

Fonterra and the Environment

2nd Edition



Dairy for life

Sustainability is one of the defining business, political and social issues of the 21st Century. Fonterra's business is based on natural resources, so protecting the environment is integral to our growth strategy.

We are taking steps to improve our environmental performance in every part of our business, not only because the public demand it, but because our future as an industry depends upon it.

Demand for the nutritional benefits of dairy is rising globally and Fonterra is stepping up to meet that demand. As one of the most efficient dairy producers in the world, we must do this while continuing to carefully manage the natural resources upon which our business relies.

Fonterra's sustainable business practices flow through from the cow to consumer. Our priorities are managing the quality and efficient use of water resources, achieving world-leading status as one of the most greenhouse gas efficient dairy producers in the world and reducing waste in every area of our business.

We are working with our farmers to ensure compliance with farm effluent management requirements and on other ways of improving water quality. We're also reducing energy usage and waste in our manufacturing sites. And we have established a team at the highest level of our business who provide governance and leadership for our sustainability targets.

But we have more to do. That's why Fonterra is developing sustainability indicators across our business – on-farm, transport, processing and product and ingredient marketing



– against which we will track our progress, and with which we can help set best international dairying practice.

In this second updated booklet on the environment, we build on the initiatives outlined in the first edition and further demonstrate our tangible environmental progress across our business.

A handwritten signature in black ink that reads "Barry Harris". The signature is fluid and cursive.

Barry Harris
Chairman
Fonterra Sustainability Leadership Team



THE BIG PICTURE

By engaging with other agri-food companies and members of the international dairy sector, Fonterra aims to share knowledge and develop and promote a global understanding of how to best balance dairy farming with protection of the environment. To achieve this, we're working with organisations such as Sustainable Agriculture Initiative Platform (SAI Platform), the International Dairy Federation (IDF) and, through our involvement in the Pastoral Greenhouse Gas Research Consortium, the Livestock Emissions & Abatement Research Network (LEARN).

SUSTAINABILITY WHERE IT STARTS – ON THE FARM

Partnering with our farmers on the environment

New Zealand has many natural advantages, not the least of which is our free grazing system and abundant rainfall.

Fonterra is taking tangible steps to secure an environmentally sustainable milk supply. We are encouraging the uptake of best available practice on-farm to control the loss of nitrates and nitrous oxide, which contribute to declining water quality, and to reduce the methane emissions that exacerbate climate change. We are working with the Government, regional councils, DairyNZ, researchers and community groups to ensure our farmers have the best possible information on which to make their sustainable dairying decisions on things like energy use and effluent management.

Water: Keeping it clean, using less

A clean water resource is something New Zealanders take very seriously and Fonterra is helping our farmers keep waterways clean. The Dairying and Clean Streams Accord (CSA) – a voluntary agreement between Fonterra, regional councils and the Ministries of Agriculture and the Environment – is our cornerstone initiative in this area.

Solid progress has been made toward the Accord's five targets half-way through its eight-year term, but this agreement is by no means the only measure Fonterra is taking to help conserve clean water for all New Zealanders. We're improving the quality of our treated wastewater from our manufacturing plants by minimising production losses and operating our wastewater treatment to best practice standards.



We are also implementing water conservation initiatives and investing in research, extension programmes and capital to ensure we are making the best possible use of this critical resource.

In the 2006/07 season, the national compliance average for dairy effluent management was estimated at a weighted average of 90 per cent across herds in the 13 regions where Fonterra farmers operate, versus the 100 per cent target. Incidences of significant non-compliance with effluent management rules, which have the potential for negative environmental impact, have dropped to an average of about 7 per cent across the 13 regions.

Regional councils have also agreed to work together in the current season to establish a national standard for dairy effluent compliance monitoring and reporting that will allow better year-on-year comparisons and benchmarking between the different parts of New Zealand.

Frustratingly, a small number of our farmers persistently don't comply with regional council effluent standards. We are working one-on-one with them. Through the introduction of our Effluent Indicator System, they now are required to commit to a management plan to improve performance, or face a financial deduction, and ultimately the possibility of not having their milk collected. We currently have a number of farmers within this system.



Primary Sector Water Partnership

Fonterra is part of the Primary Sector Water Partnership – a group of major primary industry groups which are committed to ensuring the sustainable use of freshwater resources. The Partnership aims to make significant improvements in water use efficiency throughout the primary sector over the same time. It currently has some ambitious targets out for consultation:

Nutrient management

- By 2013, 80 per cent of nutrients applied to land nationally are managed through quality assured nutrient budgets and nutrient management plans.
- By 2016, 1.7 million hectares of intensively farmed land will have implemented nutrient management plans.

Industry benchmarks of water use

- By 2016, 80 per cent of extracted water used by the partners will be self-managed to meet industry “good practice” benchmarks for water use.

Sediment and microbial management

- By 2010 all forestry land, and by 2016 1.7 million hectares of intensively farmed land, will have implemented a management programme to minimise microbial and sediment deposits in waterways.

80

PER CENT

We aim that by 2013, 80 per cent of nutrients applied to land throughout the country are managed through independent quality assured nutrient budgets.



ONE-ON-ONE ADVICE

We are providing individual farmers with one-on-one advice on how to be compliant with the Accord. For example, through the Canterbury Effluent Management Compliance Project we have contacted and/or visited all the significant non-complying farmers in the region. Where needed, we have also commissioned an agricultural engineer to provide effluent system design advice. We have mirrored the approach adopted in Canterbury in Northland and parts of the Waikato.

We were particularly pleased with the progress made over the last year in keeping stock out of waterways. Eighty-three per cent of dairy cattle are now excluded from waterways and 97 per cent of regular crossing points have bridges or culverts, exceeding our 50 per cent targets for 2007. We are also making solid progress toward our nutrient management target. With the help of the fertiliser industry, 97 per cent of farmers now have a nutrient budget, which saves many of them money. One Waikato rural consultant has saved his 200 customers an average of \$11,000 each in fertiliser costs by advising them on the most effective time to apply just the right amount of fertiliser.

Nutrient budgets have significantly raised awareness of the need to only apply the quantity of fertiliser needed to meet pasture growth requirements – and no more. In the coming years we're working with our suppliers to turn these budgets into full nutrient management plans, which will further reduce the impact of nutrient loss on the environment. These plans are being implemented in the Waikato (above the Karapiro Dam) and will be rolled out in the Manawatu–Wanganui region (Horizons Regional Council) and elsewhere in the country.

Together with the Primary Sector Water Partnership, a group of major primary sector organisations, we're developing even stricter water quality and use targets. We aim that by 2013, 80 per cent of nutrients applied to land throughout the country are managed through independent quality assured nutrient budgets and management plans. (See story on Page 03).

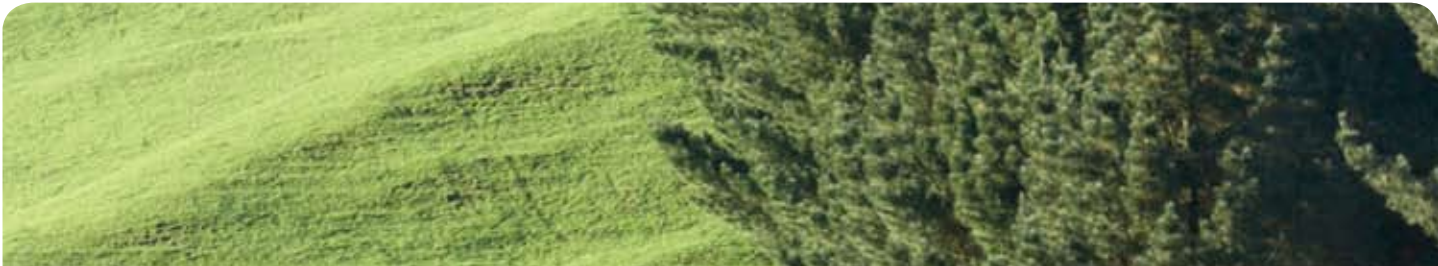
Fonterra is working with regional councils to encourage our farmers to plant riparian margins along waterways to prevent nutrients, including fertiliser and effluent, from flowing into them.

In Taranaki, for example, Taranaki Regional Council has led a programme to protect existing or establish new riparian planting along 17,500 kilometres of stream banks.

The success of this programme, along with the region's robust compliance programme and community partnership approach to environmental management, showed during the 2007/2008 dry summer in Taranaki. Stream temperatures and biological stress were noticeably lower at 16 sites monitored in the region during this time using a macro-invertebrate biological index.

But still more needs to be done to resolve our water quality challenges. DairyNZ is managing around \$10.5 million of industry and government funding per annum to deliver environmental tools, including those for new nutrient management.

Fonterra is working with our farmers who use irrigation to lift their water awareness and make more efficient use of water for irrigation. We're exploring ways to increase in-shed water use efficiency and providing information to farmers to allow them to improve their systems.



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COLLECTION OF CHEMICALS ON-FARM

Agpac's product stewardship scheme, which Fonterra has helped fund and promote, offers a silage wrap collection service to a growing list of participating farmers. More than 40 farmers in the Taranaki and Waikato regions have helped to recover more than 11 tonnes of used silage wrap for recycling, that would have otherwise been burnt or buried on-farm.

The network of collectors throughout New Zealand now stands at 33, spread from Kaitaia to Gore. A collection service has begun in Westland and new collectors are being put in place at Wanaka and Alexandra.


Fonterra is also a trustee of the Agrecovery Foundation, which in its first year set up almost 50 container collection sites throughout New Zealand and collected an estimated 80,000 plastic agrichemical containers from farms and orchards.

The next step for the Foundation is to roll out a Chemical Recovery Programme in conjunction with regional councils for the recovery and safe disposal of expired and unwanted chemicals from agriculture. Investigations are also underway to develop an alternative nationwide system to recover silage wrap plastic.



We have implemented an eco-efficiency programme across our New Zealand production sites, stores and offices to reduce the environmental impact of manufacturing waste through elimination, reduction, recycling, re-designing operational systems and re-using non-recyclable materials.





STEPPING UP IN MANUFACTURING

Worldwide focus on recycling and reducing waste

Around the world, Fonterra is focused on reducing waste at all of its sites, offices and facilities. We're lifting awareness amongst our staff of the need to cut the use of paper and plastic throughout the 140 countries in which we operate and we're recycling in many of these.

Fonterra's New Zealand and Australian businesses are signed up to national packaging agreements. These initiatives are designed to minimise the environmental impacts from used packaging, conserve resources through better design and production processes and ensure the re-use and recycling of used packaging materials.

Fonterra Australia is measured annually against key performance indicators, such as the ratio of tonnes of packaging versus tonnes of product, and tonnes of recyclable packaging versus total tonnes of packaging.

We have implemented an eco-efficiency programme across our New Zealand production sites, stores and offices to reduce the environmental impact of manufacturing waste through elimination, reduction, recycling, re-designing operational systems and re-using non-recyclable materials. Mid-2007 we hit our national target of 75 per cent reduction in waste to landfill, and by June 2008 we achieved 84 per cent – representing savings of more than 1,800 tonnes in just one year. We're well on the way to reaching our 90 per cent goal by June 2009.

Recycling is good, but eliminating or using less packaging and resources is even better. So we're working across New Zealand with our packaging suppliers, recyclers, waste companies, the Ministry for the Environment, the Packaging Council of New Zealand, and WasteMINZ to find ways of further improving our environmental footprint.

Here are some of the ways Fonterra is reducing waste in New Zealand:

- Some dairy products have a very short shelf life; once the best before date is reached these products need to be disposed of in landfill. We are now recycling and reusing all our expired or end-of-run product into the animal nutrition market – cutting the amount of our total waste to landfill.
- Fonterra is trialling recycling facilities in public places, alongside the Ministry for the Environment. As a member of the New Zealand Packaging Accord sector group Environmental Business Action Group (EBAG), Fonterra has helped install some 60 recycling bins in Auckland's Manukau City and has promoted a system to further improve public place recycling throughout New Zealand.
- EBAG, in conjunction with the Taranaki Arts and Festival Trust, the Taranaki Regional Council, the New Plymouth City Council and others, achieved an 86 per cent recycling rate at this year's annual World of Music Art and Dance (WOMAD) event. Fonterra organised sponsorship and the day-to-day management of the systems and volunteers to implement the recovery programme. The group was awarded an Environmental Award for an outstanding job on education and resource recovery. The goal for the next WOMAD three-day event is for zero waste.

PACKAGING - THE NEW ZEALAND NUMBERS

115

tonnes of plastic per annum we saved as a result of re-designing our 20kg cheese bags

75,000

standard wooden pallets taken out of our pallet pool in the last 18 months through management



- Fonterra has installed balers at its sites to sort and compact cardboard and plastic for recycling, leading to greater transportation efficiencies and lower costs. This has resulted, for example, in the recovery and recycling of an average of 180 tonnes of cardboard and 65 tonnes of plastic per month from our New Zealand sites of Eltham and Canpac alone that previously would have gone to landfill.
- We're now recycling approximately 100 tonnes a year, or 50-60 truck loads, of plastic bottles through the use of a new milk sample bottle. The sample bottles are all sent to the testing laboratory, where the milk is automatically sampled and the bottle is then shredded and sent to Auckland to be reprocessed into pots and planters – doubly benefiting the environment.
- Fonterra also has eight worm composting units throughout its New Zealand sites. Food scraps from lunchrooms are munched up by the worms, and the resultant fertiliser is used to grow plants and trees around the factories.



40,000

wooden pallets per year we now don't export by moving away from a custom-built one tonne container for cream products to a completely reusable steel container that has an integral pallet

2,400

tonnes of paper we saved in the same exercise

430

tonnes of paper saved this season through reduced packaging waste in our powder packing areas

Reducing resource and energy use

Fonterra globally is using resources more efficiently as part of our efforts towards being a more sustainable co-operative. The energy efficiency drive at our NZ-based manufacturing sites has now reduced the energy consumption per unit of production by 15 per cent since the 2002/03 season.

This energy reduction is equivalent to the total annual electricity use of around 100,000 households and with Fonterra's energy mix is a reduction of carbon emissions of 230,000 tonnes per annum.

Meanwhile, Fonterra Australia will participate in the upcoming National Greenhouse and Energy Government's Energy Efficiency Opportunities initiative. This is designed to identify and encourage the adoption of cost-effective energy efficiency opportunities, boost productivity and reduce greenhouse gas emissions.

Fonterra and its legacy companies have been reporting company-wide carbon dioxide, or CO₂, emissions information to the Australian Greenhouse Office since 1998, as part of the original Greenhouse Challenge programme established in 1995.

Here are some ways we're saving energy and other resources around the world:



NEW ZEALAND

- Our **Edendale** site (above) managed a 13 per cent reduction in energy consumption in the last three seasons. It also cut waste to landfill by 35 per cent, achieved a 20 per cent reduction in water consumption to milk ratio and a 6 per cent improvement in boiler efficiency.
- The **Te Awamutu** site has also made good progress on reducing waste to landfill – from 153 tonnes in the 2006/07 season to 86 tonnes the following season. The site recycles steel drums, butter wrap, salt and powder bags, cardboard, plastic, aluminium cans and bag liners. Te Awamutu aims to reduce its waste to landfill by another 10 per cent in the 2008/09 season. The site has reduced its energy usage by almost 10,000 megawatts in two seasons.



- The **Clandeboyne** site (above) reduced carbon dioxide emissions by 33,000 tonnes. This was achieved through energy efficiency initiatives, such as the optimising of boiler combinations to match seasonal milk loads. If the cost of carbon is based on \$25 per tonne, then this equates to a \$825,000 reduction.
- Fonterra's Awaroa dairy farm at **Edgecumbe** is using a New Zealand solar energy system to heat the water that is used for cleaning the milking plant, which typically accounts for 30 per cent of farm dairy electricity use. While this trial is continuing to collect data, the findings to date suggest the solar system achieves energy savings sufficient to give a six-year payback on the investment.

USA

- DairyConcepts, Fonterra's joint venture with Dairy Farmers of America, has cut its drying energy usage by 20 per cent at its **Allerton**, Iowa site.

NORTH ASIA

- Use of air conditioning is curbed during the hot summer months in **Japan** and **South Korea**, allowing male staff to go tie free. Japanese employees can also take advantage of flexi-time and staggered working hours to avoid the worst of the heat in summer. Fonterra **Philippines** now saves at least two hours of air conditioning a day through shifting to regular office hours, as part of its initiatives under project Conserve.

AUSTRALIA

- Our **Wagga Wagga** site in New South Wales has managed a significant reduction in both solid waste to landfill and recyclable plastic being generated by the site. The quantity of plastic sent to recyclers was down by almost 20 per cent and solid waste was cut by almost 15 per cent.
- Our **Dennington, Cobden, Cororooke** and **Darnum** sites have submitted their initial WaterMAP plans to the Victorian Environmental Protection Authority (EPA), identifying savings of more than 1.2 million litres of water per day for 2008 and beyond. This will be achieved through replacing aging equipment, the capture of storm water for site maintenance and other initiatives.
- At **Stanhope**, making more efficient use of its compressed air system avoids 152 tonnes of carbon dioxide emissions each year. The site also saves 630 tonnes of emissions a year by optimising the aeration of its the waste-water treatment lagoons.
- **Darnum** reassessed some of its hot water requirements and substituted them with cold – saving 70 tonnes of greenhouse gases per year.

EUROPE

- Our office in **Hamburg, Germany**, incorporates a lot of energy efficient features such as high technology windows which allow good air circulation and are also double glazed for insulation. This means the office operates without air conditioning and uses only energy efficient radiator-type heaters in the sub-zero temperature of winter.

MOTOR BOUNTY SCHEME

Following its compressed air system energy efficient investments at Te Rapa and Edgecumbe, Fonterra is pursuing further efficiencies through participating in the Electricity Commission's Compressed Air Systems Efficiency Programme. Through this, Fonterra has embarked on compressed air systems audits at Tirau, with other sites at Pahiatua, Longburn, Whareroa and Kapuni) and Takanini that will yield attractive electricity savings.

Fonterra is also participating in the Commission's Motor Bounty Scheme, which pays bounties to motor users to replace their old electric motors with more efficient that meet the Minimum Energy Performance Standards 2006. More than 20 motors are likely to be replaced throughout Fonterra in 2008 and there is the potential for several hundred more to be upgraded over the next few years.



EDENDALE: ENVIRONMENTAL EXCELLENCE MADE EASY

At our Edendale site, one successful environmental project is the installation and operational development of a pressurised boiler baghouse.

The resource consent held for the three Edendale boilers permits the discharge of some contaminants to the air, as long as they do not exceed 350 parts per million (ppm). In 2005 the typical emission rate was around 320 ppm. A baghouse installation on two of the boilers in 2006 saw emissions more than halved to 136 ppm. Resolving some operational problems and plugging a bypass leak further cut emissions to 18 ppm in 2007. This result is being maintained and the site was recently rewarded for its efforts with the Clean Air Society of Australia Award and New Zealand Clean Air Award for 2007.



A FOCUS ON WATER

To improve the quality of our treated wastewater, Fonterra invests in research and capital to ensure that treatment technology is best practice, meets regulatory requirements and community expectations and minimises any environmental impact from our wastewater discharge.

Many of Fonterra's manufacturing sites throughout New Zealand irrigate treated wastewater onto surrounding land. This recycled wastewater contains nutrients at levels useful to promote pasture growth.

At several sites we have developed wastewater treatment processes which have cut the nitrate levels of treated wastewater when it is discharged to a waterway, also saving on energy use.

Our Te Awamutu site has achieved a 9 per cent reduction in its water use compared to the previous season, through installing a more efficient drier and a hot water recirculation system, reusing evaporator condensate streams, centralising the milk treatment process and replacing wet vacuum pumps with dry ones.

We are installing a new wastewater treatment facility at our Stirling site to improve the quality of New Zealand's largest river, the nearby Clutha River. This \$12 million

membrane biological reactor plant is the first of its kind for the New Zealand dairy industry and will lift the site's wastewater treatment process to the highest of international standards.

Firstly a Dissolved Air Floatation (DAF) unit removes solids, fats and protein from the waste. Then bacteria digest organic components in the wastewater. Finally, water is passed through an ultra-filtration system that removes any remaining solid material and bacteria in the wastewater.

Similar DAF plants are soon to be installed at our New Zealand sites of Longburn and Morrinsville, and also in Wagga Wagga in New South Wales.

Water conservation initiatives at the New Plymouth Coolstore site have resulted in a first for Fonterra in New Zealand – a site which does not need water from an external source to operate. Water is used as a cooling medium to keep the Coolstore's refrigeration system operating effectively. In the past, the site drew water out of the nearby Mangaotuku Stream, used it for cooling the condensers, then shifted the water to a pond on-site before final discharge to Ngamotu Beach.

But now the Coolstore meets all its cooling needs without taking stream water. It manages this by cycling



water through a holding pond (which receives stormwater and seepage) and passing this through the cooling tower then back to the pond. The stormwater and seepage exceed the evaporated volume – leaving the site self-sufficient in its water use.

The Te Rapa manufacturing site has cut its production losses into the wastewater plant from milk processing by 45 per cent over two seasons. New technology, monitoring, data analysis and a permanent loss reduction technician and higher staff awareness have all contributed to this impressive reduction.

Our Edendale site has reaped significant rewards from management's emphasis on integrating environmental matters and areas of potential improvement into the site's business plan (See separate box – Edendale: Environmental excellence made easy). Edendale has managed a 20 per cent cut in water consumption to milk ratio this season and has also reduced the number of product losses.

Optimising the site's waste water irrigation system has reduced groundwater nitrate levels by more than 6 per cent over the past 12 months. Further improvements are being worked on.

Fonterra is close to concluding a major study of sustainable options for the treatment and disposal of high strength waste generated by our manufacturing sites in the Waikato. These waste streams are currently spread onto land or used as stock food. Fonterra is in final stages of investigating the anaerobic digestion of this waste which, if adopted, will be a major change from current practice.

Our DairyConcepts joint venture in the United States managed to save approximately 200,000 litres of water a day through replacing a water-cooled air compressor at its El Dorado Springs site in Missouri.



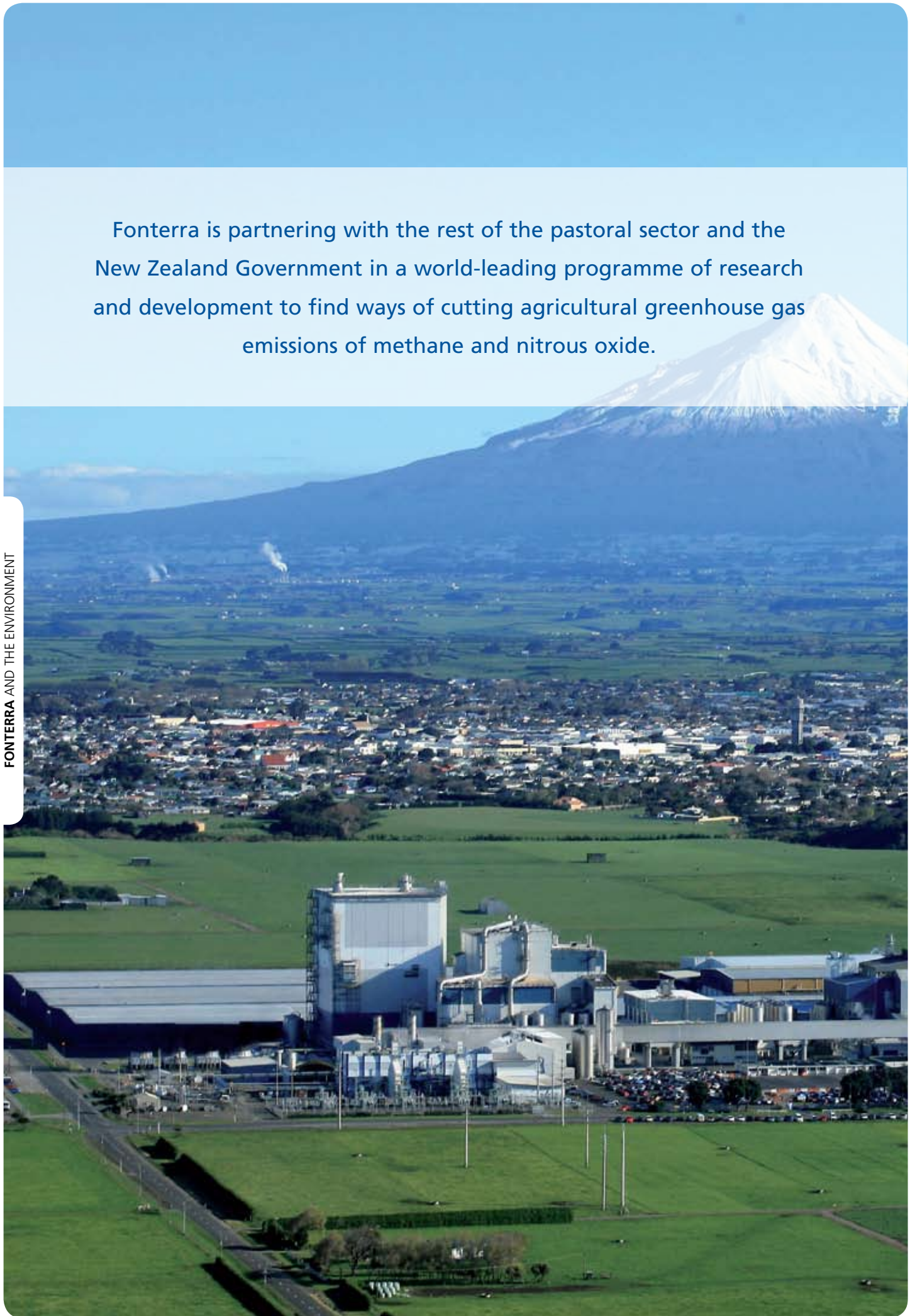
Squeezing every last drop at Darnum

The Darnum milk processing facility in Victoria, Australia is an example of how Fonterra combines environmental factors into its decision making. From the design and development of the plant, the underlying philosophy of Fonterra's operations at the site is that good environmental performance makes good business sense.

The facility can process over three million litres of milk per day, around 87 per cent of which is water. During the milk evaporation process, a large percentage of this water is captured as condensate. Through a reverse osmosis water filtration process, we purify this condensate water, which is then used to wash the production plant. In this way we reduce our reliance on town water procured through Gippsland Water.

Once the water has been used for cleaning, it is pumped into one of two 100-megalitre treatment lagoons, where the water is treated to improve its quality. It is then used to irrigate approximately 100 hectares of farmland and 20 hectares of local blue gum plantation.

Fonterra is partnering with the rest of the pastoral sector and the New Zealand Government in a world-leading programme of research and development to find ways of cutting agricultural greenhouse gas emissions of methane and nitrous oxide.



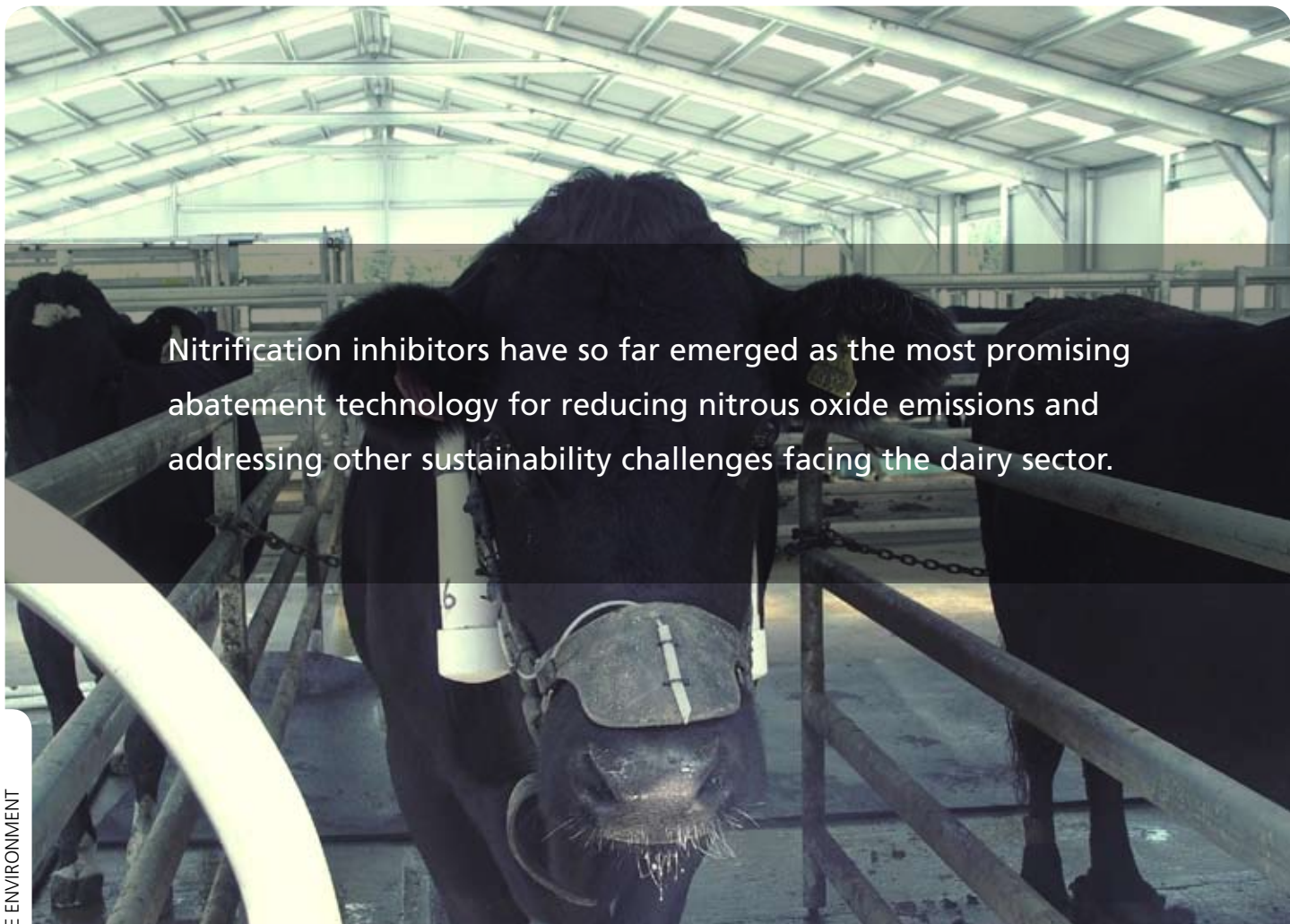
GETTING TO GRIPS WITH GLOBAL WARMING

Governments, businesses and individuals around the world are looking for ways to reduce the greenhouse gas emissions that cause climate change. Fonterra is implementing initiatives across the business to help the fight against climate change. We are partnering with the rest of the pastoral sector and the New Zealand Government in a world-leading programme of research and development to find ways of cutting agricultural greenhouse gas emissions of methane and nitrous oxide.

Australia last year ratified the Kyoto Protocol and New Zealand is one of a number of other developed countries adopting an emissions trading regime. New Zealand's Emissions Trading Scheme (ETS) differs from others in that it is the first scheme in the world to include agricultural greenhouse gas emissions.

Depending on how the policy finally shapes up, either each of our farmers individually, or Fonterra on their behalf, will be obliged to report their on-farm emissions in 2012. And either Fonterra, or all of our farmers, will be financially liable for some part of their emissions when full pricing of those from agriculture is phased in from 2013. But before then, some challenges must be overcome.





Nitrification inhibitors have so far emerged as the most promising abatement technology for reducing nitrous oxide emissions and addressing other sustainability challenges facing the dairy sector.

INVESTING IN THE FUTURE

The agriculture sector and the Government have already invested heavily through the Greenhouse Gas Research Consortium:

\$15m

SINCE 1992 AND THEY HAVE COMMITTED A FURTHER

\$25m

BY 2012 IN CLIMATE CHANGE WORK.

The agricultural industry is working with the Government to ensure there are the means available to estimate and monitor emissions from farms. The Government is also working hard to gain international recognition of viable mitigation technology such as nitrification inhibitors.

The agriculture sector and the Government have already invested \$15 million since 2002 and have committed to a further \$25 million by 2012 in climate change work through the Pastoral Greenhouse Gas Research Consortium (PGgRC), which Fonterra helps fund and currently chairs (this is in addition to the more recently announced government Agriculture Plan of Action and Fast Forward funding). It's proving to be money well spent. Earlier this year the Consortium had a major research breakthrough – cracking the world's first genetic sequence of a microbe which produces methane from the rumen of livestock.

This breakthrough will allow the Consortium to advance its search for ways of reducing the amount of methane farm animals produce – which accounts for almost a third of New Zealand's total greenhouse gas emissions. The PGgRC programme of research and development is considered to be the most comprehensive of its kind in the world.

Still, the Consortium believes it is probably five years away from finding a practical solution to reduce methane emissions, and another decade before such technology would be cost-effective enough to be widely adopted by farmers. At that time we believe science will allow us to produce more meat and milk while producing substantially less methane.

Nitrification inhibitors can increase pasture growth while lowering nitrous oxide emissions and nitrate leaching into waterways, with tests showing 30-70 per cent lower nitrous oxide production through their use in some regions and under ideal conditions.

Trials have also shown that nitrification inhibitors can improve pasture growth by an average of between 4–6 per cent under the very best conditions, but results are variable.



Greater efficiency in on-farm energy use

All New Zealanders are being encouraged to use less electricity and farmers are no different. Reduced energy consumption on-farm has major environmental benefits as well as saving money.

Tools already available include the use of hot water cylinder insulation, energy efficient lighting, variable speed drives for milk pumping, vacuum pumps and heat recovery systems – and, of course, operating existing assets more efficiently.

Fonterra, and industry partners the Energy Efficiency and Conservation Authority, the Ministry of Agriculture and Fisheries and DairyNZ, recognise that one-on-one advice is key. They are developing an ambitious regional pilot programme which, if successful, may be rolled out nationally.

Under this proposal, each farmer will receive a customised Energy Action Plan and accompanying business model through which energy efficiency recommendations can be met. This will have the multiple benefits of lowering their carbon footprint, improving the sustainability of New Zealand dairy products and reducing farmer exposure to rising energy prices and carbon emission charges.

The Emission Account

Fonterra is in its third year of simulating its own emissions trading scheme – the Emission Account.

The Emission Account compiles data about each manufacturing site's carbon dioxide emissions every quarter, assigns them a hypothetical dollar value and incentivises their reduction. It is sent out to all managers and energy efficiency promoters at each site for display on staff notice boards, encouraging friendly competition between sites. Six reports have been published to date – recording emissions for each site and for Fonterra's New Zealand operations as a whole.

Fonterra's scheme has been modified so it's more closely aligned with the Government's proposed Emissions Trading Scheme, which is to be phased in in coming years. So we're pricing our carbon units close to the Certified Emission Reduction (CER) unit price in Europe, which will likely influence pricing to be adopted in New Zealand from next year.

Fonterra's Emission Account indicates the net cost to Fonterra's manufacturing activities if we were operating in 2010 under the ETS. This proactive approach means we're going to be in a good position to administer our part of the scheme by the time the ETS is introduced.

Targeting transport and supply chain

As our milk makes its journey from the cow to customers around the world, there are big emissions savings to be made in the transporting and distribution of our finished products. We have in recent years made much greater use of New Zealand's regional ports, significantly reducing the footprint associated with land-based transport of road and rail.

But when we must move our goods by land, we're increasingly favouring the use of rail over less fuel and energy efficient road transportation. Today about half of Fonterra's finished goods move by rail. Plans are now being drawn up to increase this further to as much as 80 per cent of transport movements. This would materially lower Fonterra's domestic emissions.

We're also working more closely with our transport providers to find other ways of making the movement of goods around the country more efficient.

Technology is helping too, with our recent adoption of Logic Tool's Logic Net supply chain modelling tool. This industry leading software allows us to strategically model and re-design our global supply chain to minimise costs and carbon emissions.

Parts of our business, along with our logistics partners, are testing and rolling out new technologies to improve the load utilisation of our road transport – so we can get the most out of each trip. This technology includes the use of new planning software, so we can travel fewer miles when we pick up our milk.

We're upgrading our warehouses to larger, more modern and efficient buildings. Our warehouses have historically been relatively small and the refrigeration in many of these is aging. The new Crawford St Coolstore in Hamilton is an example of a facility that will not only cut truck movements by 45,000, but will also have a new efficient refrigeration plant.

Across New Zealand, we're using brand new Scania trucks which are at the forefront of fuel efficiency. All trucks

we buy are up to Euro 3 emissions specification (standards which set limits for exhaust emissions of new vehicles sold in the European Union) and we're now trialling a Euro 4 model. We plan to go up to Euro 5 when it becomes available in this country.

We are also in the process of refurbishing the trailers that our trucks tow. The trailers are now able to pull 50 tonnes worth of steel, which will lighten each trailer by about 900 kilogrammes and allow them to carry more – lowering costs and distances travelled. This will be rolled out over the next few months with more than 65 trailers.

We will further this with a trial of up to 60 tonnes of steel, along with the Government, over the next six months or so – to test the impact on roads, bridges and aspects such as road safety.

In Australia, Fonterra has 80 milk tankers collecting almost 2 billion litres of milk off-farm annually. We have been converting the smaller tankers in our fleet to a larger b/double model, which hold 25 per cent more milk. Larger tankers have two articulation points and more wheels, so they're lighter on the wheel grouping and less likely to damage a farmer's track.

Half the Australian fleet now has the higher loading limit, which equates to a 25 per cent reduction in the number of trucks on the road. The result is about 15 per cent less fuel used per litre of milk collected, lower manpower costs, less weight on the roads and a reduced chance of meeting a truck on a windy country road.

We're in the process of upgrading our milk tanker fleet across Australia from Euro 3 emissions specification to Euro 4, which is at the forefront of fuel efficiency. And we'll soon be shifting tanker leases, as they come up, to Euro 5 – cutting the amount of soot and nitrous oxide emitted from exhausts.

Fonterra Australia has recently moved to a preference for LPG fleet cars nationally. With 91 LPG cars currently, Fonterra has reduced CO₂ emissions by 35 tonnes annually. The phasing out of more than 100 more petrol cars will save another 45 tonnes of CO₂ annually.



Partnering in the community

Fonterra is involved in many community partnerships, in recognition of the role our business plays in local communities.

Some examples of where we partner with community groups:

- Fonterra has continued its partnership with Keep New Zealand Beautiful through support for the September clean-up week, the country's biggest public participation event. We also sponsor the 'Volunteer of the Year' award.
 - New Zealand's Clandeboye site made a grant to the Salmon Enhancement Trust, helping with the cost of establishing a hatchery for raising fish stock. Employees at Clandeboye also assisted the trust in planting 800 native trees in April.
 - The Hautapu site sponsored a native garden for the local Hautapu School.
 - The Te Awamutu site participated in two tree planting days co-ordinated by the Lower Mangapiko Streamcare Group. The site also sponsored a vermin-composting unit and science award for the Te Awamutu College and sponsored a local school for its Trees for Survival Programme.
 - Our Edendale site provides heating for the local Edendale Primary School pool to extend its swimming season. The site also donated chemical spill kits to the Edendale Voluntary Fire Brigade. And two scholarships have been established to allow students to pursue university studies and gain experience in the dairy industry.
 - Some of our environmental teams have used funds from winning environmental awards and the selling of scrap for the construction of community walkways and plantings on company farms.
 - We have provided education and advice to a large number of organisations on what we've learnt from our environmental initiatives, so that they also can help improve New Zealand's environmental footprint.
- Across the Tasman, our Dennington site in Victoria, along with Wannan Water and the Warrnambool Golf Club have together introduced an innovative water conservation scheme that replaces the use of the city's drinking and bore water supplies to irrigate the golf course. Condensate produced during the manufacture of milk powder from Dennington is now diverted to the golf club. The water collected is then used to irrigate the course, conserving some 100 megalitres a year of precious drinking water for the local area and townships.
 - Dennington also helps fund the return of the nearby Merri River to its native state. A five-year programme, led and managed by the site, has seen the river banks adjacent to the factory cleared of invasive willows. Native trees and vegetation have been replanted and access areas for the local community created.
 - Earlier this year, staff from our Mt Waverley, Balcatta, Spreyton and Bayswater sites volunteered to clear rubbish from local parks and reserves for Business Clean Up Day - part of the Clean Up Australia programme.





AWARDS

2008

New Zealand Clean Air Society awarded its annual Clean Air Award to Fonterra Edendale for successfully lifting its environmental performance to the highest standards, with its installation of a pressurised boiler baghouse.

Ecolab Eco-efficiency Award (New Zealand Institute of Food Science and Technology Inc), awarded to Hautapu site for environmental efforts.

Edendale also took the Highly Commended honour within the Environment Achiever category at the Environment Southland Awards.

Brock and Janine Fiske - the sharemilkers on Fonterra's Hautapu farm - picked up the Meridian Energy Farm Environment Award at the National NZ Dairy Industry Awards.

2007

Packaging Council of New Zealand awarded Fonterra the Special Achievement Award for its Eco-Efficiency Programme.

Ecolab Eco-efficiency Award (New Zealand Institute of Food Science and Technology Inc), awarded to Hautapu site for environmental and waste reduction efforts.

EECA Contact Energy Management Award for the Fonterra Energy Project Management team's successful efforts in cutting the company's energy consumption by 10 per cent.

EECA Transpower Project Innovation Award for Fonterra Whareoa's heat recovery project.

2006

Ecolab Eco-efficiency Award (New Zealand Institute of Food Science and Technology Inc), awarded to Clandeboye site for eco-efficiency.

Target Zero Special Award for Business Resource Use Efficiency (Environment Canterbury, Landcare Research, Energy Efficiency Conservation Authority and Christchurch City Council), awarded to Clandeboye site for eco-efficiency.

Commercial/Industrial Environmental Award (Environment Canterbury), awarded to Clandeboye site for eco-efficiency programme and wastewater irrigation (category joint winner).

Taranaki Regional Council Industry Environmental Enhancement Project Award, awarded to Whareroa site for work on the Nowells Lake wetlands.

Sustainable Business Network award for innovation (both local and national levels), awarded to our Tirau site for anoxic tank modification for nitrate compliance.

2005

National Bi-annual Environmental Impact Award (New Zealand Packaging Council), awarded to Fonterra's Eco-Efficiency Programme.

Ecolab Eco-efficiency Award (New Zealand Institute of Food Science and Technology (Inc)), awarded to Clandeboye site for eco-efficiency.

Best Zero Waste Partnership Project, awarded to Clandeboye site for our eco-efficiency programme.

2004

Star Award-Slash Trash (Whangarei District Council), awarded to our Maungaturoto site for outstanding effort in waste minimisation.

Environment Business Award (Waikato Business Network), awarded to our Te Rapa site for implementation of environmental management systems and ISO 400.

Large Industry Environmental Award (Tasman District Council), awarded to Takaka site for waste, irrigation and ISO 400.

Massey University Corporate Environmental Awards, awarded to Fonterra for environmental responsiveness.

For more information regarding Fonterra's environmental initiatives please contact:



Dairy for life

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