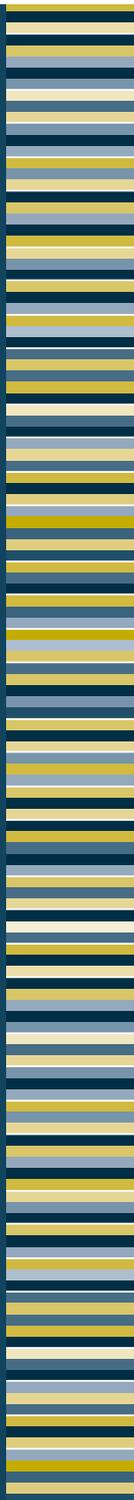


Sustainable Management Fund Project 4114

This publication is also available at:

<http://www.arc.govt.nz/cp>



# You too can profit from cleaner production and waste minimisation





# now is the time for cleaner production

Cleaner production is the way ahead for business. It is the way of the future, and it can make your company major financial gains. Ignoring it simply does not make good business sense.

Cleaner production is all about increasing efficiency, reducing waste and preventing pollution.

It encompasses everything from the supply and use of raw materials and resources, product design, management techniques, through to waste management.

Across all these areas, the focus is on prevention - looking 'up the pipe' to the source of waste and inefficiencies, not simply at disposal.

The rewards of taking steps to cleaner production can be immense: for your workplace productivity and bottom-line profit - as well as for the environment.

## The Rewards

### Increased profits:

lower expenditure on raw materials, water and energy; on production costs; and on waste treatment and disposal.

### Environmental compliance:

compliance with RMA resource consents and local body regulations.

### Reduced risks:

minimise the risk of fines and bad publicity through environmental and health problems - and boost investor confidence.

### Better public image:

gain a powerful competitive edge, and help the 'clean, green' international image of New Zealand as a whole.

### Higher morale:

staff and the wider community appreciate, and respond to, high environmental and workplace health standards.

On the following pages, you'll read about recent cleaner production projects, implemented by several New Zealand companies. The results are impressive. In many cases the companies made financial gains totalling tens of thousands of dollars - almost immediately and with minimal capital outlay.

Read on and find out how your company, too, can profit from cleaner production.

# Target Zero

The power of cleaner production was recently demonstrated by Target Zero.

Target Zero was a programme which ran from 1997-9, with the support of the Ministry for the Environment's sustainable management fund. It was managed nationally by Meridian Energy Ltd (formerly ECNZ), and supported by local power companies. Christchurch City Council and Hastings District Council were the key local stakeholders in Target Zero.

Twenty two businesses were involved, encompassing manufacturing, primary processing, and service sectors. The goal was for all companies to improve environmental performance - and enhance business performance.

The 'vision' of Target Zero was to kick-off 'networks' of companies in each region, so they could learn from one another's experiences, share ideas, and give mutual support. The companies established lines of communication, through meetings, newsletters, email and phone.



Howard Le Couteur,  
Accountant, Alliance Group Ltd  
(Sockburn)

We could see there would be financial benefits to cleaner production - and our expectations were confirmed. I would recommend anyone consider introducing the processes of cleaner production. You're bound to identify benefits, as far as improving cost performance. It's a very worthwhile exercise.



Roger Seach,  
Managing Director,  
Leiner Davis Gelatin  
NZ Ltd

Going into the programme I was skeptical that it would be self-funding, but I now believe that when approached in the correct way - cleaner production can in fact much more than pay for itself. Also, as a result of our involvement in the Target Zero network we are much more aware and proactive in dealing with environmental effects. The programme has added considerably to the value of our environmental management system.



Clive Bleaken,  
Technical Development Manager,  
Mainland Products Ltd

We were doing pretty well as a company - we considered ourselves to be leading the field. But the Target Zero cleaner production process allowed us to find even more gains. The key was the systematic approach - none of it was rocket science! Our investments were minor, and the savings are large and ongoing. It's like money for jam! I certainly recommend it. In any good company, there's scope for improvement.



## STRONGER together

This model of interaction proved very rewarding. The levels of enthusiasm and ideas generated were far greater than if the companies had been developing their cleaner production programmes in isolation. Improvements were made systematically and more comprehensively, and the network helped encourage a longer-term commitment from the staff and management of the participating companies.

The conclusion is clear: by building a 'critical mass' of companies committed to cleaner production, every one of those companies is in a far better position to sustain cleaner production initiatives.

Interaction increases the potential environmental and financial rewards for everyone involved. There can be no argument with this: just look over the page.

Some sample case studies are featured in this brochure and can be accessed in full at:  
<http://www.arc.govt.nz/cp>



# The total value of the identified savings to the 22 Target Zero participants was \$3.95 million per annum

## The Results of Target Zero.

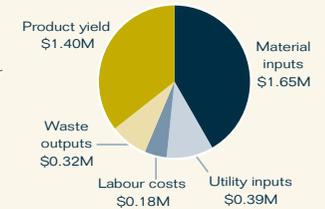
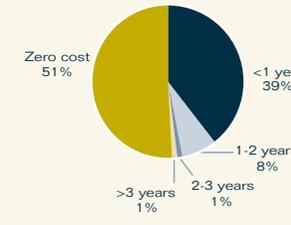
The significance of the savings to the participating businesses can be expressed as a proportion of their annual turnover.

For the Target Zero companies, the savings ranged from 0.02% to 4.7% of turnover.

These savings represent an improvement in business efficiency and are added directly to the bottom-line profit, which of course is in most cases significantly smaller than the turnover.



Approximately 80% of the identified options had been implemented, or were in the process of being implemented, at the conclusion of the formal programme.



When evaluating options to improve business performance, the cost benefit is a key criteria. 41% of the identified options required no capital investment to make savings, and a further 45% had a payback of less than a year.

On a savings basis, the story gets better! 51% of the \$3.95 million savings identified was realised by implementing projects with no capital cost. An additional 39% of the total savings were achieved with a pay-back under one year. In other words, 90%, or \$3.55 million of savings had a payback of a year or less!!

The bulk of the savings identified by the companies was in reductions of the material inputs to their processes and in improved yield of the products produced.

The savings that were made had an obvious environmental as well as financial benefit. For example, energy savings resulted in a reduction in CO<sub>2</sub> emissions; savings in material use and improved production yields reduced the use of material resources; savings in water consumption reduced the demand on the aquifer supply.

Table 2: Summary of savings by category

Category of saving	Hawkes Bay	Christchurch	Total
<b>Inputs</b>			
Water, m <sup>3</sup>	364,200	94,200	\$62,190
Fossil fuels, GJ	26,430	17,740	\$265,300
Electricity, MWh	430	535	\$63,550
Material	\$1,155,970	\$489,440	\$1,645,410
<b>Outputs</b>			
Trade waste, m <sup>3</sup>	387,280	123,990	\$116,210
Solid waste, tonnes	1,680	890	\$239,300
Product	\$710,890	\$684,160	\$1,395,050
CO <sub>2</sub> emissions, tonnes	2,590	1,850	4,440 tonnes

## SYNERGIES WITH MANAGEMENT SYSTEMS

Leiner Davis Gelatin N.Z. Ltd,  
Christchurch

Part of the Goodman Fielder Group, the company manufactures gelatin and speciality gelatin products.

Their cleaner production programme complemented Leiner Davis's commitment to continuous quality improvement and was a key to them achieving accreditation to the ISO 14001 environmental management system. In 1999 ISO 14001 was integrated into their existing ISO 9001 quality standard.

In addition, two cleaner production options were identified that reduced rework and improved product yield.

**Capital outlay:** None  
**Annual savings:** \$28,000  
**Payback:** Immediate

## IMPROVING PRODUCTION YIELD

Skellerup Industries Ltd,  
Christchurch

Skellerup Industries is a rubber manufacturing company that was started in 1910 with the establishment of several Para Rubber shops. A manufacturing plant was established at the current Woolston site in Christchurch in 1935.

One of their processing machines historically had an unacceptable product yield on certain products. By fitting a special attachment to the machine the requirement for manual handling and edging misalignment has been reduced. Waste reductions have been achieved by reducing the amount of off-cuts, and rejects have been reduced.

In other words, product yield has been increased.

**Capital cost:** \$20,000  
**Annual savings:** \$269,480  
**Payback:** < 1 month

## IMPROVING PRODUCTION YIELD

ENZAFOODS Ltd, Hastings

ENZAFOODS is a major manufacturer of fruit and vegetable juice concentrates and other processed apple and vegetable products.

Approximately 150,000 litres of concentrated juice was being lost per annum. A new process was developed to ensure that all of this lost product was captured, therefore maximising the sugar recovery. Although the new process has meant an increase in maintenance and operating expenses, there has been a large gain in the overall product yield and a reduction in the wastewater pollutant load.

**Capital cost:** \$400,000  
**Savings:** \$222,500/annum  
**Payback:** 22 months

## MANAGEMENT COMMITMENT

Richmond Ltd, Leathers, Napier

The Richmond Leathers Tannery is in Napier and processes beef hides and lamb pelts, producing salted, lime split and wet blue hides and finished leather product.

A key success factor for Richmond Leathers was the commitment by management of a staff member's time and the identification of responsibility for their cleaner production programme in the staff member's job description.

Savings were made in a number of areas including water and gas consumption and through reduced disposal costs and improved product yield.

**Capital cost:** \$21,200  
**Savings:** \$312,000/annum  
**Payback:** < 7 months

## THINKING OUTSIDE THE SQUARE

Napier Leathers

Napier Leathers processes sheep pelts and deerskins into a wide variety of finished leathers, marketed worldwide.

Cleaner production saw the company think 'outside the square' in minimising resource use and wastes.

After metering water use around the plant, they focused on retanning and dyeing. They completely reviewed the process, and developed a new 'compact' process which reduced the number of washes used. The result was a 47% reduction in the use of water, 45% reduction in electricity, a significant reduction in chemical use - and no loss of quality.

**Capital outlay:** Staff development time only.  
**Annual savings:** \$470,000  
**Payback:** Immediate

## A FOCUSED APPROACH

Alliance Group Ltd, Sockburn

The Alliance Group is the second largest meat exporter in New Zealand with 7 South Island works and a corporate head office in Invercargill.

Alliance identified water consumption as a key issue on which to focus their time and resources, as reducing hot water consumption meant savings in energy, water and trade waste costs. A triple whammy!

Hot water sterilising sprays on the viscera table accounted for 13% of plant hot water use. By replacing two hot water viscera table washers with warm water washes, the total plant hot water usage and associated energy was reduced and the cold water required for cooling the trays was eliminated.

**Capital cost:** None (maintenance)  
**Savings:** \$25,670/annum  
**Payback:** Immediate

## MANAGEMENT SUPPORT, TEAMWORK AND FOCUS

Mainland Products Ltd, Christchurch

Mainland Products (formerly Huttons Kiwi) operated a meat small-goods manufacturing plant at Bromley in Christchurch.

A motivated and enthusiastic team with good staff representation and management support identified a number of projects generating significant savings.

Their team approach was inspirational for another Target Zero company that also began including a wider cross-representation of staff – not just managers.

One project identified that a proportion of processed sausages was disposed to the landfill because of the skins unravelling as a result of the end of the skin not being adequately secured.

A simple procedural change ensuring an additional twist to the skin prevented the unravelling and consequent product loss that had been occurring.

**Capital cost:** None  
**Savings:** \$71,100/annum  
**Payback:** Immediate

## BENEFITS FROM TAKING A CLOSER LOOK

Christchurch Polytechnic

The polytechnic offers a diverse place of learning for over 18,000 students. As the first step to 'greening the curriculum' they surveyed the efficiency of rubbish collection around the campus, then renegotiated their waste disposal contract to achieve greater efficiency and recycling of paper.

**Capital outlay:** None  
**Annual savings:** \$20,000  
**Payback:** Immediate

## FOCUS ON THE SUPPLY CHAIN

Ancor Ltd, Hastings

The plant manufactures food cans. Their cleaner production aim was to optimise use of staff and resources by focusing on major waste areas - especially regarding the quality of raw materials supplied to them. For example, analysis showed 12% of tinplate supplied was damaged in some way, resulting in 3% lost production costs. Resulting material, labour and lost-production costs for this alone were hundreds of thousands of dollars a year.

By initiating a quality control programme for suppliers, the costs will be progressively reduced.

**Capital outlay:** Liaison time only  
**Annual savings:** \$260,000 (projected)  
**Payback:** Immediate (once implemented)

## SURPRISE BENEFITS

Tait Electronics Ltd, Christchurch

The company is New Zealand's largest electronics manufacturer, selling to over 80 countries, and with turnover over \$100 million.

Their cleaner production programme focused on circuit board Surface Mount Technology (SMT) because the lead-based paste is very expensive, and as a hazardous material there are staff and disposal issues. A study showed significant wastage, so changes were made to handling and process and air conditioning was found to reduce paste drying.

Paste monitoring analysis were clearly displayed for all staff to see.

The result was dramatically reduced material and disposal costs - and an unexpected benefit due to a reduction in rework from 5,000 down to 100 units per month.

**Capital outlay:** None  
**Annual savings:** \$56,000  
**Payback:** Immediate

# Making cleaner production work for you

## Advice and recommendations based on the experiences of Target Zero...

### Commitment is vital:

- management commitment must be clear
- develop an environmental policy statement
- define clear targets for waste minimisation, with key performance indicators so progress can be measured
- communicate the new policy to staff
- support the policy with a strategy to meet objectives and targets.

### Make accountability clear:

- make cleaner production a board agenda item, with regular reporting of key performance indicators
- include key performance indicators and responsibilities in job descriptions for all management and staff
- set up regular reporting from staff to management
- set up regular external reporting, with at least an annual environmental report.

### Set up cleaner production team(s):

- include a cross section of skills and responsibilities (eg managerial, technical, production, marketing)
- the team structure needs to be able to handle staff changes
- provide training to help team development, for example in project management
- participation in a team will enhance staff development and morale.

### Encourage and communicate:

- offer incentives for staff to get involved in cleaner production
- fast wins boost team morale (but take care not to miss greater opportunities in haste)
- recognise and celebrate achievements
- communicate achievements and progress to everyone in the company, through email, newsletters, meetings and so on.

### Allocate time and resources:

- if time and resources are limited - be focussed
- make sure staff get the time stated in their job descriptions for cleaner production responsibilities, and that other work doesn't take over
- if cleaner production meetings cannot be in work hours, offer a genuine reward - such as boardroom refreshments!
- allow time and resources (such as access to records) for waste assessment
- allow time for off-site meetings, such as with a local cleaner production network
- consider providing support from a senior manager, another company, or relevant specialist
- encourage employment of tertiary students to boost resources.

### Help your organisation learn:

- your company's ability to learn new ways of working will be influenced strongly by management style and organisational structure
- consider a team-based management approach, to encourage staff participation and involvement
- introduce staff development options such as team building, training and accountability.

### Have an environmental management system

- an environmental management system such as ISO14000 can help embed cleaner production into your company's way of thinking and working
- conversely, cleaner production strengthens an environmental management system by providing tools to achieve targets and implement policy
- consider an in-house or externally accredited environmental management system
- include a cleaner production programme as an integral part of your environmental management system.

### Remember the gains:

- cleaner production improves efficiency, cuts costs and makes your business more competitive
- financial gains often result simply from scrutinising 'what we've always done'
- when the pressure comes on, resist the temptation to discard cleaner production as a 'nice-to-do' - it is much more.

# Looking to the future

Such was the success of Target Zero that it is now being rolled out so that other companies can enjoy the benefits. This second stage is called BusinessCare.

BusinessCare is designed to offer you access to knowledge and expertise to help you improve your environmental and business performance.

As with Target Zero, BusinessCare is all about helping your company introduce cleaner production initiatives - and helping you to establish networks with other companies in your region also involved in cleaner production.

### BusinessCare will provide:

- a core cleaner production training programme for implementation within a local business network
- a national overview of sustainability related activities
- an information clearing house
- links to complementary tools and approaches (such as Environmental Choice, Environmental Management Systems and so on)
- a communications and training network, and
- the collation of results to monitor progress.

BusinessCare resources will become available in the second half of 2000.

For more information on BusinessCare or the information contained in this brochure, contact your local council, or the author at:



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Meridian Energy is pleased to remain involved in the Target Zero work started by ECNZ in 1997. Target Zero has demonstrated the real benefits, both environmental and in reduced operating costs, in adopting cleaner production methods and techniques.

Meridian Energy congratulates the participating companies in taking on the Target Zero initiative and achieving their targets.

New Zealand industry can take a lead from these companies and benefit directly from cleaner production and improved energy efficiency, achieving more competitive production costs, greater productivity and realising improved profits for re-investment in growth.

Meridian Energy is working with these and a number of other energy intensive companies involved in wood processing, food and manufacturing processing to further improve utilisation of process waste and other recoverable materials to produce lower cost energy and reduce unnecessary waste.

We look forward to Target Zero initiatives expanding into new regions and being adopted by more companies throughout New Zealand.

Grant Smith, New Ventures Manager.