



Environmental Sustainability Scorecard 2015/16

A Dairy Australia report on behalf
of the Dairy Manufacturers
Sustainability Council

**Australian dairy
companies working
together for a
sustainable future**

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Our scorecard

Minimising our environmental footprint

Reporting by the Dairy Manufacturers Sustainability Council (DMSC) contributes to tracking industry progress against the Australian Dairy Industry Sustainability Framework under 'Reducing our environmental impact' – targets 9, 10 and 11.

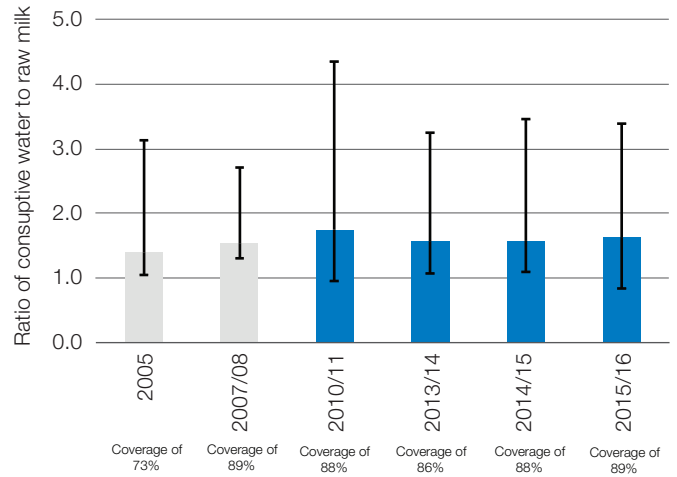
Target 9

Reduce the consumptive water intensity of dairy manufacturers by 20%

Performance indicator

9.1 Consumptive water intensity of dairy manufacturers (litres per litre of milk processed)

Baseline (2010/11)	2016 (result)	2016 (% change from previous year)	Progress (since 2010/11)
1.75	1.62	3% increase ▲	7% decrease ▼



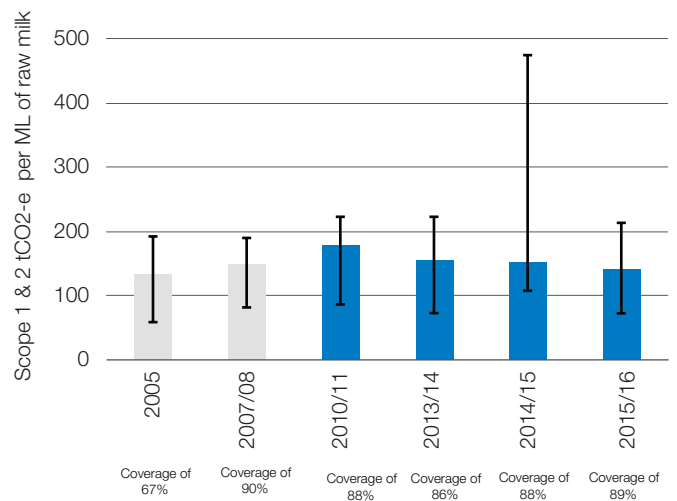
Target 10

Reduce greenhouse gas emissions intensity by 30%

Performance indicator

10.1 Emissions from dairy manufacturers (tonnes of CO₂ equivalent per ML milk processed)

Baseline (2010/11)	2016 (result)	2016 (% change from previous year)	Progress (since 2010/11)
178.7	140	8.2% decrease ▼	21.7% decrease ▼



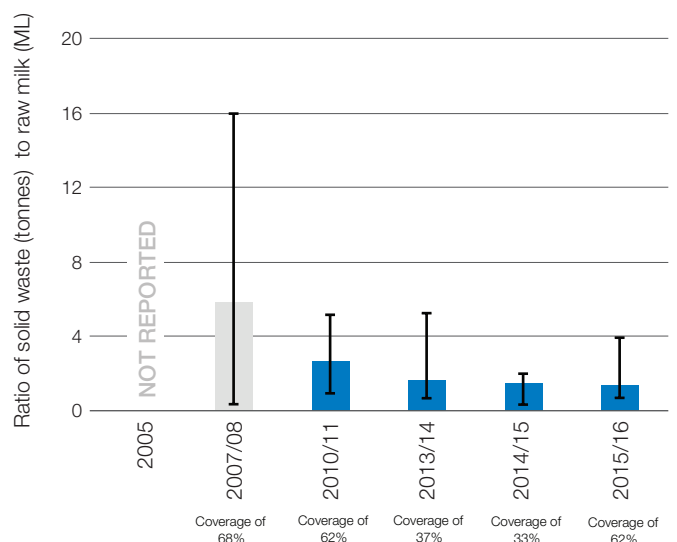
Target 11

Reduce waste to landfill by 40%

Performance indicator

11.1a Waste to landfill intensity of dairy manufacturers (tonnes of waste per ML milk processed)

Baseline (2010/11)	2016 (result)	2016 (% change from previous year)	Progress (since 2010/11)
2.69	1.39	4.5% decrease ▼	48.4% decrease ▼



Executive summary



This is the fifth time the Australian dairy manufacturing industry has published its performance in environmental sustainability. Covering the financial year 2015-16, this scorecard compares the industry’s performance against environmental data previously published for 2004–2005, 2007–08, 2010–11, 2013–2014 and 2014–2015 where possible.

The scorecard draws on information gathered for reporting against the Australian Dairy Industry Sustainability Framework and the environmental targets outlined in that Framework. This relationship is outlined in the diagram below.

The data is based on the aggregated information provided by participating members of the Dairy Manufacturers Sustainability Council (DMSC). Some performance measures have been changed to enable alignment with the Framework which was adopted in 2012. While we continue to improve the integrity of data we are also

expanding the information we report. This year, for example, we have included performance data on waste water, waste diversion and energy intensity.

It is important to note that changes in resource consumption in the sector are highly influenced by the sector’s product mix. Factories producing fresh milk will use energy and water and generate waste differently to factories which focus on the production of cheese, yoghurt or milk powder. Changes to the overall national product mix will therefore influence some of the trends.

This year, the consumption of water increased by 3% to 1.62 litres of water per litre of milk processed. This represents a 7% decrease over the baseline of 2010–2011 and against our target of an overall reduction of 20% by 2020. Meanwhile, greenhouse gas emissions intensity decreased by 8.2% from the previous year with an overall trend of a 21.7% reduction since 2010–2011, toward a target of a 30% reduction by 2020.

Australian dairy manufacturers produced an estimated 1.39 tonnes of waste to landfill per million litres or megalitre (ML) of milk processed this year, achieving a 48.4% reduction in waste intensity since 2010-2011. Some of this reduction is due to more accurate measurement and monitoring of waste data since 2010-2011. The DMSC members have started collecting data on a greater variety of waste streams. This year results for waste water and a waste diversion rate have been included and we expect to include more waste streams in future reporting cycles. We are also monitoring the work of our peers in Europe and North America, where organisations such as Dairy UK conduct environmental benchmarking activities among manufacturers and report on progress against targets.

Scorecard focus: Dairy manufacturers’ contribution to reducing environmental impact



Enhancing livelihoods

Improving wellbeing

Reducing environmental impact



The DMSC aims to reduce:

- > consumptive water intensity
- > greenhouse gas emissions intensity
- > waste to landfill

Introduction and methodology



The information disclosed in this report was largely drawn from data gathered as part of a DMSC members' engagement program. An excel spreadsheet was distributed to DMSC members requesting information regarding: milk volume processed, product output, water consumption, greenhouse gas emissions, energy consumption, waste generation, waste diversion and waste water generation for the 2015–2016 financial year. A total of seven manufacturing companies contributed environmental performance data – six members of the DMSC and one non-member of the DMSC.

The coverage of data for each parameter by volume of milk processed nationally is noted in the text. (e.g. data on water intensity reflects 89% of the volume of milk processed nationally). None of the data presented in the scorecard has been independently assured or audited although some of the raw data may have been audited by the participating companies for other purposes (e.g. compliance under the National Greenhouse & Energy Reporting Act 2007).

Members of the DMSC in 2015/16 were:

- › Devondale Murray Goulburn Ltd
- › Fonterra Australia Ltd
- › Parmalat Australia Ltd
- › Warrnambool Cheese and Butter
- › Bega Cheese Ltd
- › Burra Foods Pty Ltd
- › Norco Co-operative Ltd
- › Bulla Dairy Foods Pty Ltd

Dairy Manufacturers Sustainability Council members participating in the 2015/16 report



Scorecard targets

Target 9 **Reduce the consumptive water intensity of dairy manufacturers by 20%**

The dairy industry relies heavily on the availability of water. In manufacturing, cleaning is the single largest water-consuming process, driven by product safety requirements.

Dairy manufacturers are continually looking at options to reduce, reuse and recycle water.

Consumptive water is defined as ‘water in’ which may include mains, ground and surface water. In 2016 the scope of consumptive water was adjusted to exclude re-used and recycled water and water used for other purposes such as dilution for waste water treatment purposes with a view to capturing this data separately and reporting on it in future reporting cycles.

CASE STUDY



Bega Cheese water recovery

At the Bega Cheese factory in southern New South Wales there are numerous improvements planned or underway to improve water use. One of these is the recovery

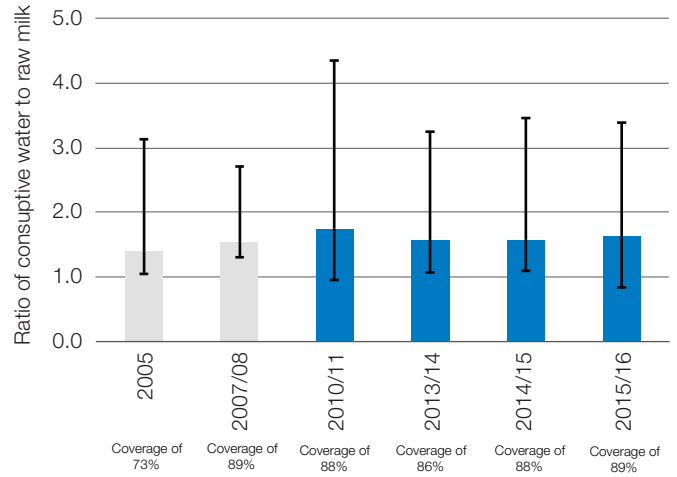
of water from the whey concentrating process for reuse in cooling towers at the Bega sites.

Approximately 125 to 150 kilolitres of water is recovered each day from cheese processing and used in five cooling towers at the factory. Permeate from the nano-filtration process goes through a reverse-osmosis membrane and is then pumped to the five cooling towers. This reduces use of bore water. In addition, steam condensate from the whey evaporating process is returned to the boiler-feed water tank, saving approximately another 70 kilolitres of bore water per day.

This project reduces both water consumption and wastewater generation.

Bega also makes wastewater available to farmers around its Bega and Strathmerton sites for irrigation. Farmers welcome the water and buy less fertiliser thanks to the beneficial nutrients and minerals it contains. In 2015/16, approximately 656ML of wastewater was used in this way, representing around 29% of the water consumed by the Bega group overall.

Figure 1 Change in water intensity



Results

In 2015–2016 DMSC members consumed an estimated 1.62 megalitres (ML) of water for every megalitre of milk processed. This figure is representative of 89% of the milk volume processed nationally. This represents an increase of 3% in the intensity of water consumption from the previous year and a decrease of 7% on the baseline year of 2010–2011. At least some of the trend in the 2015–2016 year may be due to the changes to the scope of consumptive water and differences between manufacturers in assumptions, interpretations and data management.

Target 10

Reduce greenhouse gas emissions intensity by 30%

The Australian dairy industry recognises it has an important role to play in increasing energy efficiency and reducing greenhouse gas emissions (GHG). Dairy manufacturing in Australia is responsible for around 5% of the emissions from the dairy sector overall¹. The amount of energy used and resulting greenhouse gas emissions in a dairy manufacturing plant depends on the mix of product produced. The production of milk powder, for example, requires more energy (to evaporate water) compared with liquid milk production. Product mix nationally and among manufacturers can have a profound impact on resource efficiency initiatives and the monitoring and reporting on performance.

CASE STUDY

Parmalat Wins National Award for Refrigeration Plant Upgrade

Electricity is one of the largest business costs in operating a dairy plant. Reducing these costs help manufacturers remain competitive and help to demonstrate that companies are serious about controlling energy costs and reducing greenhouse gas emissions. Parmalat, with partners Minus40, won the Energy Efficiency Council's 2016 award for Best Industrial Energy Efficiency Project for an upgrade of refrigeration plant. The project, at the Lidcombe site in New South Wales, involved variable head pressure control of ammonia compressors. By the middle of 2016, the plant was saving 2,444GJ of energy, 727 tonnes of CO₂ and an estimated \$98,000 per year. This represents 4% of the overall electricity used at the site with a simple payback time of 1.3 years.



1 environment.gov.au/system/files/resources/48f221e4-6613-4eb2-b279-18ad7061484a/files/economic-sector-2013.pdf.

2 dairyuk.org/media-area/press-releases/item/uk-dairy-industry-steps-up-its-environmental-performance

Figure 2 Change in emissions intensity

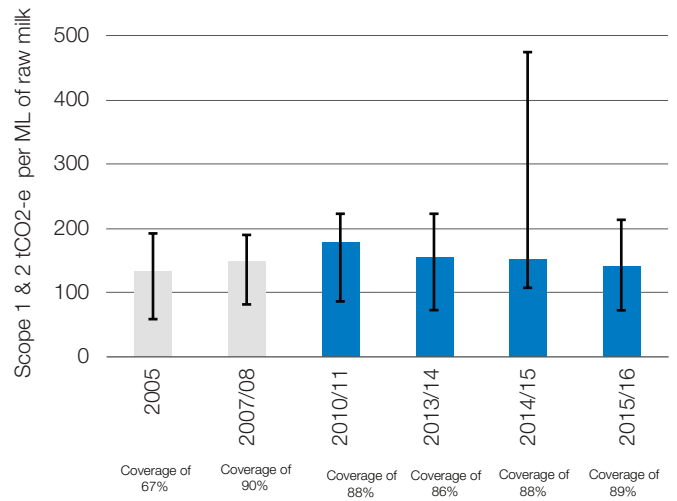
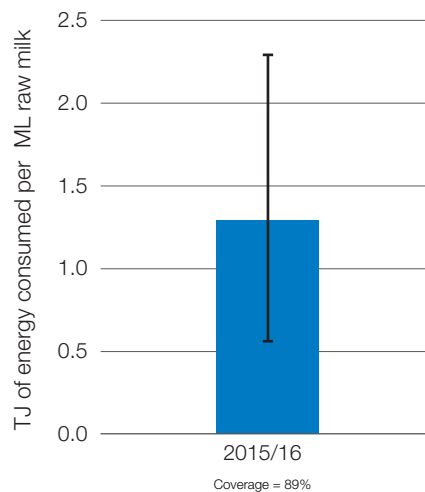


Figure 3 Energy intensity



Results

The intensity of GHG emissions generated by dairy manufacturers in 2015-2016 equated to an estimated 140 tonnes of carbon dioxide equivalent (CO₂-e) per million litres or megalitres (ML) of milk processed. This figure is representative of 89% of the milk volume processed nationally. Emissions include combusted stationary fuels (Scope 1), transport fuels (Scope 1) and emissions associated with grid electricity (Scope 2). This represents a decrease in GHG intensity of 8.2% from 2014-2015 and a 21.7% reduction since 2010-2011. Our aim is to reduce greenhouse gas emissions intensity from dairy manufacturing by 30% by 2020.

This year, we are also reporting on our energy intensity which was 1.29 TJ (terajoules) per ML of milk processed in 2016. This represents 89% of the milk volume processed nationally. Our intention is to report trend data and efficiency initiatives in future reporting cycles in a similar way to Dairy UK which reported an increase of 15% in the energy efficiency of participating manufacturers between 2008 and 2015².

Target 11 | Reduce waste to landfill by 40%

Dairy manufacturers generate a variety of waste streams, ranging from cardboard and plastic packaging to wooden pallets and waste water treatment sludges. Sending waste to landfill attracts a cost as most Australian states use levies to facilitate waste reduction efforts.

Figure 4 Change in waste intensity

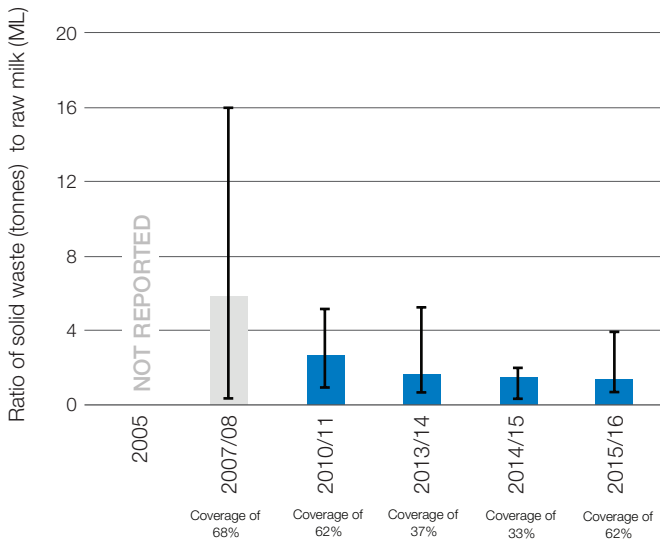
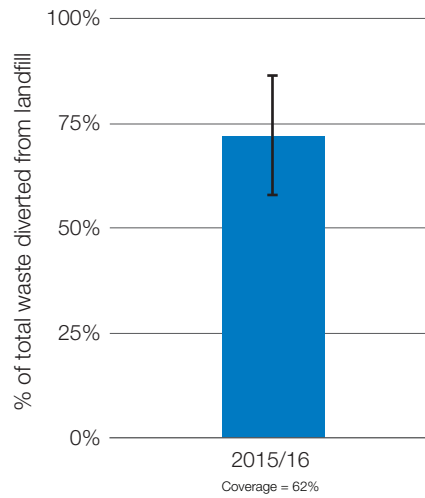


Figure 5 Waste diversion rate



Results

In 2015–2016, Australian dairy manufacturers produced an estimated 1.39 tonnes of waste to landfill per million litres or megalitre (ML) of milk processed. This figure is representative of 62% of the milk volume processed nationally. This equates to a 48.4% reduction since 2010–2011 and exceeds our target of a 40% reduction by 2020. While not directly comparable, Dairy UK’s environmental benchmarking among manufacturers achieved a 22% reduction in waste to landfill per tonne of product between 2008 and 2015.

While some of this reduction is due to increased efforts to reduce and divert waste, some improvement is also likely to be due to improved measurement of waste. Since data collection started, more companies are having contractors weigh waste more accurately, rather than estimating by volume, and this has helped to improve accuracy.

This year, we are also reporting on waste diversion and in 2015–2016 diverted 7 million tonnes of waste from landfill and a diversion rate of 72%. Manufacturers are also collecting data across a broader range of waste streams which we hope to include in future cycles using new tools and emerging standards such as the Food Loss and Waste Protocol³.

3 <http://flwprotocol.org/>

CASE STUDY



Parmalat's 'Light Weight' Project

Parmalat Australia has been a signatory to the Australian Packaging Covenant for the past 5 years and uses Sustainable Packaging Guidelines to assess new

and existing packaging as a standard company process. To date, Parmalat has made many changes to packaging ranging from reducing the thickness of plastic labels to the standardisation of plastic bottles. This project targeted improvements to both the design and efficiency in the creation of HDPE bottles for Parmalat's Ice Break and Breaka brands. Results for the 2015–2016 financial year indicate that the "Light Weight" project reduced package weights between 1.9 and 2.8 grams on average. The represents an annual saving of more than 95 tonnes of blown plastic, which is the equivalent of 3.2 million additional bottles, and saves the company approximately \$380,000 per annum by optimising existing technology. The project will be further refined to find even more savings before being implemented Australia wide. The project was also 'highly commended' by the Queensland Premier's Sustainability Awards 2016.

CASE STUDY



Bega Cheese: listening to our employees and reducing waste

During 2016, a tanker bay employee at the Tatura site identified losses to trade waste when loading permeate and

wey tankers. The employee identified that toward the completion of tanker loading, fresh water was pushed into the transfer line to clean it, but because the tanker would typically fill before the water pushed through the entire length of the transfer line, often this resulted in permeate or wey being lost to the trade waste drain. A simple solution of installing opacity meters in the transfer line now enables the operators to fill the tankers completely with product and avoids discharging a significant volume of wey or permeate to the drain. This system was installed in late September 2016, and a comparison of the total trade waste discharge of lactose between October 2015 and October 2016 has revealed that 212 tonnes of lactose was discharged in October 2015, whereas only 151 tonnes was discharged in October 2016. This represents a 29 per cent reduction – most of which is attributable to the change at the tanker bay.



New metric | Waste water

Managing waste water treatment and discharge is a significant challenge to manufacturing dairy products and is subject to significant environmental regulation. Fluid milk includes fat, protein, lactose, lactic acid and elements such as sodium, potassium, calcium and chloride. Wastewater treatment is designed to reduce organic loads and minimise environmental impacts associated with effluent.

CASE STUDY

Fonterra reducing organic loads in waste water

In 2015-2016 Fonterra Australia installed a high performance dissolved air flotation (DAF) system at its processing facility in Wynyard, Tasmania. This technology, which captures and concentrates milk solids from the site's wastewater, has reduced the organic load in the wastewater by approximately 1,200 t/year. This has further enabled the site to move from on-farm irrigation of this highly concentrated wastewater to simply disposing of it to trade waste – a solution which is better for the surrounding environment and improves the sustainability of the site's operations in future scenarios where nearby land availability may diminish.



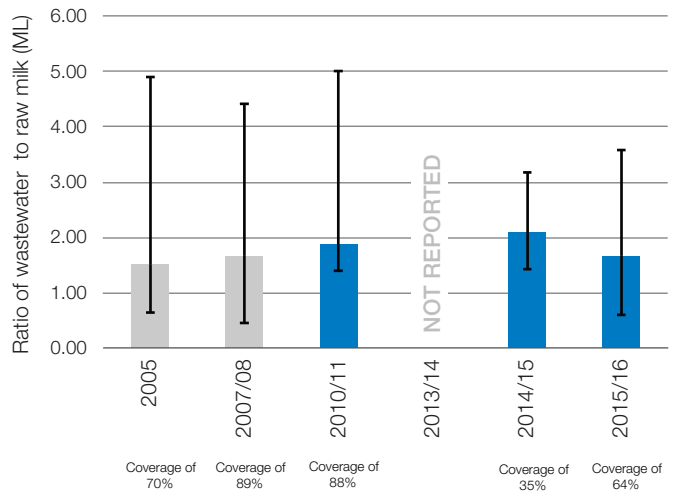
CASE STUDY

Manufacturers partnering in sodium management



Since 2012, Fonterra Australia, Devondale Murray Goulburn and Bega Cheese Limited/Tatura Milk Industries have been working together to tackle issues of salinity in northern Victoria. Through sharing site data and working together with regional water authorities as part of the Northern Victoria Saline Management Project, these DMSC members are actively seeking to improve the environmental performance of their processing sites in northern Victoria as well as develop a region-wide approach which ensures sustainable sodium management into the future. Between 2015 and 2016, Tatura Milk Industries, through a variety of process improvements measures, reduced their sodium discharge to trade waste by 21%.

Figure 6 Change in wastewater intensity



Results

Data on waste water intensity has been reported on twice by the DMSC since 2010–2011. Significant efforts have been made in recent years to improve data integrity and the coverage of the sector which is now more representative at 64% of national milk volume processed. Australian dairy manufacturers produced an estimated 1.65 ML of waste water per ML of milk processed in 2015–2016. This represents a decrease of 21.6% on last year's result of 2.11 ML of waste water per ML of milk processed. We hope to increase the coverage to include a greater share of the milk volume processed and also improve data integrity in coming reporting cycles.



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