



CASE STUDY



ACHIEVING RESULTS IN THE BREAD BAKING SECTOR

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BAKERS DELIGHT ENERGY EFFICIENT SHOWCASE BAKERY

Savings are on the rise at a showcase bakery in the suburb of Mascot in Sydney, after an innovative project has proven that energy efficiency best practice really produces the goods.

A working demonstration of best practice building design, baking practices and equipment efficiency, the bakery was designed and developed by Bakers Delight in partnership with industry suppliers and the Energy Efficiency Best Practice (EEBP) program of the Commonwealth Department of Industry, Tourism and Resources.

The overall aim of the partnership was to establish ways to minimise and better manage energy use within a shopfront bakery, without impacting on quality of the products, customer satisfaction or staff comfort. Several initiatives were developed through the partnership, including:

1. Designing and building an energy efficient Showcase Bakery to test, demonstrate and set best practice benchmarks for building fit out, baking practices and equipment efficiency;
2. Rolling out opportunities by incorporating energy efficient practices into the quality assessment system for every Bakers Delight bakery; and
3. Training Bakers Delight franchisees, managers and staff on energy efficiency best practice.

While the Energy Efficient Showcase Bakery, launched in June 2002, looks much the same as any other Bakers Delight bakery, behind the scenes improvements in building fit out, baking practices and equipment have significantly reduced energy use and lowered greenhouse gas emissions—in some cases by amounts that are higher than initially believed possible.

To date, the project has achieved 32% savings in annual energy costs and a reduction of 48 per cent in greenhouse gas emissions per year compared to a standard Bakers Delight bakery. The project also led to improvements in waste minimisation, water conservation and purchasing energy from renewable sources.

The Showcase Bakery is a working demonstration of how best practice and innovation helps test new concepts and technologies, pushing the organisation beyond current normal practice. The knowledge, expertise and lessons learned through the experience are now starting to be applied across Bakers Delight's franchise network of more than 650 bakeries and communicated throughout the baking industry.



INDUSTRY
TOURISM
RESOURCES
COMPETITIVE
AUSTRALIA



energy efficiency
best practice



‘Learning about and maximising energy efficiency is good business and what we have learned will be important as we continue to build our business, said David Bayes, CEO of Bakers Delight.

This case study details the Bakers Delight experience.

THE BIG ENERGY PROJECT (BEP) PROCESS

The design process for the energy efficient Showcase Bakery began with an EEBP Big Energy Project (BEP)—an innovation-based methodology in which the energy intensive processes within the bakery are identified and investigated with the aim of making significant improvements in energy performance.

The BEP process brings key company staff and external technology specialists together to develop a whole-of-system understanding of the issues at hand (for example, comparing current energy use to ideal energy use), as the basis for jointly developing new and innovative solutions.

With Bakers Delight, the team drew on the experience of employees, equipment suppliers, other representatives from the company’s network, external specialists with knowledge of specific technologies (including specialists in baking and energy efficiency) and representatives of EEBP.

‘The team approach was essential,’ says Stuart Macfarlane, Managing Director of Bettacool, suppliers of refrigeration equipment. ‘The presence of an independent body like EEBP and other consultants was very important to the success of the project. They were not driven primarily by the commercial end, but rather what could really be achieved.’

Flexible in approach, a BEP typically begins with research and the collection of energy data, which leads to the development of an extensive and detailed background paper by an external consultant. The Bakers Delight paper detailed the breakdown of energy use in a standard bakery, outlining the end-use of energy for equipment and building services and identifying areas of opportunity for substantial energy savings.

In line with the overall BEP process, the team participated in an intensive, facilitated innovation workshop, drawing on the contents of the background paper and the experience and knowledge of participants, to generate ideas for achieving ‘big-step’ improvements in energy use.

The workshop taught participants a great deal about patterns of energy consumption, refined or corrected assumptions and revealed opportunities for improvements. Participants discovered, for example, that:

- while ovens are the highest energy users, consuming over half (55 per cent) of the total store use in a typical bakery, they do not consume as much as initially thought (80 per cent)
- every hour that an empty oven is operating, approximately 10 kWh of energy is lost through the walls and doors

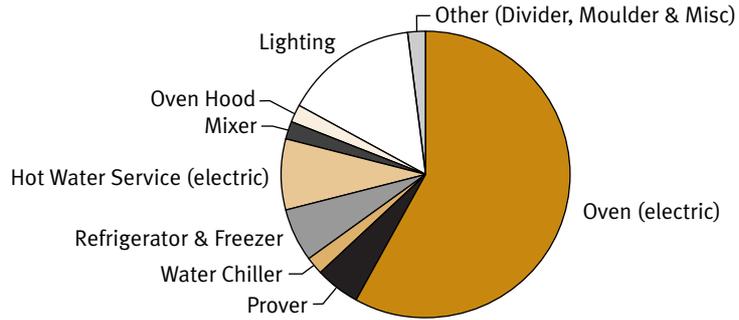
Energy monitoring, at a Bakers Delight bakery in Melbourne, also took place during the project, providing additional insight into energy use. A breakdown of energy consumption at this bakery is illustrated in Figure 1.

At the end of the BEP workshop, team members had identified more than 16 areas for improvement in energy performance, including oven efficiency, refrigeration and hot water supply. They also identified other environmental practices requiring attention, such as waste minimisation, water conservation and purchasing energy from renewable sources.



Mr David Bayes, CEO, Bakers Delight at the launch of the Bakers Delight Energy Efficiency Showcase Bakery, Mascot.

Figure 1: All electric bakery—typical annual energy breakdown (excluding air conditioning)



BUILDING THE SHOWCASE BAKERY

Following an exhaustive search for the perfect location, the Mascot site was selected for one very practical reason—electricity supply to the site was well below that required for a standard Bakers Delight bakery. To build a standard bakery at this site would require an upgrade of the electricity supply for the entire street. The challenge to substantially reduce consumption therefore had very immediate consequences.

Construction of the bakery began in May 2002 and, as in most construction projects, improvements and changes to the plans for the bakery continued throughout the building phase. For example, the role of the Showcase Bakery as a testing facility provided an opportunity for the project team to install and test the performance of a gas oven, in addition to the energy efficient electric oven. The team agreed to include a gas oven although, due to time constraints, some of the improvements made to the prototype electric oven could not be included in the gas version.

OVERALL RESULTS

The Showcase Bakery was launched on 21 June 2002. During the first 12 months of operation, permanent energy monitoring equipment has been installed within the bakery. The data collected tells an impressive story about the energy savings that are being achieved:

- 32 per cent savings in operational energy costs per year
- lowering greenhouse gas emissions by 48 per cent per year
- significant energy savings from individual pieces of equipment (see below for further details)

Figure 2: Annual energy cost

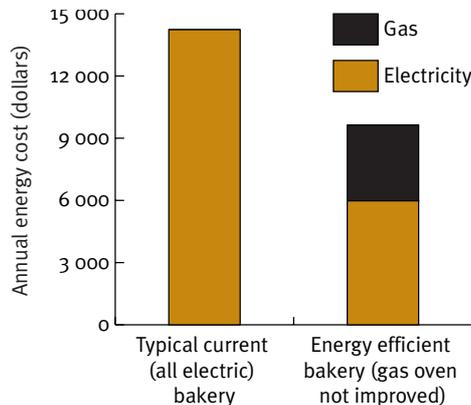
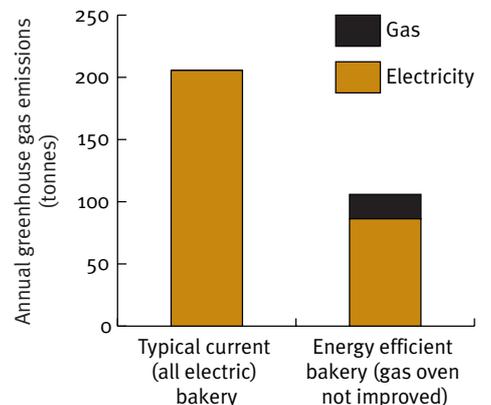


Figure 3: Annual greenhouse gas emissions



SPECIFIC IMPROVEMENTS AND RESULTS

A complete list of the innovations introduced in the Showcase Bakery can be found on the attached table of improvements. Several have achieved substantial energy savings and greenhouse gas emission reductions.

Ovens—20 % energy cost savings

The electric oven designed through the Big Energy Project incorporates several key changes that resulted in substantial savings.

- fully insulated solid doors with no glass window
- improved insulation in walls, between decks, and in the main drive shaft
- an energy efficient light that switches on when the door is opened
- seals attached to all four sides of the doors
- individual programmable temperature and time controls for each deck

The gas oven installed in the bakery did not include all of the design improvements featured in the prototype electric oven. If all of the design improvements were incorporated in the specification for the gas oven, the appliance would consume less than half of the gas currently consumed, leading to 20 per cent additional annual energy cost savings.

Oven Hood—74% energy cost savings

Improvements were made to the design of the oven hood and adjustable variable speed drives were fitted on supply and exhaust fan motors. Motors now run on low speed until a light beam detector indicates that one of the oven doors is opened, when the motors switch to high speed. Back draft dampers have been installed in the ceiling space to prevent the infiltration or loss of conditioned air when the fans are switched off.

Lighting—64% energy cost savings

Improvements to lighting innovations reduced the lighting power from 3.4 to 1.5 kW while maintaining the lighting levels similar to those found in a standard Bakers Delight bakery. The lighting system, which includes both high-efficiency T5 fluorescent lamps and 35W metal halide lamps, is split into two circuits—one being small enough to provide safe access when the bakery is not operational.

Prover—35% energy cost savings

A prover in a standard Bakers Delight bakery holds up to five racks in a single compartment with one door and one heating and humidifying system. The prototype system installed at the Showcase Bakery includes two prover cabinets, one with two sealed doors, each holding one rack, and the other with three sealed doors, each holding one rack. Each of the cabinets has an independent heating and humidifying system. This innovative design reduces heat and energy loss as bakers only remove single racks. It also allows bakers to use only the necessary proving capacity and avoids wear on the cabinet floor as bakers no longer need to enter the prover to shuffle and remove racks.

Other Equipment

Other energy saving measures undertaken at the Showcase Bakery include the installation of an instantaneous gas hot water system with the highest energy rating (80% energy cost savings). Sink sizes and pipe lengths have been minimised and insulated, hand basins have flow reduction taps, and a rainwater tank supplies water to a dual flush, water conserving toilet. Reverse cycle split system air conditioners have been installed in the baking and sales areas, enabling local manual control.

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BAKERS DELIGHT ENERGY EFFICIENCY SHOWCASE BAKERY

Some key initiatives:

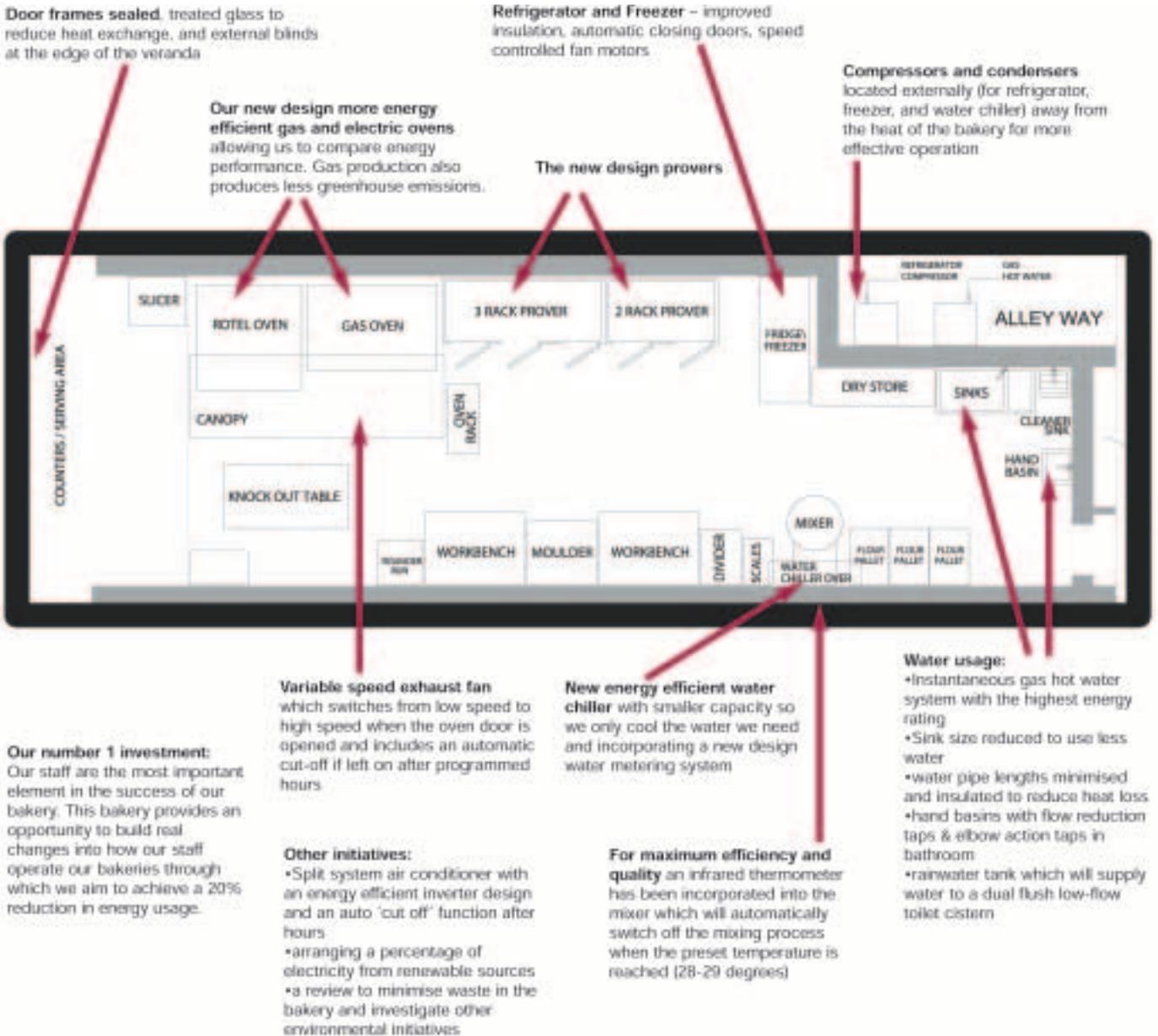


Diagram provided courtesy of Bakers Delight.

INVOLVING STAFF IN THE PROJECT

In addition to physical changes, the bakery is investing in improving operational practices. Staff are continually considering and trialling new methods of working to reduce total energy use, for example:

- minimising oven pre-heating times and operating times for other equipment;
- supporting the introduction of new energy efficiency operating standards as part of the Bakers Delight quality assessment system;
- recording electricity and gas meter readings;
- improving waste management practices by:
 - re-using flour bags as rubbish bin liners and
 - developing regional based strategies for group recycling and organic waste collection.

Improvements to occupational health and safety standards within the bakery have also resulted from improved insulation of the oven sides and doors.

IMPROVEMENTS THROUGH WORKING WITH SUPPLIERS

EEBP helped Bakers Delight work with some of its long-term local suppliers to improve the energy efficiency of equipment and in some cases, replace imported equipment. In total, annual energy savings of over \$3,000 were achieved through improvements to equipment (excluding lighting).

Specialist suppliers of ovens and refrigeration equipment agree that the energy efficiency improvements trialled at the Showcase Bakery will benefit the entire baking industry.

Bettacool Refrigeration

Bettacool's Managing Director, Stuart Macfarlane, believes the development of the Showcase Bakery enabled Bettacool to strengthen its ongoing relationship with Bakers Delight and raise awareness about energy conservation within the company, proving that substantial improvements are well within reach:

"All of the innovations will certainly be available to our other customers and some will be implemented as standard. We feel that, as we go along, there will be a long term benefit for us and for our customers—for example, increased reliability, better control and improved energy efficiency."

Moffat Australia

Moffat Australia used the Showcase Bakery opportunity to trial significant improvements to their oven and oven hood designs.

'We've taken the first steps, but have only scratched the surface in terms of possibilities,' said Ron Treloar, National Sales Manager. 'We know there is scope for even further improvements.'

Ron added that Moffat Australia had always worked closely with their customers but had never been approached about improving energy efficiency until this Bakers Delight project, praising EEBP for getting them started.

'We respond to what the customer or what industry wants, but there has to be influence from somewhere else. The meeting organised by EEBP was fantastic, it had a very big impact on us. They did a great job at breaking the ice and we then started to look at the long term savings that could be achieved in bakeries with more efficient ovens.'



LESSONS LEARNED

The Showcase Bakery has demonstrated that significant energy savings can be achieved. As with all projects, lessons have also been learned. These will be valuable to the baking industry and organisations in the retail and franchise sectors interested in saving energy through innovation.

1. Energy efficiency is about more than technology

For the same production value, energy consumption at Mascot (excluding air-conditioning) was found to vary from 127 to 162 kWh per day, a difference of 35 kWh. Improving how staff use equipment, including ovens, air conditioning systems and lighting, could reduce the average daily consumption by about 10 kWh or seven per cent.

2. Ongoing staff commitment is key to successful implementation

Staff have a significant role to play in implementing, monitoring and evaluating results. Maintaining this commitment requires feedback on energy performance and opportunities for staff to contribute to future improvements.

3. Energy efficiency should become part of normal business

Including energy efficiency in the quality assessment system means that Bakers Delight bakery managers will be able to record and compare their energy use relative to a benchmark set by Mascot.

4. Involving suppliers is imperative

A cooperative relationship with suppliers is critical when planning for improvements through innovation. Even if changes to equipment specifications are not planned, suppliers can provide support with staff training and feedback on maintenance and operational requirements. In the long term, suppliers should also receive feedback and performance data so that further improvements can be implemented.

BEYOND MASCOT

Looking to the future, Bakers Delight is now focussing on continuous improvement—the lessons learned and expertise gained have changed the way that Bakers Delight look at the design and fitout of their bakeries.

While the Showcase Bakery is a highly visible demonstration of Bakers Delight's commitment to improved energy management, the partnership with EEBP has also led to improvements within the entire franchise network. Bakers Delight has introduced a range of good energy practices as part of its standard quality assessment system, based on EEBP's *Good Energy Practice Guide for Shop Bakeries*. For the more than 650 bakeries in the network, energy management is now becoming part of what Bakers Delight bakeries will need to achieve the highest standard of operation.

The Mascot bakery has extended an open invitation for Bakers Delight staff and franchisees to visit the Showcase Bakery and to see the initiatives developed. A staff awareness-raising tour across Australia, hosted by Denis Littleford, Stakeholder Relations Manager at Bakers Delight, is contributing to staff and franchisee education and awareness.

The role of the Showcase Bakery as a test site will also continue into the future.

'The Showcase Bakery has a monitoring system to record and display the energy consumption of its equipment. It operates as a test facility, providing an opportunity to trial changes, benchmark standards and demonstrate efficiency improvements to franchisees and bakery managers', said a Senior Project Manager at Bakers Delight.

BENEFITS FOR THE BAKING INDUSTRY

The Showcase Bakery project demonstrates that major energy efficiency gains are possible through simple steps that improve energy practices. These include monitoring and recording energy use; working with equipment suppliers and improving bakery layout; and reviewing the energy efficiency of equipment in the bakery. Details of all the energy efficiency initiatives included in the bakery are found in the table of improvements.



MORE INFORMATION

The publication of this case study comes at the conclusion of the Energy Efficiency Best Practice program (EEBP). The case study, and other materials produced by the EEBP, are available from the Department of Industry, Tourism and Resources website (www.industry.gov.au/energybestpractice).

An innovation and training resource kit providing detailed guides on running the Big Energy Project (BEP) and Best Practice People and Processes (BPPP) approaches is currently being developed and will be available from the same website in the near future.

For more information on the EEBP, please contact (02) 6213 7878 or visit www.industry.gov.au/energybestpractice

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