



# Fonterra Sustainability Report 2017- Environmental Data Reporting Notes

## Introduction

This document is a supplement to our Sustainability Report 2017 published to provide additional supporting information on our reported environmental performance.

## Assurance

Independent assurance of our Sustainability Report including this appendix has been completed by Bureau Veritas. Please refer to the assurance statement in the main report.

## Organisational Boundary

The report covers the global activities of Fonterra Co-operative Group Limited and joint ventures under Fonterra's management control. On a raw milk collected and processed basis, New Zealand and Australia represent more than 95 per cent of the farming and manufacturing activities reported.

For our greenhouse gas emissions (GHG) reporting Fonterra has chosen to report on Scope 1, 2 where we have operational control and also our main Scope 3 emissions. Farms supplying milk to us account for the largest portion of our emissions and fall within our sphere of influence so we believe it is important to report these under Scope 3 emissions. Fonterra only directly operates a small number of farms in New Zealand and China. For these farms we have adopted the same approach as for other farms but allocated the emissions to Scope 1 and 2 where required.

## Reporting Period

The primary reporting period is for the 2017 Financial Year 2017 (FY17), 1 August 2016 – 31 July 2017.

Due to the elapsed time required to complete a lifecycle analysis, the reporting period for our on-farm GHG emissions is the 2015-16 milking season, 1 June 2015 – 31 May 2016.

## Key Energy and Emissions Data

### Total energy used by manufacturing

		Units
Energy used	29.4	PJ (10 <sup>15</sup> Joules)
Energy intensity per tonne of finished goods	7.55	GJ/tonne

These figures include Scope 1 (direct) energy and Scope 2 (indirect) energy used by our manufacturing sites, main research centre, large corporate sites and our own milk collection transport fleet in New Zealand and Australia. It excludes energy used by all other smaller offices and sites which are considered to be immaterial. It also excludes energy used on the farms we own and

operate because this is included in the lifecycle analysis for on-farm emissions. It is immaterial to our overall energy usage and the associated emissions are already captured our on-farm reporting.

Fuels used include coal, natural gas, diesel, liquid petroleum gas (LPG,) furnace oil, petrol and biomass.

Our co-generation facility at Te Awamutu, New Zealand generated excess electricity which was sold. The total sold during FY17 was 1,142 GJ.

We are unable to separate heating energy from cooling energy but the energy used for heat dominates our energy use.

### Global consolidated emissions

	On farm	Manufacturing and distribution	Other	Overall	
<b>Scope 1</b>	243	1,445	0	1,689	000 tCO <sub>2</sub> -e
<b>Scope 2</b>	53	630	0	683	000 tCO <sub>2</sub> -e
<b>Scope 1 and 2 sub-total</b>	297	2,075	-	2,372	000 tCO <sub>2</sub> -e
<b>Scope 1 &amp; 2 Emissions intensity</b>					
<b>by finished goods</b>	0.08	0.53		0.61	tCO <sub>2</sub> -e/t
<b>by revenue</b>	15	108	-	123	tCO <sub>2</sub> /million NZ\$
<b>Scope 3</b>	19,644	168	63	19,876	000 tCO <sub>2</sub> -e
<b>Scope 1,2,3 Total</b>	19,941	2,244	63	22,248	000 tCO <sub>2</sub> -e
<b>Scope 1,2 &amp; 3 Emissions intensity</b>					
<b>by revenue</b>	1,037	117	3	1,157	tCO <sub>2</sub> -e/million NZ\$

Our GHG emissions reporting applies the principles of the Greenhouse Gas (GHG) Protocol. We also report our GHG emissions via the Carbon Disclosure Project (CDP), with our first submission completed in 2015.

### Common principles

#### Baseline years

For our long-term energy efficiency programme in New Zealand manufacturing sites, FY03 (1 August 2002 to 31 July 2003) is our baseline year.

For other New Zealand and Australia indicators our baseline year is FY10 (1 August 2009 – 31 July 2010).

For our more recently set targets, our baseline year is FY15 (1 August 2014 – 31 July 2015), the first year where we have reasonably complete data for our global operations.

### Data collection and aggregation

Wherever possible, data is sourced from a verifiable source. For energy this is usually records from supplier invoicing. For water this is from supplier invoicing where relevant or from metering used to satisfy environmental resource permits. Data is aggregated and analysed via Excel.

### Missing or delayed data

Where measured data is normally available for a given item in a given region but it is not available for a given time period (e.g. one particular month), it is estimated based on the specific circumstances.

Where there is uncertainty about fuel sources and emissions factors, a worst case approach has been taken. For example, where a site purchases steam from a third party, generated from a mix of furnace oil, gas and biomass but the proportions of these fuels is unknown. In this report it is assumed to be generated entirely from furnace oil as this gives the highest emissions.

If the data subsequently becomes available, the estimated value will be replaced with the actual and totals recalculated. If this difference is significant, prior year data will be restated in the next public reporting period.

### Other

Where finished goods are produced by one factory and then subject to secondary processing we only count the finished goods once for intensity purposes.

## Methodologies

### On-farm

For on-farm, the estimated emissions we are reporting we use a lifecycle analysis (LCA) methodology which considers the full on-farm carbon lifecycle, from 'cradle-to-farm gate'. Fonterra commissions AgResearch to complete this analysis based on a sample of farms from each region of interest. The analysis for the most recent report, for the 2015-16 season, was completed for New Zealand (531 farms), Australia (75 farms) and China (all 7 farms). The main methodology used is common across all and conforms to IDF (2015) and LEAP (2015) guidelines.

It considers Methane (CH<sub>4</sub>), Nitrous oxide (NO<sub>2</sub>) and Carbon dioxide (CO<sub>2</sub>) arising from feed sources, animals, fertilisers, energy and land use change. For supplying farms emissions are split between the milk and meat co-products, with only the milk component being counted here. For the few farms that we manage, full emissions are allocated here.

The LCA methodology includes emissions related to all on-farm activities, including emissions related to fuel use and electricity consumption, and emissions related to supplementary feed, including emissions related to overseas production for PKE. These inclusions mean that our reported figures may be higher than figures reported in other publications that consider a New Zealand inventory only.

## Manufacturing

For New Zealand and Australia, where energy contents and emission factors are well understood and supported by local regulations and/or reporting guidelines, the local factors have been applied. Elsewhere internationally accepted default factors have been applied. For thermal energy the convention in New Zealand and Australia is to report energy totals in gross terms (higher heating value). Therefore this approach has been adopted for all countries.

The sources of the default factors were:

Energy contents: International Energy Agency (IEA) "Energy Statistics Manual"

Electricity use has been converted to energy terms at 0.0036 GJ per kWh while fuels use is converted on a gross calorific, or higher heating value, basis<sup>1</sup>.

Electricity emission factors: IEA "CO<sub>2</sub> Emissions from Fuel Combustion (2017 edition)"

The factors used were as tabulated by country for the 2015 calendar year as this was the most recent complete set. These have been applied for FY15, FY16 and FY17. Venezuela is not listed so the Non-OECD American factor has been used.

Fuels emission factors: Greenhouse Gas (GHG) tools library and specifically the spreadsheet "Emission\_Factors\_from\_Cross\_Sector\_Tools\_March\_2017.xlsx"

Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Nitrous oxide (NO<sub>2</sub>) have been considered with SAR5 GWPs.

## Scope 3

### Distribution

Data has been collected and reported for finished goods moved within New Zealand and exported from New Zealand to final destination port in the world only. This is estimated to account for more than 80 per cent of our emissions from distribution of finished goods.

### Air travel

Data has been collected and reported for all business air travel organised through our nominated travel agents.

### Other

Energy transmission and distribution losses have been included for gas and electricity purchases in New Zealand and Australia.

Our Scope 3 emissions reporting aims to account for all main items. Contributions not included are small and include items such as use of hire cars and taxis, personal travel to and from work, milk

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<sup>1</sup> Many countries report energy use in net calorific value (lower heating value) terms where the latent heat available in the water formed during combustion is excluded from the available energy. Typically the gross values are about 5% higher than net values for solid and liquid fuels and up to 10% higher for gaseous fuels.

collection and finished product transport outside of New Zealand and Australia, and emissions associated with packaging, chemicals, and non-dairy ingredients.

A definitive gap analysis has not been completed but it is estimated that the excluded items account for less than 5 per cent of Scope 3 emissions.

## Water use and discharge

### Scope

Water use and waste water discharge is reported for global manufacturing sites only.

### Quality data

Chemical oxygen demand (COD) is the most common water quality measure used by our manufacturing sites but some sites use biological oxygen demand (BOD). We have therefore chosen to report on discharge water quality using COD.

Where only BOD results are available for a given wastewater destination, we have converted the BOD results to COD using a conversion factor derived from research into typical compositions for wastewater from dairy manufacturing sites ( $COD = BOD/0.6$ ).

Water quality sampling frequency varies between sites and destination of waste water but is in line with the requirements of relevant regulations or permits. It is usually tested internally to a procedure approved by the relevant authority. Some sites do not have testing facilities and therefore use external services.

### Aggregation of global quality data

For each site outlet, the average COD result for the reporting period is calculated as the median of the test results for that outlet. To aggregate these into global results per discharge destination, a weighted average is calculated based on the volume discharged for each median COD result.

Quality data for discharge to river was unavailable for two sites in Chile. Quality data for discharge to municipal services was unavailable for four sites globally. These outlets have been excluded from the globally aggregation calculation.