

McDonald's Head Office

An ECOsystems Case Study

How even modern commercial office buildings can reduce energy consumption by more than 20%



SAVING ENERGY AND THE ENVIRONMENT

ECOsystems was established in 1995 to save energy and the environment. Since then, we have won five National awards for our energy efficiency projects, including an award for our projects with McDonald's.

Our vision is to enable our business partners to control their energy efficient building services from wherever they choose, to minimise energy use, save the environment and maximise comfort and security.

- Reduce Energy Costs
- Simply control your lighting, heating, cooling, appliances and hot water from a web browser
- Reduce harmful greenhouse gases

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BACKGROUND

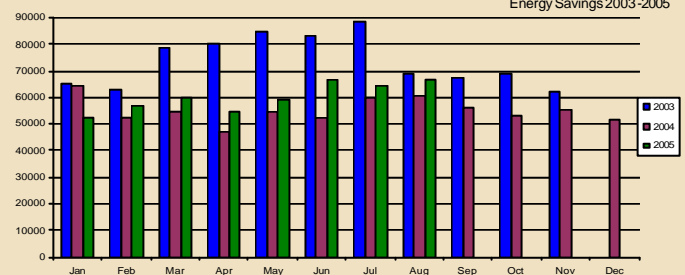
In November 2003, McDonald's Head Office moved from a leased facility into a newly completed purpose-built building in Auckland. After only six months, their entire annual energy budget had been spent.

ECOsystems were employed to carry out an energy audit of the new building to identify potential savings and work out how to reduce energy budget spending.

As a result of the audit, we identified significant potential for savings. It was predicted that the energy upgrade would reduce the energy consumption and demand at the site. The findings were presented to McDonald's, who employed ECOsystems to install the recommended solutions.

The energy efficiency upgrade was completed between January and March 2004.

McDonald's Head Office Energy Savings 2003-2005



ENERGY SAVINGS

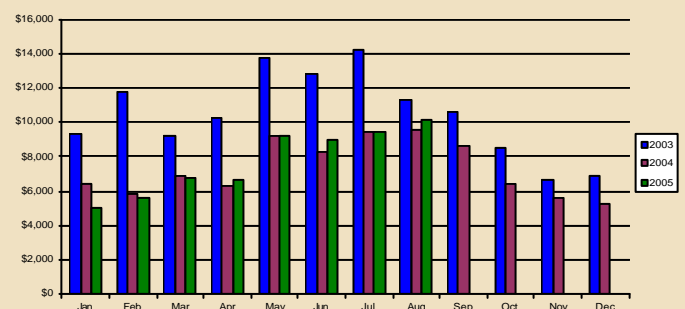
Over the last 20 months since the upgrade, energy savings of 349,204 kWh (see graph above) and \$68,255 (see graph below) have been achieved.

This equates to a 23.4% reduction in kWh which surpasses the national energy efficiency strategy target of 20%.

Demand savings of 1,052 kVa have also been achieved.

Large maintenance savings resulted in total savings of nearly \$40,000 per annum for our business partner.

McDonald's Head Office Cost Savings 2003-2005



Read on to discover how ECOsystems were able to create these significant savings ...

EAS benefits include -

- Simple Control
- Reduced CO₂ emissions
- Lower Maintenance costs
- Free cooling
- Reduced energy costs
- Reduced line charges
- Maximum comfort and security

EAS

ECOsystems replaced the existing BMS with an Energy Automation System (EAS) which controls the Air Handling Units and Fan Coil Units in the building.

The EAS looks at what electricity is being consumed and the heating and cooling demand requirements on each floor.

The system monitors the air temperature recorded by the temperature sensors.

The EAS then chooses the most energy efficient way to satisfy the air-conditioning demand requirement without adversely affecting the internal environment—while saving energy and high demand costs.

The EAS uses free fresh air to cool areas before requiring operation of the chiller.



LIGHTING

The EAS controls the light fittings and the lighting levels via C -Bus.

The integration of the EAS with the CBus lighting control system is achieved through innovative interfaces designed by ECOsystems.

The light fittings are controlled via a time schedule and through occupancy sensors.

Lighting levels are measured through light level sensors mounted on the ceilings.

The system takes into account the natural daylight and adjusts the output of corresponding fittings in order to maintain a constant light level at each desk.

The existing light fittings were replaced with energy efficient ones, saving 45% of lighting energy.

By using the natural resources like sunlight and fresh air, energy costs are reduced significantly.

BUSINESS PARTNERS

ECOsystems works hard to develop long term relationships.

In this example, we partnered with:

- McDonald's
- Climatech—who worked with us to maximise the air conditioning savings
- Newpower Electrical—for the installation

CONTROLS

A web browser front end controls all plant and equipment.

ECOsystems' aim is to make controlling energy use in the building as simple as browsing the internet.



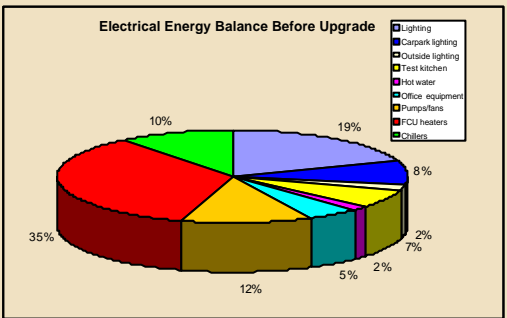
INSTALLATION

The change-over of all lighting and the BMS, needed to occur whilst the building was fully occupied and running as usual.

90% of the installation was completed during normal business hours.

This always provides a challenge, but working closely with the contractor and client makes the process much smoother and enabled the project to be installed on time and within budget.

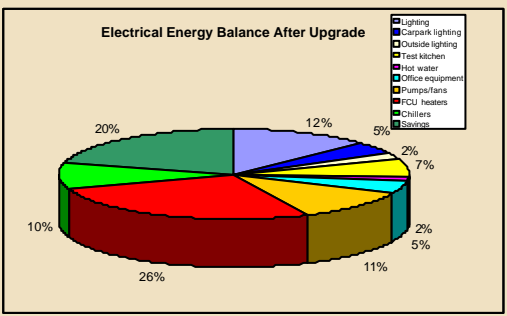
We monitor and graph results for our clients to prove that the results we predicted actually occur



ENERGY USAGE

The chart above shows the energy balance for the Head Office building before the upgrade, showing a typical breakdown of energy usage areas.

The chart below shows the energy breakdown after the upgrade (note that savings of 20% have reduced a considerable portion from the energy usage, particularly from the costs of heating and lighting).



McDONALD'S TRAINING CENTRE

ECOsystem's aim is to become a full business partner with our clients.

Our focus is on the practical installation of energy efficient measures and we would be happy to discuss individual requirements with you.

Add on the maintenance savings and you can see why our client is pretty happy with the result of this project and recently asked us to complete a second project at their Training Centre.



The installation at the Training Centre was completed in June 2005.

In the last five months, energy savings of 16,414 kWh and \$2,075.17 have been achieved.

This equates to a 52.9% reduction of kWh!

These energy efficiency upgrades support the national energy efficiency and conservation strategy target of 20%.
 This is a realistic objective in the office building sector.
 It proves energy savings potential even in new office buildings.
 Older buildings are likely to achieve even greater savings.

If you would like further information on how ECOsystems can improve the energy efficiency of your building please contact us on +64 4 566 3666 or view our website www.eco.co.nz

