CASE STUDY

PARKROYAL SURFERS PARADISE

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Introduction

A hotels energy use benchmarking project, a partnership between the Commonwealth's Energy Efficiency Best Practice (EEBP) program and the Australian Hotels Association, has shown how hotels can maximise profits, minimise energy costs and demonstrate leadership by reducing energy use and greenhouse gas emissions—without negatively impacting on the comfort or satisfaction of their guests and customers.

During the project, energy use data was collected from around 50 hotels across Australia and then six of the better performing hotels were examined in depth. The results of the benchmarking exercise have been well documented in a report and series of case studies. This case study is on the Parkroyal Surfers Paradise in Queensland.

Parkroyal Surfers Paradise

The Parkroyal Surfers Paradise is a 379–room, 49 124m^2 hotel, which has two towers and a total of 48 floors (22 in the North Tower and 26 in the South Tower). Located in the Gold Coast's humid, subtropical climate, the resort's energy demand is largely driven by the need to provide cooling in guest rooms—the hotel requires little heating.

The hotel has been reaping the benefits of energy efficiency since its construction in 1990. However, it is only over the last four years that the hotel has instituted a formal environmental policy to ensure that energy and conservation get the priority they deserve.

David Craven, Director of Engineering, is responsible for implementing energy management and preventative maintenance programs in the hotel. 'A systemic approach is key', says David. 'We always replace equipment at the end of its life with the most efficient model available. For instance, when the gas water heating system in the South Tower reached the end of its life, we replaced the 16–manifolded heaters with a single more efficient boiler. This reduced our gas consumption by 10 per cent.'

'Good housekeeping lets me keep my finger on the pulse. I monitor the hotel's maximum power demand and total energy demand daily. Only recently I noticed a large increase in electricity use and found a failed chilled water valve.'

'Refurbishments are also a good time to install efficient equipment', says David. 'In 1999, we installed a Building Management System on air-handling units which saves more than $5 000 a year.'

Key energy efficiency investments and savings

Item	Capital cost	kWh energy savings p.a.	Energy cost savings p.a.
BMS control of AHU	$30 000	75 600	$5 292
Pool solar water heater	$18 000	42 000	$4 521
No heating of larger pool during winter	$1 000	197 100	$16 320
Gas boiler for domestic hot water	$68 000	105 120	$8 704
Efficient compact fluorescent lights	$4 548	109 500	$7 665
Efficient halogen lighting	$1 740	20 360	$1 425
Metal halide—external lighting	$5 000	32 850	$2 299
Efficient lights for conference rooms	$1 200	21 900	$1 533
Total	$129 448	604 430	$47 759

Management system initiatives

- Establishment of an Environmental Management Committee.
- Energy saving initiatives funded through the operational budget.
- All energy efficiency initiatives evaluated using cost benefit analysis prior to approval.
- Partnering with the hotel's chiller supplier to test a new control method that aims to improve performance by 10 per cent.
- Greenhouse gas reduction targets developed as part of the hotel environmental policy.
- Guests encouraged to save energy by turning off lights and television.
- Housekeeping staff turn off lighting and air-conditioning after room servicing.

Key outcomes of energy efficiency investment

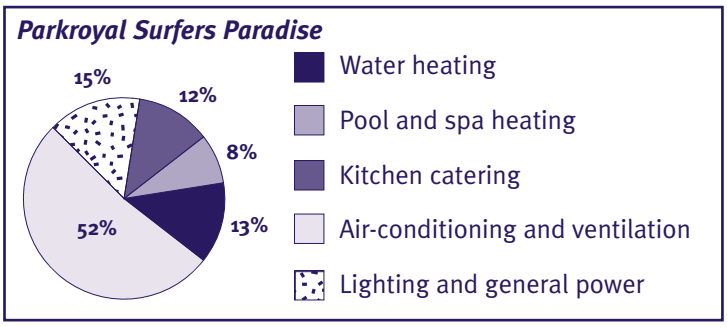
Capital investment: $129 448
Energy savings: 604 430 kWh p.a.
Energy operational savings: $47 759 p.a.
Greenhouse Gas savings: 334 tonnes CO2 p.a.
Return on capital invested in efficiency using energy savings: 37%
Net Present Value: $163 973 (discount rate 10%, life 10 years)
Energy benchmarks: 792.3 MJ per square metre
Energy use—industry average for an accommodation hotel: 700 to 800 MJ per square metre

Energy planning goals for 2001

1. Establish an integrated Building Management System (BMS) and Energy Management System.
2. Install additional BMS points on South Tower to enable monitoring of the main chiller plant.
3. Install timers to control hotel corridor lighting in North Tower.
4. Evaluate cost effectiveness of carbon monoxide monitoring.
5. Start in-house energy-auditing program.
6. Increase efficiency of North Tower chiller from COP 5 to 5.5.
7. Implement additional programming to reduce chiller plant operation by closely monitoring primary cooling water temperature and condenser water temperature.

Key energy use areas

Total annual energy use for the year 2000 was 38 919 157 MJ. A breakdown of usage into key service areas indicates that air-conditioning, pool heating, hot water and lighting are the hotel's primary energy drivers.



Energy use in service areas by percentage

Key efficiency initiatives

Initiatives incorporated during building construction

1. Air-conditioning door switches fitted on guest room balcony doors, to turn off room air-handling unit when doors are open.
2. Energy efficient, award-winning, centrifugal chiller installed in the North Tower.
3. Gas connected for water heating, pool heating and space heating.
4. Fluorescent lamps used for bathroom vanity units lighting.

Lighting initiatives since construction

1. 348 50 Watt lamps in guest bathrooms replaced with efficient 20 Watt dichroic lamps.
2. Compact fluorescent lights installed in guest area corridors.
3. 80 150 Watt PAR 30 lamps in conference rooms replaced with 75 Watt lamps.

Building Management System controls

1. In 1999, a disused energy management system was removed and the BMS was extended to control hotel common area lighting and air-handling units.
2. Digital controls installed to replace the failing pneumatic control units. This increases the BMS's control of the air-handling units and reduces operating costs.

Water heating

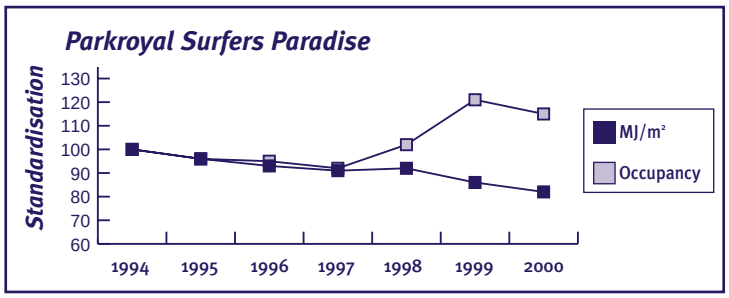
In 1999, a new central gas hot water boiler system was installed at a cost of just over $68 000. This eliminated the need for 16 individual gas storage water heaters and is saving more than $8 700 per year.

Pool heating

The hotel has two pools with capacities of 150 000 and 470 000 litres respectively. The larger pool is heated by a solar heating system with a gas booster. The smaller pool is heated by a natural gas heater. The hotel recently decided to heat only the smaller pool year round. In the winter months, guests are directed to that pool. The capital cost of signage to inform guests was only $1 000. Total energy savings, however, are more than $16 000 per year.

Overall hotel performance

The energy performance for the Parkroyal Surfers Paradise for the years 1994 to 2000 is charted below. The chart shows a downward trend of the total energy used per square metre.



More information

The hotels energy use benchmarking project concluded that best practice hotels always have systems in place to regularly monitor, record, analyse and report on hot water, gas and electricity use. They often have full time engineers on site and continually seek ways to optimise energy performance. Best practice hotels also understand the importance of incorporating efficiencies into day-to-day operations and into the planning of renovations and retrofits.

EEBP supports industry sectors to identify and implement cost-effective solutions for a more sustainable and competitive future. The program has a combined focus on innovation, training and benchmarking and offers practical tools, information and assistance. EEBP is working with a growing list of industry sectors, which includes aluminium production, beverage and containers manufacturing, bread baking and milling, dairy processing, wine making, and fleet management.

The hotel benchmarking case studies are available without charge from:

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