

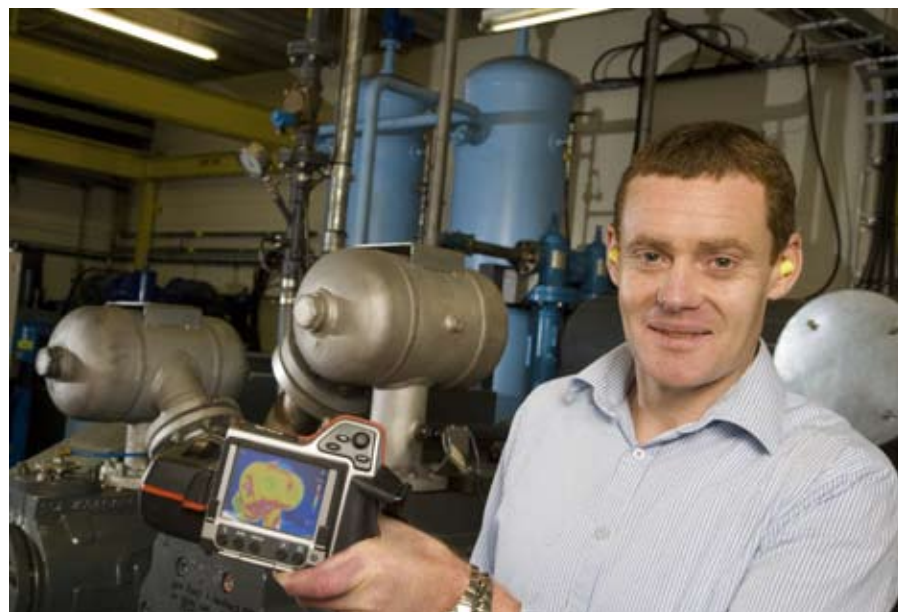
# Compressed air auditing shows huge savings potential

A compressed air auditing program developed by the Electricity Commission is set to play a significant part in achieving targeted energy savings of \$2 billion a year for the New Zealand manufacturing sector within five to 10 years.

Research by the New Zealand Electricity Commission showed electricity savings of 230 GWh a year could be achieved through improvements in compressed air systems - enough to keep a city the size of New Plymouth in electricity for a year, or more than the Cobb power station generates annually. Not having to generate that amount of electricity would also mean reducing carbon emissions by 46,000 tonnes per year.

The Commission has been the catalyst in bringing together industry interests, including the Energy Management Association of NZ, University of Waikato and members of the Compressed Air Association of Australasia, to work on ways to capitalise on the savings opportunities.

This has resulted in a framework for certifying compressed air systems auditors and complementing their existing business activities. New Zealand's first two compressed air systems auditors have been accredited, and 13 more have completed training at the University of Waikato and are on the path to accreditation.



Andy Logue uses a thermal imaging camera to monitor the temperature on a multi-stage, high-pressure air compressor at a large plastics blow-moulding bottle manufacturer.



The Energy Management Association assesses whether the auditors meet the requirements for accreditation.

So far, 115 'walk-through assessments' of compressed air systems have been completed through a program supported by the Commission. Typically, the assessments have identified electricity savings from the air systems of around 30%. The compressed air audits also calculate payback time for implementing changes and in many cases this was less than two years.

Compressed air is an expensive form of stored energy - even when a compressed air system is operated perfectly. More commonly there are many inefficiencies, resulting in less than 10% of the energy input into a compressed air system being used productively.

Air leakages, inappropriate use of compressed air, or the way the compressors are controlled to maintain the supply of air can substantially increase the amount of electricity consumed. Inflating a car tyre uses about \$1.50 worth of electricity, but as stored energy the compressed air is worth only 15 cents. The difference is in the amount of energy given off as heat during the compression process, which makes compressed air one of the most expensive forms of energy.

The Executive Officer of the Energy Management Association, Ewan Gebbie, said there was a huge information gap and quantifying an individual manufacturing plant's losses was an obvious answer.

"It builds awareness with management that the hissing noise they hear down

the back of the factory is actually costing them 50 cents a minute, so they'll fix it straight away," he said.

Several major South Island manufacturing companies have slashed their electricity costs and made a climate change statement by adopting improvements to their compressed air systems.

Robert Norriss from Christchurch is one of the country's first two Accredited Compressed Air System auditors, and is part of the initiative to cut electricity demand among larger compressed air users in the manufacturing, food and light engineering industries.

Compressors generate a lot of heat that in many cases cannot be easily harnessed. But CWF Hamilton, which makes the Hamilton jet boats in Christchurch, channels the heat into its paint spray booth to snatch back some of the costs of making the compressed air.

In the food processing industry, Silver Fern Farms' Belfast plant in Christchurch was one of the first to have its compressed air system audited by Norriss. Already four times more efficient than European meatworks, the plant reduced its annual electricity costs by about \$25,000 with improvements to its compressed air systems servicing the stock processing areas and the effluent plant.

Norriss said that in addition to their positive contribution to the bottom line, the improvements provided Silver Fern Farms with another green angle when questioned in international markets on the energy costs of its products or food miles.

Gebbie agreed that New Zealand trade negotiators would now have another card to play, if their international counterparts accused our food giants of dragging the chain on climate change.

Export markets would slap on trade sanctions at the bat of an eye, if they thought New Zealand was not paying enough attention to climate change. Once in place, sanctions would take years to remove, he said.

"They dropped the food miles debate in Britain when MAF proved that the average shopper spent more energy getting to the supermarket than we spent getting the product onto the shelves."

Other major players in the food industry, such as AFFCO, Alliance Group, Fonterra, NZ Sugar and Westland Dairy, have also

been involved with the Commission in the program, which targets the top 500 industrial users of compressed air.

Norriss has had similar success in the timber industry. The audit of Nelson Pine Products showed \$280,000 a year was being spent on electricity to generate compressed air and identified potential to save \$90,000 annually, for an estimated one-off cost of \$150,000.

"It's a no-brainer for the client companies," he said. "The Electricity Commission pays for an initial walk-through assessment of a company's compressed air system. Many of the improvements are obvious from the walk-through assessment. If a follow-up, in-depth audit is undertaken (to more accurately quantify the savings and the payback on doing corrective work), the client companies make a commitment to actioning recommendations that fit within an agreed payback period."

Andy Logue is the North Island's first accredited compressed air systems auditor, and his new energy-auditing business is booming.

Three years ago he operated out of his bedroom. Now his company, Energy NZ, is based in smart premises on Auckland's North Shore. He employs 10 staff and he's just picked up his first contract in Australia for a major food manufacturing business.

Logue has high praise for the Electricity Commission and sees a long-term future for his young company. He's bought \$250,000 of equipment, including a thermal imaging camera that gave him change of \$100 out of \$50,000.

"We've had a huge response to the range of services we offer and have completed projects for many of New Zealand's big manufacturers and high energy users," he said. "That's not bad for a boy who served his apprenticeship in Taumarunui in the early '90s."

Logue said that until Waikato University started training staff there were no formal qualifications for developing and assessing compressed air systems, and that could be used widely across a range of trades.

"You trained as an electrician or plumber, but now you can get compressed air training from the university and the qualifica-



*Compressed Air Association of Australasia's project director, Julia Beck.*

**"The audit of Nelson Pine Products showed \$280,000 a year was being spent on electricity to generate compressed air and identified potential to save \$90,000 annually, for an estimated one-off cost of \$150,000."**



*Dean Lewis spray-paints a Hamilton jet boat unit where heat from making compressed air is recaptured to help dry the paint.*

tion is transferable to Australia," he said.

"EMANZ administers the auditor accreditation scheme, with responsibility for assessing applications against specific performance standards. The CAAA has bought into the scheme as a world-leading solution to the recognised shortage of compressed air systems expertise."

Collectively, that support locked in the end-to-end industry backing the scheme needed to be sustainable in the long term, Logue said.

Compressed Air Association of Australasia's Project Director, Julia Beck, says New Zealand is onto a worldwide climate change winner with its compressed air programs.

"In Australia, there is potential for billions of dollars in savings from reduced electricity consumption," Beck said. "Our problem in Australia is that state governments are responsible for energy efficiency programs and they are notorious for disagreeing, making it difficult to introduce nationwide energy-efficiency initiatives."

"But the New Zealand model is providing proof that the Electricity Commission's program is working and we will use this in Australia to convince the authorities that this is a winner for climate change," she said.

"Nowhere else in the world has advanced to the stage that New Zealand has achieved and there is every reason for the New Zealand model to be picked up worldwide. We are also engaging in the development of an ISO standard for the auditing, which will improve the program's international appeal," Beck said.