Synlait

SYNLAIT MILK LTD

GREENHOUSE GAS INVENTORY REPORT – FY18

INTRODUCTION

Synlait Milk Limited (Synlait) is a young, pioneering company headquartered in Dunsandel, Canterbury, and is one of the largest milk product manufacturers in New Zealand. Synlait has around 700 staff and works with over 250 milk suppliers to create the very best in milk nutrition for their global customers. Our main product categories are infant nutrition, ingredients, everyday dairy and adult nutrition.

Synlait has recently developed a comprehensive sustainability strategy, aligned with our purpose of "Doing milk differently for a healthier world". Within this strategy, we have defined the following climate change targets:

- Off-farm: 50% reduction in CO2eq per kg of product by 2028, vs 2017-18 base year
- On-farm: 35% reduction in CO2eq per kg of milk solids by 2028, vs 2017-18 base year
    - 50% reduction in N2O per kg of milk solids by 2028, vs 2017-18 base year
    - 30% reduction in CH4 per kg of milk solids by 2028, vs 2017-18 base year
    - 30% reduction in CO2 per kg of milk solids by 2028, vs 2017-18 base year

This document is the base year Greenhouse Gas (GHG) emissions inventory report for Synlait, for the period 1 August 2017 to 31 July 2018.

STATEMENT OF INTENT

This inventory report forms part of Synlait's commitments to sustainability and environmental best practice and informs the senior management's decision-making relating to the organisation's sustainability strategy. Synlait intends to make this report publicly available through its website.

GHG INVENTORY SUMMARY FOR FY18

Table 1: GHG Emissions by scopes

	FY18 (base year) – tCO_2e
Scope 1	115,979
Scope 2	6,923
Scope 3	789,829
Total	**912,731**
Emissions intensity	1,038 per $M revenue

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Table 2: GHG Emissions by activities

Emissions sources	tCO_2e
Scope 1	
LPG	470
Coal	108,301
Diesel - Haulage trucks	5,692
Distributed Natural Gas	163
Company Car - Diesel	72
Company Car - Petrol 91	1
Packing Gas	1,266
Rental Cars	14
Scope 2	
Electricity	6,923
Scope 3	
Gas Transmission Losses	19
Electricity transmission losses	565
Waste Landfilled	421
Road freight	665
Sea freight	30,162
Air freight	443
Car mileage	4
Taxi	3
Air travel	1,814
Hotel	150
On-farm emissions	755,583
Total GHG emissions	**912,731**

Table 3: On-farm emissions - total and breakdown by GHG type

	Total-tCO_2e	CO_2- tCO_2e	CH_4 -tCO_2e	N_2O-tCO_2e
On-farm emissions*	**755,583**	119,758	442,268	193,559

*The GHG type breakdown is shown for on-farm emissions only as emissions factors for some off-farm emissions (such as electricity, rental cars, transmission losses and taxi) did not have the GHG type breakdown available, therefore could not provide the full picture.

Table 4: Emissions intensity by GHG type

Emission intensity metrics	Total-tCO_2e	CO_2- tCO_2e	CH_4 -tCO_2e	N_2O-tCO_2e
Off-farm emissions/tonne of production	**1.13**	N/A (see comment in table 3 above)		
On-farm emissions/tonne of milk solids	**11.87**	1.88	6.95	3.04

ORGANISATIONAL BOUNDARY

Organisational boundaries were set with reference to the methodology described in the GHG Protocol and ISO14064-1:2006 standards.

The following entities have been **included** in the emissions inventory:

- Synlait Milk Limited, and its three wholly-owned subsidiaries,
    - Synlait Milk Finance Limited
    - New Zealand Dairy Company Limited
    - Eight Nine Richard Pearce Drive

Synlait has the following ownership stakes which have been **excluded** from the emissions inventory:

- 25% shareholding in Sichuan New Hope Nutritionals
- 17% shareholding in Primary Collaboration New Zealand Limited

In terms of business units, Dunsandel (our main manufacturing site) and Richard Pearce Drive (our blending and canning site in Auckland) were included in the inventory. The following three business units were excluded:

- Pokeno: this site was not operational in FY18
- Talbot Forest Cheese: Synlait did not own this business unit in FY18
- Synlait Innovation Centre in Palmerston North: this business unit was established late in FY18. GHG emissions are de minimus.

OPERATIONAL BOUNDARY

Synlait has chosen to report on Scope 1 and Scope 2 emissions, as well as part of Scope 3 emissions.

Table 5: Scope 3 categories included in the inventory

Category	Comment
Category 1 – Purchased goods and services	Carbon, nitrous oxide and methane emissions from dairy farms supplying Synlait were included in the inventory. However, emissions from dairy cows when they are wintering, i.e. when they are removed from milking platforms and sent to other farms during winter, were not taken into account in the inventory.
Category 3 – Fuel and energy related activities not included in Scope 1 or Scope 2	Transmission losses linked to the purchase of electricity and natural gas were included in the inventory.
Category 4 – Upstream transportation and distribution	Sea freight also has a component of road and rail; however, we have not received this information from suppliers. The sea freight factor has therefore been applied to the full distance. Inbound sea freight data only includes Synlait's top 30 suppliers, but we have taken into account the distance to where the goods are manufactured, and not the distance to where the suppliers are located (i.e. beyond the operational boundary).
Category 5 – Waste	Waste from all operational and office sites was included.
Category 6 – Business travel	Air travel (domestic and international), taxis and reimbursed travel in private cars were included.
Category 9 – Downstream transportation and distribution	Outbound sea, road and air freight were included. However, outbound couriers were excluded from the inventory. Inter-warehouse freight, whether by road or sea, was also excluded from the inventory, but will be integrated next year.

All other Scope 3 categories have been excluded from the inventory. In particular, emissions from construction activities and emissions from employee commuting have been excluded, although we intend to include them in our future reports.

METHODOLOGIES AND UNCERTAINTIES

The inventory has been prepared in accordance with the requirement of the Greenhouse Gas Protocol: ISO 14064-1:2006 specification. Where relevant, the inventory is aligned with industry or sector best practice for emissions measurement and reporting.

An operational control consolidation approach was used to account for emissions.

Synlait used a Microsoft Excel spreadsheet to calculate GHG emissions. Table 6 below shows the emissions factors used as well as their sources.

Table 6: Emissions factors and Source

Emissions sources	Scope	Unit	$kgCO_2e$/unit	Source
Stationary Combustion				
Distributed Natural Gas	1	KWh	0.193891037	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Diesel	1	Litre	2.68	
LPG	1	Kg	3.02	
Coal - Bituminous	1		2.68	
Coal - Sub-Bituminous	1		2.00	
Coal - Lignite	1		1.43	
Coal - Default*	1		2.30	
Transport fuels where fuel data is available				
Regular Petrol	1	Litre	2.44	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Premium Petrol	1		2.43	
Petrol - Default	1		2.43	
Diesel	1		2.72	
LPG	1		1.64	
Transport fuels where no fuel data is available (mileage claims)				
Car - Small (1350-1600cc)	1	Km	0.190	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Car - Medium (1600-<2000cc)	1		0.209	
Car Large (2000-3000)	1		0.237	
Car - Default	1		0.209	
Purchased Electricity				
Purchased Electricity	2	kWh	0.119	Same as above
Transmission and distribution line losses for purchased electricity and gas				
Transmission losses Electricity	3	kWh	0.0097	Same as above
Transmission Losses Natural Gas	3		0.0229	
Taxis and Rental Cars				
Car - small (1350-1600cc)	1	Km	0.190	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Car - Medium (1600-<2000cc)	1		0.209	
Car large (2000-3000)	1		0.237	
Rental car - default	1		0.209	
Rental Car ($ spent)	1	$	0.0002358	
Taxi - distance travelled	3	Km	0.200	
Taxi travel - dollars spent (GST inclusive)	3	$	0.067	
Trains and Ferrys				
National Rail	3	pkm	0.05818	

Ferry	3		0.01928	DEFRA GHG Conversion factors, 2012
Bus	3	pkm	0.11195	
Air travel				
Domestic - Economy	3	pkm	0.26744	DEFRA GHG Conversion factors, 2017
Domestic - Premium Economy	3		0.26744	
Domestic - Business	3		0.26744	
Domestic - First	3		0.26744	
Short Haul International (<3,700km) - Economy	3		0.15845	
Short Haul International (<3,700km) - Premium Economy	3		0.23767	
Short Haul International (<3,700km) - Business	3		0.23767	
Short Haul International (<3,700km) - First	3		0.23767	
Long Haul International (>3,700) - Economy	3		0.138015	
Long Haul International (>3,700) - Premium Economy	3		0.22084	
Long Haul International (>3,700) - Business	3		0.40025	
Long Haul International (>3,700) - First	3		0.55209	
Waste to Landfill - default values (without gas recovery)				
Mixed Waste	3	kg	1.13	NZ Ministry for the Environment, Guidance for Voluntary Greenhouse Gas Reporting – 2016: Using data and methods from the 2014 calendar year
Office waste	3		1.84	
Refrigerant - Air conditioning				
R22	1	Kg	1810	Greenhouse Gas Protocol Global Warming Potential Values, AR4
R407c	1		1774	
R410a	1		2088	
CO2	1		1	
Freight				
Vans	3	Tonne/km	0.545875038	DEFRA GHG Conversion factors, 2017
Heavy Good Vehicle	3		0.10559	
Rail	3		0.03394115	
Sea freight	3		0.01605	
Air Domestic	3		5.11535	
Air Short Haul	3		1.99837	
Air Long Haul	3		1.45648	
Hotels				
Hotels - UK	3	Room per night	31.1	DEFRA GHG Conversion factors, 2017
Hotels - Australia	3		54.2	
Hotels - China	3		82.4	
Hotels - France	3		9.9	
Hotels - Germany	3		27.7	

Hotels - Indonesia	3		85.6	
Hotels - Japan	3		60.1	
Hotels - Malaysia	3		64.9	
Hotels - Saudi Arabia	3		180.8	
Hotels - Singapore	3		37.9	
Hotels - South Korea	3		83.0	
Hotels - Spain	3		45.0	
Hotels - Switzerland	3		9.3	
Hotels - Thailand	3		55.7	
Hotels - USA	3		36.4	
Hotels - Default	3		59.0	

On-farm emissions were directly obtained by OVERSEER, a software that models agricultural GHG emissions based on various parameters, such as the production of effluent, the application of nitrogen fertiliser and the supplements provided to the cows.

Emissions source inclusions

Table 7 below provides an overview of how data were collected for each GHG emissions source, the source of the data and an explanation of any uncertainties or assumptions made.

Table 7: Emissions source inclusions and source data uncertainties

Business Unit	Scope	GHG Emissions Source	Data source	Uncertainty
National Office	1	Company cars (diesel + petrol litres)	Fuel card data (Hilton Haulage)	Low uncertainty – supplier reports
	1	Air Conditioning	Active Refrigeration	Low uncertainty – supplier reports
	2	Electricity (kWh)	Genesis	Low uncertainty – supplier reports
	3	Waste to landfill (kg)	EnviroNZ	Low uncertainty – supplier reports
	3	Electricity transmission losses (kWh)	Genesis	Low uncertainty – supplier reports
	3	Car Mileage - Default (km)	Employee expense claims + general ledger account	Low uncertainty
	3	Taxi ($)		Low uncertainty
	1	Rental Cars (kms)	Orbit	Low uncertainty – supplier reports
	3	Air Travel Domestic (pkm)	Orbit	Low uncertainty – supplier reports
	3	Air Travel International (pkm)	Orbit	Low uncertainty – supplier reports
	3	Hotels (room per night)	Orbit	Low uncertainty – supplier reports
Dunsandel	1	Bottled LPG (litres)	Elgas	Low uncertainty – supplier reports
	1	Coal (kgs)	Bathurst	Low uncertainty – supplier reports

	1	Diesel - Milk Haulage (litres)	Hilton Haulage	Low uncertainty – supplier reports
	1	Company cars (diesel + petrol litres)	Fuel card data	Low uncertainty – supplier reports
	1	Packing Gas (kgs)	Air Liquide	Low uncertainty – supplier reports
	1	Air Conditioning (kgs)	Active Refrigeration	Low uncertainty – supplier reports
	2	Electricity (kWh)	Genesis	Low uncertainty – supplier reports
	3	Waste to landfill (kg)	EnviroNZ	Low uncertainty – supplier reports
	3	Freight (tonne / km)	Supplier reports	Low uncertainty – supplier reports
	3	Electricity Transmission Losses (kWh)	Genesis	Low uncertainty – supplier reports
	3	Car Mileage - Default (km)	Employee expense claims + general ledger account	Low uncertainty
	3	Taxi ($)		Low uncertainty
	1	Rental Cars (kms)	Orbit	Low uncertainty – supplier reports
	3	Air Travel Domestic (pkm)	Orbit	Low uncertainty – supplier reports
	3	Air Travel International (pkm)	Orbit	Low uncertainty – supplier reports
	3	Hotels (room per night)	Orbit	Low uncertainty – supplier reports
	3	On-farm emissions	Overseer	High uncertainty - included modelled data

Emissions source exclusions

Table 8: Emissions source exclusions

Business Unit	Scope	GHG Emissions Source	Reason for Exclusion
Dunsandel	3	Outbound couriers	To-date we have been unable to collect this data from suppliers. We intend to update our FY18 base year upon receiving this data.
	3	Inbound couriers	To-date we have been unable to collect this data from suppliers. We intend to update our FY18 base year upon receiving this data.
	3	Inbound rail freight	The sector from seaport to inland port by rail has been excluded (de minimus).
	3	Outbound rail freight	The sector from inland port to seaport by rail has been excluded (de minimus).
	3	Airfreight received	To-date we have been unable to collect this data from suppliers. We intend to update our FY18 base year upon receiving this data.

GHG information management and monitoring procedures

The calculated GHG emissions are stored in the Excel summary for the relevant inventory year. Ongoing monitoring will occur annually, and emissions compared against the base year. The emissions management reduction programmes, strategies and results will be discussed separately in Synlait's Sustainability Report.

Other emissions – HFCs, PFCs and SF6

There were no top-ups of equipment using HFCs (no release of HFCs) for this period.

Air conditioning is excluded from the inventory where offices are leased.

No operations use perfluorocarbons (PFCs) or sulphur hexafluoride (SF6), therefore there are no holdings.

Other emissions - biomass

No biomass is combusted in the operations and therefore no emissions from the combustion of biomass are included in this inventory.

Other emissions - deforestation

No deforestation has been undertaken by the organisation on land it owns and that is included in this inventory, therefore no emissions from deforestation are included in this inventory.

Pre-verified data

No pre-verified data has been included in this inventory.

VERIFICATION OF GHG INVENTORY

This report has been verified by Deloitte, a third-party independence assurance provider. A reasonable level of assurance has been given over the Scope 1 and 2 assertions and quantifications included in this report and a limited level of assurance over the Scope 3 assertions and quantifications.

Person responsible:	Hamish Reid, Director of Sustainability and Brand 	Frequency of report:	Once a year
Dated:	July 4, 2019	Base year:	2017-2018

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INDEPENDENT REASONABLE AND LIMITED ASSURANCE REPORT TO THE BOARD OF DIRECTORS OF SYNLAIT MILK LIMITED

Report on Greenhouse Gas Emissions Report

We have undertaken a reasonable assurance engagement in relation to Scope 1 and 2 emissions and a limited assurance engagement in relation to Scope 3 emissions within the Greenhouse Gas Inventory Report (the 'Inventory Report') of Synlait Milk Limited and its subsidiaries ('Synlait Milk Limited') for the year ended 31 July 2018, comprising the Emissions Inventory and the explanatory notes set out on pages 1 to 10.

The Inventory Report provides information about the greenhouse gas emissions of Synlait Milk Limited for the year ended 31 July 2018 and is based on historical information. This information is stated in accordance with the requirements of International Standard ISO 14064-1 Greenhouse gases – Part 1: *Specification with guidance at the organisation level for quantification and reporting of greenhouse gas emissions and removals* ('ISO 14064-1:2006') and the Greenhouse Gas Protocol: *A Corporate Accounting and Reporting Standard (2004)* ('the GHG Protocol').

Board of Directors' Responsibility

The Board of Directors are responsible for the preparation of the Inventory Report, in accordance with ISO 14064-1:2006 and the GHG Protocol. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation of an Inventory Report that is free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on Scope 1 and 2 emissions and a limited assurance conclusion on Scope 3 emissions in the Inventory Report based on the evidence we have obtained. We conducted our reasonable and limited assurance engagements in accordance with International Standard on Assurance Engagements (New Zealand) 3410: *Assurance Engagements on Greenhouse Gas Statements* ('ISAE (NZ) 3410'), issued by the New Zealand Auditing and Assurance Standards Board. That standard requires that we plan and perform the engagement so as to obtain reasonable assurance in respect of the Scope 1 and 2 emissions within the Inventory Report, and limited assurance in respect of the Scope 3 emissions within the Inventory Report.

Reasonable assurance for Scope 1 and 2 emissions

A reasonable assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves performing procedures to obtain evidence about the quantification of emissions and related information in the Inventory Report. The nature, timing and extent of procedures selected depend on the assurance practitioner's judgement, including the assessment of the risks of material misstatement, whether due to fraud or error, in the Inventory Report. In making those risk assessments, we considered internal control relevant to the Company's preparation of the Inventory Report. We also:

- Assessed the suitability in the circumstances of the Synlait Milk Limited's use of ISO 14064-1:2006 and the GHG Protocol as the basis for preparing the Inventory Report;
- Evaluated the appropriateness of quantification methods and reporting policies used, and the reasonableness of estimates made by the Synlait Milk Limited; and
- Evaluated the overall presentation of the Inventory Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion in respect of the Scope 1 and 2 emissions.

Limited assurance for Scope 3 emissions

A limited assurance engagement undertaken in accordance with ISAE (NZ) 3410 involves assessing the suitability in the circumstances of the Company's use of ISO 14064-1:2006 and the GHG Protocol as the basis for the preparation of the inventory report, assessing the risks of material misstatement of the inventory report whether due to fraud or error, responding to the assessed risks as necessary in the circumstances, and evaluating the overall presentation of the inventory report. A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks.

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The procedures we performed were based on our professional judgement and included enquiries, observations of processes performed, inspection of documents, analytical procedures, evaluating the appropriateness of quantification methods and reporting policies, and agreeing or reconciling with underlying records.

Given the circumstances of the engagement, in performing the procedures listed above we:

- Reviewed of adherence to the principles and requirements outlined in ISO 14064-1:2006 and the GHG Protocol, which included a consideration of completeness and balance;
- Obtained an understanding of the process of compiling and validating information received from data owners for inclusion in the Inventory Report;
- Reviewed material quantitative data, including corroborative enquiry and examined selected supporting documentation and calculations;
- Compared the Inventory Report to the reporting requirements of ISO 14064-1:2006 and the GHG Protocol; and
- Reviewed the contents of the Inventory Report against the findings of our work and, as necessary, and provided recommendations for improvement.

Inherent Limitations

Scope 1, 2 and 3 emissions

Greenhouse Gas quantification is subject to inherent uncertainty because of incomplete scientific knowledge used to determine emissions factors and the values needed to combine emissions of different gases. Additionally, non-financial data may be subject to more inherent limitations that financial data, given both its nature and the methods used for determining, calculating and sampling or estimating such data.

As the procedures performed for this engagement are not performed continuously throughout the relevant period and the procedures performed in respect of the Company's compliance with ISO 14064-1:2006 and the GHG Protocol are undertaken on a test basis, our assurance engagement cannot be relied on to detect all instances where the company may not have complied with the ISO 14064-1:2006 and the GHG Protocol. Because of these inherent limitations, it is possible that fraud, error or non-compliance may occur and not be detected.

The Company uses publicly available emissions factors in preparation of the Greenhouse Gas Inventory. We have agreed these to their source, but the scope of the engagement does not provide assurance over the emissions factors or the agricultural science used to determine the emissions factors.

Scope 3 emissions

For the Scope 3 emissions, we note that a limited assurance engagement is not designed to detect all instances of non-compliance with the ISA 14064-1:2006 and the GHG Protocol, as it generally comprises making enquires, primarily of the responsible party, and applying analytical and other review procedures.

In addition, Scope 3 emissions relating to on-farm emissions (especially fertiliser and methane production for dairy cows) are inherently uncertain due to the fact that they arise from natural processes which may vary depending on contributing factors.

Our Independence and Quality Control

We have complied with the independence and other ethical requirements of Professional and Ethical Standard 1 (Revised): *Code of Ethics for Assurance Practitioners* issued by the New Zealand Auditing and Assurance Standards Board, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Our firm is the statutory auditor of the consolidated financial statements for Synlait Milk Limited, as well as the auditor for this engagement. In addition, the firm provides tax compliance services. These services have not impaired our independence as independent auditor of the Company and Group. The firm has no other relationship with, or interest in, Company Name or any of its subsidiaries.

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The firm applies Professional and Ethical Standard 3 (Amended): *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements* issued by the New Zealand Auditing and Assurance Standards Board, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Use of Report

Our assurance report is made solely to the directors of Synlait Milk Limited in accordance with the terms of our engagement. Our work has been undertaken so that we might state to the directors those matters we have been engaged to state in this assurance report and for no other purpose. Our report is provided solely for your exclusive use and solely for the purpose outlined above. Our report is not to be used for any other purpose, recited or referred to in any document, copied or made available (in whole or in part) to any other person without our prior written express consent. We accept or assume no duty, responsibility or liability to any other party in connection with the report or this engagement, including without limitation, liability for negligence in relation to the opinion expressed in this report.

Reasonable Assurance Opinion for Scope 1 and 2 Emissions

In our opinion, the Scope 1 and 2 emissions of Synlait Milk Limited within the Inventory Report for the year ended 31 July 2018 have been prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2006 and the GHG Protocol.

Limited Assurance Conclusion for Scope 3 Emissions

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that Synlait Milk Limited's Scope 3 emissions within the Inventory Report for the year ended 31 July 2018 are not prepared, in all material respects, in accordance with the requirements of ISO 14064-1:2006 and the GHG Protocol.

Deloitte Limited

Auckland, New Zealand
4 July 2019