based "Solar Monitor" ([ecosolar.co.nz/skycity](http://ecosolar.co.nz/skycity)), which offers a real-time monitoring, animation and reporting tool.

The system is expected to save as much as \$8,000 in gas bills each year, but further value comes from the opportunity to showcase SKYCITY's energy efficiency investment to the public and build its brand as a company with a commitment to the environment. Visitors can view the solar collectors from the top of the Sky Tower, and watch a short video about how the solar water heating system works, alongside real-time monitoring of the system's performance, as well as other information about SKYCITY's sustainability initiatives.

Altogether the project cost just over \$140,000, with EECA providing around half of the cost through an Innovation Fund, which ran in 2007 and 2008. With the infrastructure in place for preheating the cold water supply, additional projects are possible, to cost-effectively use the additional capacity of the heat exchanger. This could include extending the solar collector array on an adjacent roof, or recovering waste heat from the ventilation system using a heat pump water heater.

### Challenges and next steps

Savings from hot water efficiency and lighting improvements have helped SKYCITY reduce its utilities bill by nearly 10%.

Next steps include energy efficiency improvements to air conditioning and ventilation, water usage and waste disposal.

SKYCITY's management is very pleased with the success of the efficiency projects so far, though Jonathan Woodbridge Buys, SKYCITY's Energy and Environment Coordinator, notes that this does raise a small issue: "The only problem with getting returns on projects is that it can create high expectations for the next project!"

### Key personnel

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### SKYCITY's perspective

**Matt Howells,**

**Facilities Manager:**

The business case for SKYCITY is about more than just direct savings, says Matt Howells, SKYCITY's Facilities Manager.

"A project like this has to make business sense. Part of that business case is the direct cost savings we can make, and given the amount of hot water the building uses, the investment in efficiency will pay itself off quickly. "The other part of the business case is about the SKYCITY brand. We are committed to environmental sustainability and that means putting our money where our mouth is."



**Simon Jamieson, General Manager:**

Simon Jamieson, the General Manager of SKYCITY Group Hotels, says the project is part of SKYCITY's overall sustainability strategy.

"This solar installation will be seen by up to three quarters of a million Sky Tower visitors every year. We hope that will inspire them to think about changes they can make in their own lives that will reduce energy use for the good of the planet."

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