

Innovative lighting cuts energy use, CO₂ emissions and brings bottom line rewards

State-of-the-art lighting controls are helping Progressive Enterprises meet tough sustainability targets, while delivering huge benefits to the bottom line. The home-grown technology is a New Zealand first, and is now being trialled in Australia.

Lighting automation via wireless

In two of Progressive Enterprises' Auckland and Christchurch distribution centres, forklifts are fitted with wireless devices that activate LED lights, illuminating work areas as they move around the site. The high-tech project has eliminated over-lighting and improved safety, while also cutting annual energy costs to the tune of \$494,000. It's put Progressive in a great position to not just meet, but exceed its corporate CO₂ targets – despite increasing store numbers and the size of its distribution centres.

Corporate drive to cut energy use

Progressive Enterprises owns and operates 166 Countdown supermarkets throughout New Zealand. Owned by Australian parent company Woolworths, it's tasked with meeting corporate sustainability targets to reduce its carbon footprint by 40% by 2015.

However, growth meant that in 2011 the company had to open a fourth distribution centre in Wiri, Auckland, adding 30,000sqm to its logistics network. It also expanded its Christchurch distribution centre, which was badly damaged in the earthquakes. With growing energy demand, meeting the ambitious CO₂ target needed creative solutions.

Innovative technology to cut over-lighting

In 2011, Progressive decided to close the smaller of its two Christchurch distribution centres and expand the larger Hornby centre by 10,000m². This was a perfect opportunity to improve lighting efficiency in the expanded site.

Digital Light Solutions, working with Auckland-based LED manufacturer Compuspec, proposed a solution using cutting-edge technology:

- highly efficient 120-watt LED lights in high-bay fittings
- daylight sensors to make the most of available natural light
- motion detectors on lights - switched on via wireless emitters on forklifts.

The innovative design effectively has lights and forklifts 'talking' to each other – when a forklift approaches, the area lights up – and when it moves away, lights switch off again.



Progressive cut their annual energy costs by \$494,000 through state-of-the-art lighting controls

✓ Key features

- 120-watt LED lights installed in Auckland and Christchurch distribution centres
- Daylight sensors measure natural light, dim lights accordingly
- Motion detectors turn lights on in 40m radius of forklift zone
- 2.5 month payback on LEDs in Christchurch extension
- Electricity saved more than entire annual consumption of new 30,000 m² Wiri distribution centre
- Safety controls added to forklifts

✓ Key benefits

- 2,906 MWh electricity saving per year
- CO₂ emissions reduced by 375 tonnes/year
- Total cost saving \$494,000 a year
- On target to reduce CO₂ emissions to 2006 levels by 2015
- Improved site safety

✓ Sector applicability

- Commercial Lighting
- Most office environments

Three-month trial enabled fine-tuning

Before committing to the project, Progressive ran a three-month trial at the Hornby centre. In particular, they were keen to see whether the technology interfered with the existing wireless network used for orders. Technically the controls worked well, and the trial helped set the optimum lighting area. Initially set to illuminate a 25m area in front and behind the forklifts, this lit area proved uncomfortably tight for operators; the distance was widened to 40m and staff were happy.

Less than three-month payback in extension

Following the trial's success, the Hornby fit-out got the green light, and was complete by May 2012. Although LEDs have a higher upfront capital cost than other types of lighting, installing them in the new extension from the outset proved surprisingly economic.

The cost for LEDs was around \$110,000 more than using T5 fluorescents. But the revised design meant many building costs could be removed, and there was no need for a C-Bus system to run the lights. This eliminated the need for around \$100,000 worth of kit – meaning the LEDs effectively paid for themselves in less than three months.

Auckland gained further savings

The Mangere distribution centre in South Auckland was next to be retrofitted, with the project completed in February 2013. Nearly twice the size of Christchurch, Mangere has achieved 41% electricity savings - 1,770MWh per year.

These energy savings have more than off-set the extra energy use of the new 30,000sqm distribution centre in Wiri, Auckland – putting Progressive on track to comfortably reach its CO₂ emissions target.

	Hornby, Christchurch	Mangere, Auckland
Site size	30,000m ²	56,000m ²
No. of LEDs installed	595	1,041
Electricity reduction / yr	1,136 MWh	1,770 MWh
Energy cost reduction	51%	41%
Energy cost savings / yr	\$159,000	\$230,000
Maintenance savings / yr	\$30,000	\$75,000

Safety and maintenance benefits

As well as improved efficiency, the new LED lights are longer-lasting, saving on maintenance costs. According to National Facilities Manager Jared Day, the LEDs have an expected life of 100,000 hours – but they're not running at 100%, so they won't need maintaining for a staggering 14 years. This compares to an average two-year life for the fluorescent tubes and metal halide bulbs they replaced to maintain operational lighting levels. The project also enabled a side safety initiative: safety vests issued to site visitors are fitted with wireless emitters. These work in conjunction with forklift hoists, making a distinctive beep when someone approaches – minimising the chance of accidents.

Key personnel

Dave Reid, Director - Digital Light Solutions dave@digitallightsolutions.co.nz

Jared Day, National Facilities Manager - Progressive Enterprises www.progressive.co.nz



Innovative lighting

Dave Chambers, Countdown Managing Director

“Progressive has a very strong commitment to improving our environmental performance, so trialling and installing new lighting technology when we had the chance, was a good fit with our vision. We're delighted with the result - this project alone has cut our annual CO₂ emissions by around 375 tonnes, not to mention strong financial savings and safety benefits. We're better equipped to service the needs of our suppliers and customers and we're well positioned for growth.

“The lighting technology in our distribution centres is a first in New Zealand – making them the most energy efficient facilities of this type in the country. This Kiwi-designed and manufactured product is now being trialled by other Woolworths businesses in Australia. It's market-leading technology.”

JULY 2013/EEC2890

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