

Electronics whiz invests in energy efficiency



Energy Efficiency and Conservation Authority
Te Tari Tiaki Pūngao



Tait Electronics finds energy efficiency worthwhile because every dollar saved goes straight to profits.

An upgrade of 2600 light fittings paid for itself in 15 months, while improving the output of light.

ALTHOUGH **ELECTRICITY** COSTS MOBILE RADIO EXPORTER **TAIT ELECTRONICS** MUCH LESS THAN **RAW MATERIALS** AND **LABOUR**, THE COMPANY RATES **ENERGY EFFICIENCY** AS AN **ESSENTIAL ASPECT** OF ITS ATTENTION TO **QUALITY**. ▶

Emprove is a service provided by the Energy Efficiency and Conservation Authority (EECA).

To find out how your business can save energy, visit www.emprove.org.nz or ph 0800 358 676.



About Tait

Tait Electronics is New Zealand's largest electronics company. It is a major international supplier of mobile radio equipment.

Its products are used in around 160 countries.

They include portable and mobile radios, and voice and data communications systems, ranging from local area coverage for organisations such as airports, factories and universities, to vast national networks.

Tait has around 800 staff in 10 countries.



Tait Electronics in Christchurch is a paradox – a company that has achieved a long life and stability in an internationally competitive industry that demands innovation and flexibility.

Founded by Sir Angus Tait, who in his 80s is still active in the company, it is New Zealand's largest electronics company, exporting 95% of its products and importing 60% of its raw materials. It has an annual turnover of \$150 million and is owned by the Tait Foundation.

The brainpower emanating from its multi-building campus near Christchurch International Airport could fuel any number of university engineering schools, but the development labs and manufacturing areas have an air of South Island serenity.



Keeping the company's energy management on an even keel is Kevin Murphy, a protegee of previous energy manager Mike Khan, who is stepping down his hours. Murphy spends around 15% of his time on energy management. He supplies the financial director with weekly written reports.

The plant operates 24 hours a day, five days a week, and sometimes on Saturdays for special orders.

Although energy is not a major cost, at \$340,000 a year coming well down the list after raw materials and labour, it's important for Tait to keep costs down.

The company is aware that a dollar saved on overheads is a dollar on the profit line – and when orders are thin, energy savings are very welcome.

Lighting upgrade

When Tait took over its unusual circular building in 1982, the lighting levels at workbench height were inadequate for the fine work of electronics manufacturing.

Khan's and Murphy's lighting upgrade made work surfaces brighter while reducing energy consumption.

For around \$100,000 they installed shiny mirror surfaces to replace the white coated reflectors on the fluorescent light fittings. This raised benchtop lighting levels from 400-500 lux to 800-900 lux.

Later, they trialled Light Manager, a device that reduced the lighting's power consumption by slightly lowering the voltage. For a barely perceptible drop of 10% in lighting levels, they saved 25% of power consumption.

The power company and its network successor, Orion, were keen to reduce the load on the tightly constrained electricity network, particularly at times of peak demand. Light Manager was one way they could do it.

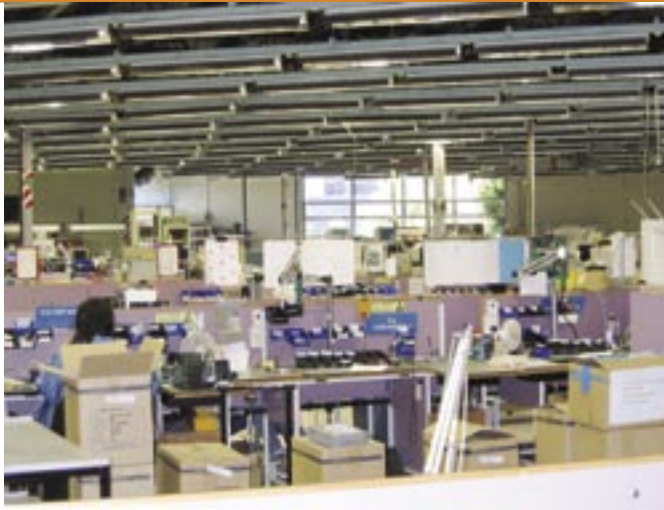
Tait later installed Light Manager throughout the plant. It works well with the electronic ballasts that are being progressively installed to replace the old magnetic ballasts.

TAIT ELECTRONICS CENTRAL SERVICES MANAGER **KEVIN MURPHY** (LEFT) AND HIS PREDECESSOR **MIKE KHAN**.

Better light, using less energy

Installing the Light Manager voltage controller for the ceiling fluorescent lamps paid for itself in 15 months.

This added to the savings achieved by upgrading the tubes and their ballasts.



FAR LEFT: A LUMINAIRE IN THE PROCESS OF BEING UPGRADED WITH AN **ELECTRONIC BALLAST**. **LEFT:** IN THE MAIN MANUFACTURING BUILDING, THE **LIGHT LEVELS HAVE BEEN INCREASED** BUT THE LIGHTING **CONSUMES LESS ENERGY** THAN BEFORE.

Results of the luminaire upgrade project

Area	Number of luminaires	Annual power reduction (kWh)	Total project cost (\$)	Return on investment	Amortisation (months)
Manufacturing	1886	126,900	\$24,900	\$20,000	15
Store and technical	274	25,600	\$4,400	\$3,800	14
Office areas	440	92,400	\$16,900	\$15,600	13
Total	2600	244,900	\$46,200	\$39,576.68	

The combination of electronic ballasts and Light Manager with slim 26W new generation triphosphor fluorescent lamps saved 50% of the power per luminaire.

The Light Manager project paid for itself in 15 months. The lighting upgrade reduced campus power consumption by 6.5%.

Other lighting projects

In the main building, Khan and Murphy designed zones for light switching. A layout diagram on the wall next to a bank of labelled wall switches encourages people to light only the zones they need.

Because the production benches and lines are frequently rearranged to accommodate changes to the manufacturing processes, it's important for the lighting zones to be flexible.

TAIT OCCUPIES A LARGE CIRCULAR 1960S BUILDING WITH A SAW-TOOTHED PERIMETER.

THE UNUSUAL DESIGN IS BY ARCHITECT **C B WELLS**.



Tait Electronics campus



1 558 Wairakei Rd
Reception, manufacturing, inward and finished goods, strategic sales.

2 540 Wairakei Rd – Christchurch sales office, NZ head office, global technical support.

3 535 Wairakei Rd – Global sales and marketing, technical training and development.

4 175 Roydvale Ave – International headquarters, finance, HR, quality, development.



SECURE STORAGE

ENCOURAGES STAFF TO **BIKE TO WORK** INSTEAD OF DRIVING.

TAIT ALSO ASKED THE COUNCIL TO LOCATE A **BUS STOP** OUTSIDE ITS PREMISES TO MAKE IT EASIER FOR STAFF TO CATCH THE BUS.



LEFT: A MAP SHOWING THE VARIOUS LIGHT SWITCHING ZONES MAKES IT EASY FOR **STAFF** TO FIND THE RIGHT SWITCH FOR THEIR OWN ZONE.

THIS IS AN **IMPROVEMENT** ON GENERAL SWITCHING THAT WASTED LIGHT BY ILLUMINATING UNOCCUPIED ZONES.

The claimed power savings are 70%, which would save 16,000 kWh a year.

Also being investigated is a variable speed drive rotary screw air compressor for the manufacturing site.

The technology is claimed to have a saving of nearly 40% over the current rotary screw air compressor, with potential annual savings of around 106,000 kWh.

Measuring

Tait does on-line electricity meter reading through NGC, which in 2005 introduced its new product, Interactive Energy Manager (iEM).

IEM takes time interval metering data from the site and sends it electronically to NGC, which makes it available for review and analysis. It allows the creation of reports and graphs, making it easy to see where anomalies are occurring and to compare month by month or other frequencies.

The data can be exported to spreadsheets.

Tait's daily energy consumption figures are displayed on a staff intranet so people can track energy consumption against the previous year's.

Power factor

The power quality is high, with a power factor of 0.95 to 0.99. This is a necessity for an electronics manufacturer.

Transport

The site is on a good bus route to the city. The company offers free car parking but only the salespeople get company cars.

Secure bike storage is provided.

Managing director Michael Chick says they have looked at various means of reducing the energy and money spent on international travel, but with such a large export focus in so many markets, particularly in Asia, face-to-face contact is still important.

Tait uses video-conferencing for some meetings in New Zealand.

Environmental management

Tait embarked on an environmental management programme and has achieved ISO 14001 in energy management projects.

Competition and the international market put pressure on Tait to make its products more energy efficient.

Equipment such as telecommunications base station gear that relies on solar energy needs to be particularly energy-efficient.

► The other three buildings have a more typical layout of offices and cubicles.

Tait is also using 20W compact fluorescent lamps as night lights.

It has 15W compact fluorescents with in-built motion-dector sensors in areas that are not continuously occupied, such as cafeterias.

To stop staff bringing in their own 2400 watt fan heaters, 21 Thermowarm underdesk heaters have been provided. The 190 W heaters heat objects rather than air.

Murphy is investigating power inverter air conditioning systems for two meeting rooms.

CREDITS

Tait Electronics Ltd energy manager
Kevin Murphy

EECA advisor Graeme Kerr

Case study author Cathy Sheehan

See more about NGC's energy monitoring software at www.ngc.co.nz/iem