Overview of Fonterra's Decarbonisation Journey

15,806 kt

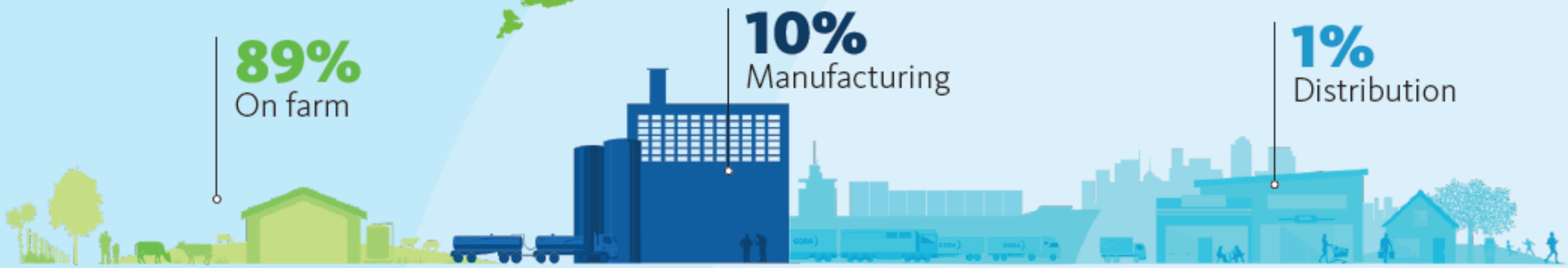
Fonterra's total gross New Zealand greenhouse gas emissions for FY18.

Fonterra represents approximately **20%** of New Zealand's gross greenhouse gas emissions.

New Zealand's dairy sector is one of the most carbon efficient in the world, **30–50%** more efficient than the global average.

WE KNOW WE MUST DO MORE

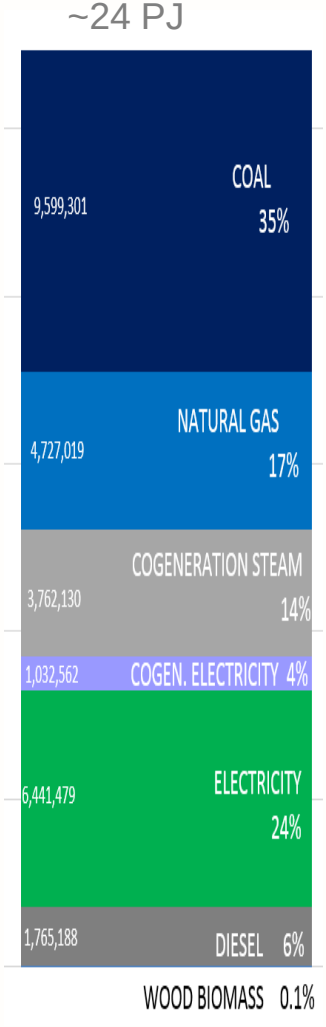
WHERE OUR EMISSIONS COME FROM:



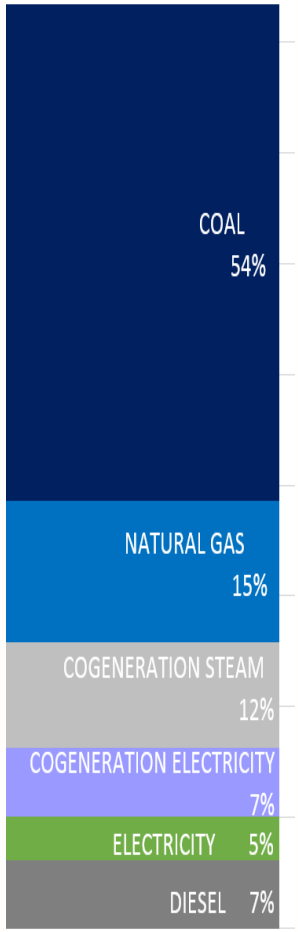
Overview of Fonterra's NZ Energy Supply & Emissions

(includes supply chain and milk collection)

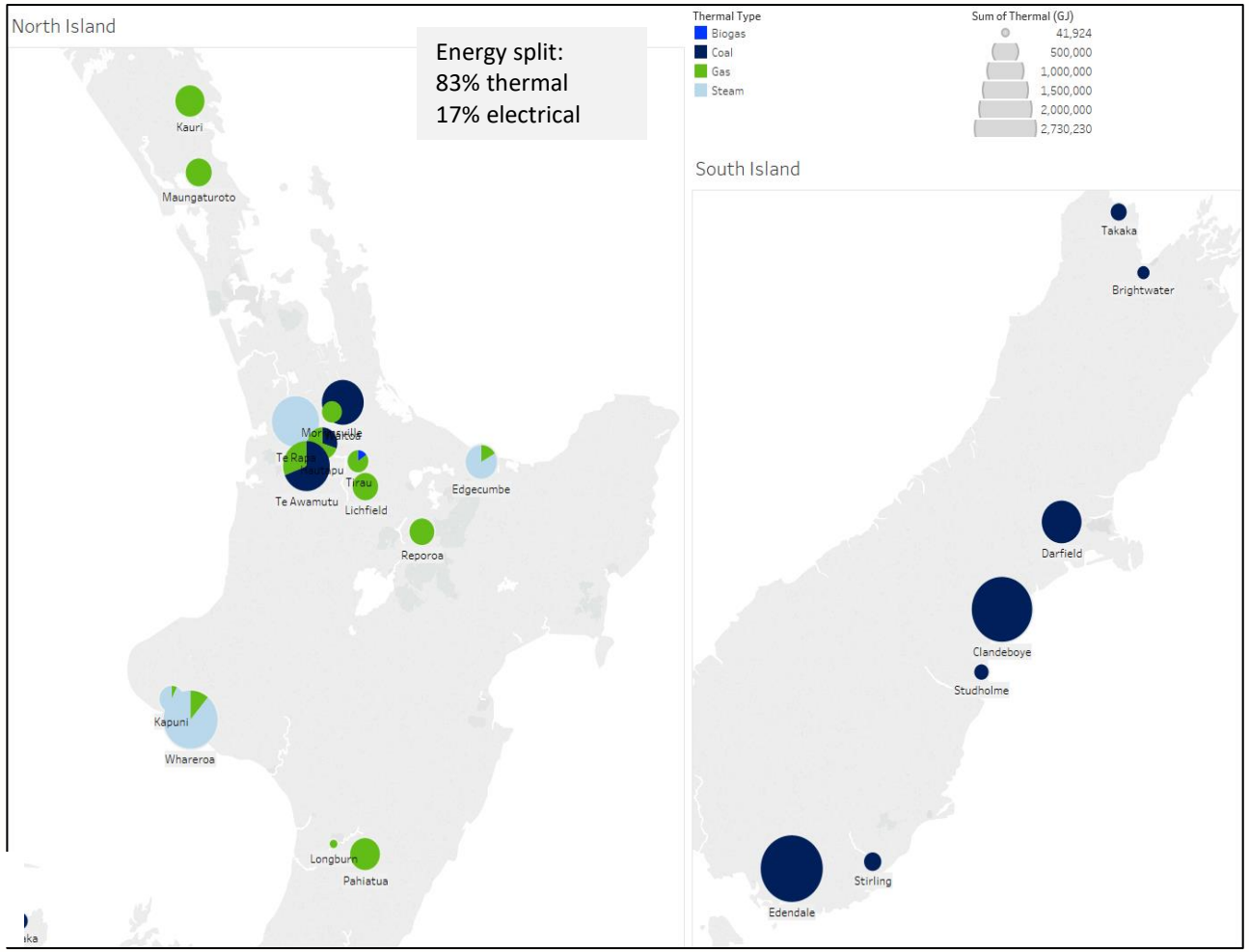
FY20 energy use
~24 PJ



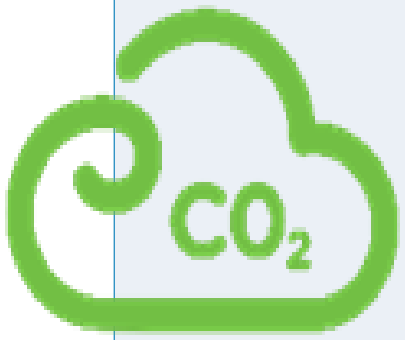
FY20 Emissions
~1.7m tonnes CO_{2e}



Source and size of thermal energy supply for NZ manufacturing sites

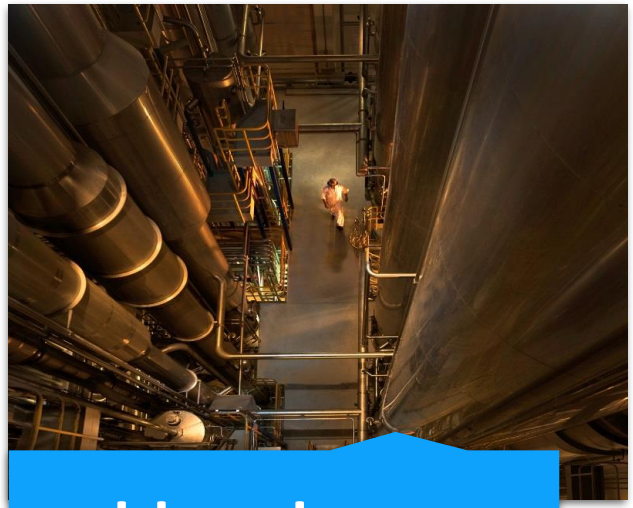


Fonterra's Decarbonisation Commitments



- **30%** reduction in absolute emissions by **2030** (FY18 baseline)
- No new coal boilers to be installed
- Prioritise the phase out of coal use by **2037**
- **Net Zero** emissions by **2050,** on the way to using **100% renewable energy**

Overview of our 30% by 2030 Emission Reduction Plan

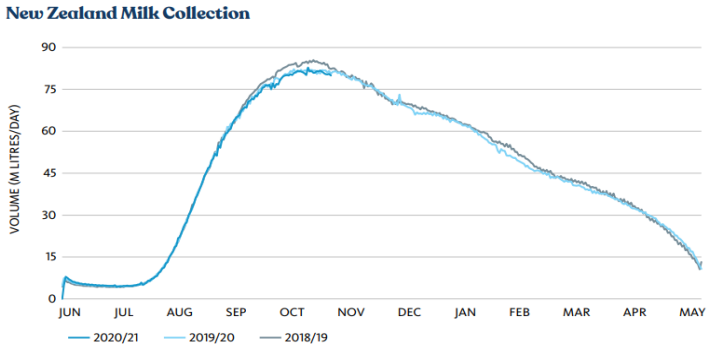


Use Less

Emit Less

Key Considerations:

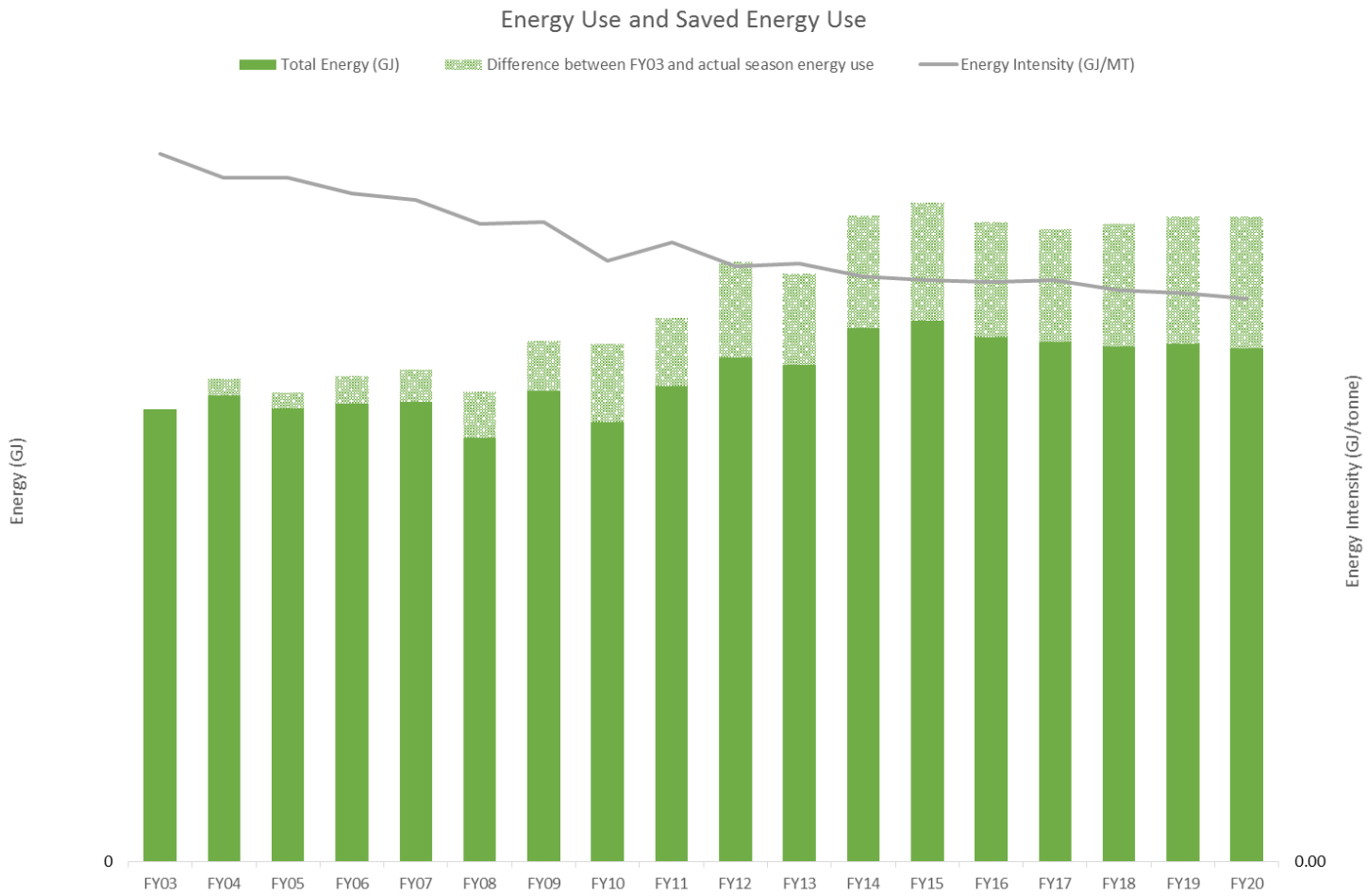
- The ability to process all of our farmer's milk;
- Ensuring the business remains economically viable in a globally competitive market;
- Long term security of supply of alternative energy sources;
- The impact of ongoing operational costs of using alternative energy sources; and
- Sustainability considerations.



Energy Efficiency activities will continue to be an important element of our decarbonisation plans.

Energy intensity is the amount of energy used per tonne of product manufactured (GJ/tonne).

- During this program in FY20 since FY03, production tonnage had increased by 42.5%, total energy use had increased by 13.3%, and total emissions had increased by 11.8%.
- FY03, Fonterra cumulatively saved enough energy (~63PJ) to power all the households in NZ for 1.5 years.
- Since FY03, Fonterra cumulatively reduced emissions by (~3.3 million tonnes) – this is the same as taking ~1,286,000 cars off NZ roads.
- Energy efficiency activities typically achieve the energy trilemma, and will assist with achieving the 2030 emission reduction target – however they will not be sufficient to achieve the target alone, fuel switching is also required.



Brightwater site co-fires on wood chip

- The Brightwater milk processing plant boiler has been converted to co-fire on coal and wood biomass, generating steam for process heat.
- Converting the boiler to co-fire on coal and wood biomass cuts site carbon emissions by an estimated 2,400 tonnes a year – the equivalent of taking 530 cars permanently off the road.

Fonterra
Dairy for life

At Te Awamutu, we're taking another step forward with our commitment to renewable energy. The site will be moving away from coal to wood pellets.

Reducing

When the full conversion is complete it will reduce carbon emissions by around **84,000 tonnes** of CO2 per year. That's equivalent to taking **32,000** cars off the road.

Reduction Goal

This conversion equates to a **75%** carbon emission reduction at site and will contribute to **16%** of Fonterra's 2030 carbon reduction goal.

Reducing

It will reduce our coal usage in New Zealand by **10%**. At Te Awamutu we burnt **42,000 tonnes** of coal last season and we expect to burn **50,000 tonnes** of wood pellets once we have shifted away from coal.

Partnership

We know we can't do it alone, that's why our partnership with Nature's Flame our **sustainable wood pellet** supplier is so important.

Sustainable

Nature's Flame wood pellets are truly renewable and sustainable, made from wood waste, shavings, sawdust and off-cuts. They also use **renewable geothermal energy** to make these wood pellets.

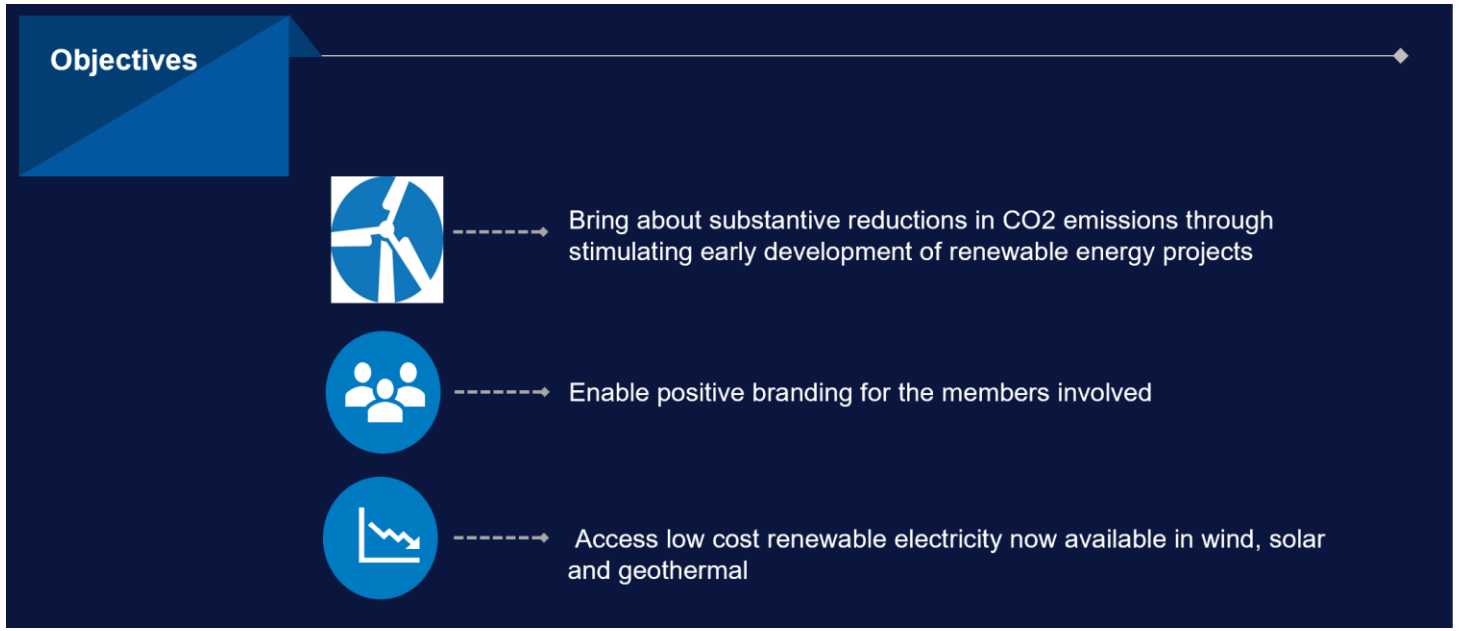
We have learnt a lot about process heat electrification and fuel switching to electricity – its not as easy as flicking a switch!

Heat Pumps

Converting TVR Evaporators to MVR

Electrode Boilers

Renewable Electricity Generation Project

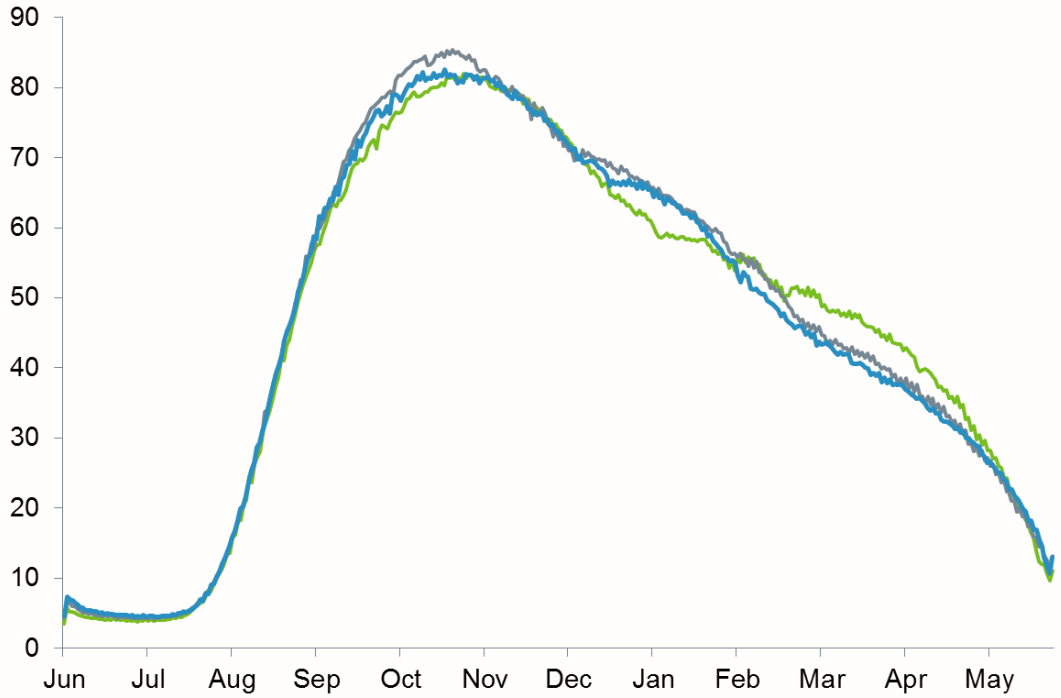


- Fonterra partnered with other major electricity user group (MEUG) members (Refining NZ, NZ Steel, PanPac Forest Products, Oji Fibre Solutions, Ballance) to undertake an RFP to purchase electricity from new renewable electricity generation projects
- 19 responses were received and assessed on range of criteria, including reduction in CO2 emissions, positive environmental branding, stimulated development of consented renewable electricity generation, long term price certainty, and cost.
- The project shows there are benefits for Fonterra to pursue this to secure fixed prices for a portion of our load via these new generators.

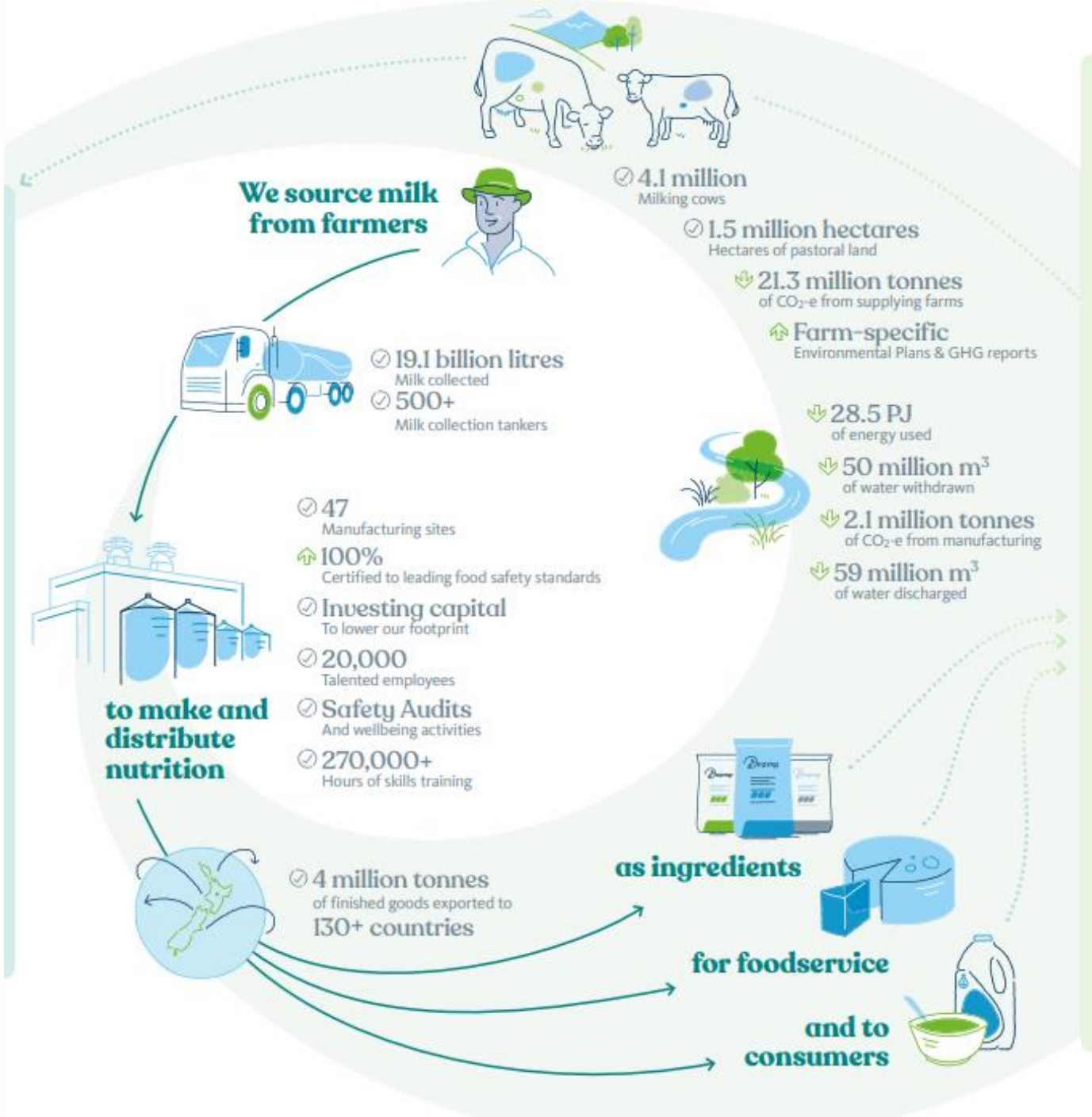

Thank you
Questions?

Fonterra Overview

Volume (m litres/day)



Season	Total Milk Solids (kgMS)	Peak Day Milk
2017/18	1,505m (down 1%)	82m litres
2018/19	1,523m (up 1%)	85m litres
2019/20	1,517m (down 0.4%)	83m litres



Our Climate Journey

2003

Set 2020 target to improve energy intensity by 20%

2013

Fonterra signs partnership with the **Department of Conservation**

2015

ISO 26000 social responsibility framework introduced

2016

First CDP report released

2017

Commitment to **net zero** by 2050 & to a 30% reduction in GHG's by 2030

2017

First Farm Environmental Plans created for farmers

2018

Founding member of the **NZ Climate Leaders Coalition**

2018

Brightwater site burns wood biomass reducing CO2 emissions

2021

First **carbonzero butter** in NZ launched

2020

First **carbonzero milk** for NZ launched - 'Simply Milk'

2020

On-farm reports provided to all farmers on their specific biological GHG emissions

2020

Te Awamutu site converted from coal to renewable energy using **wood-pellet biomass**

2020

Achieved target of **20% energy intensity** improvement

2020

Launched trial with seaweed and developing Kowbucha to help reduce methane

2018

Commitment to no new **coal boilers**

Our Future

2021

Co-operative Difference Payment of an extra 10c per kg of milk solid to those meeting on-farm sustainability & value targets

2021

Undertake a climate risk analysis using the TCFD framework

2025

Every Fonterra farmer has a FEP

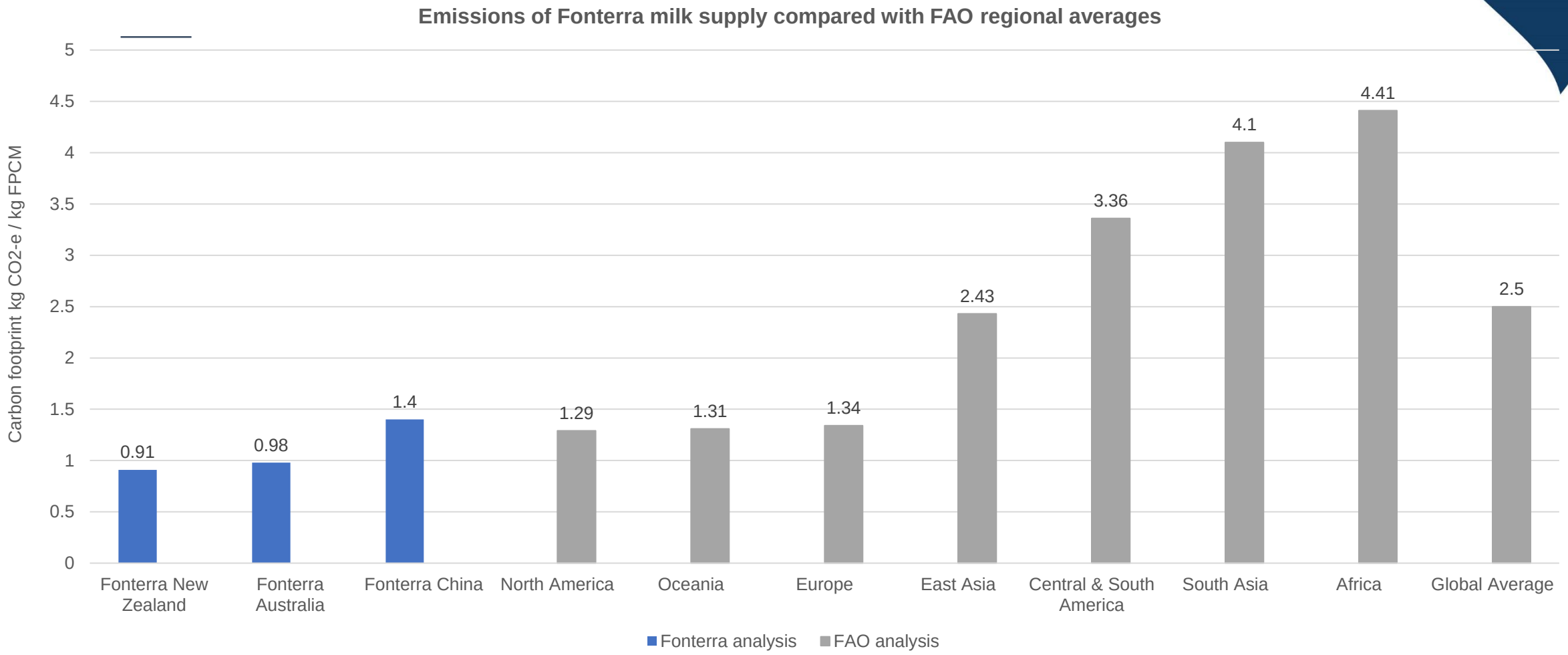
2030

Reduce absolute manufacturing emissions by 30%

2050

Net zero emissions

New Zealand dairy's on-farm carbon footprint is one-third of the global average



SOURCE:
Fonterra New Zealand Figures from Ledgard, S.F. et al. 2020. Temporal, spatial, and management variability in the carbon footprint of New Zealand milk. Journal of Dairy Science Vol 3 Issue 1: 1031-1046.
Regional Footprint Information provided on a regional basis using FAO 2018. FAO and GDP. 2018. Climate change and the global dairy cattle sector – The role of the dairy sector in a low-carbon future. http://www.fao.org/3/CA2929EN/ca2929en.pdf .

What makes New Zealand on-farm dairy emissions so efficient?

Pasture-based farming system

Long sunshine hours

Plentiful rainfall

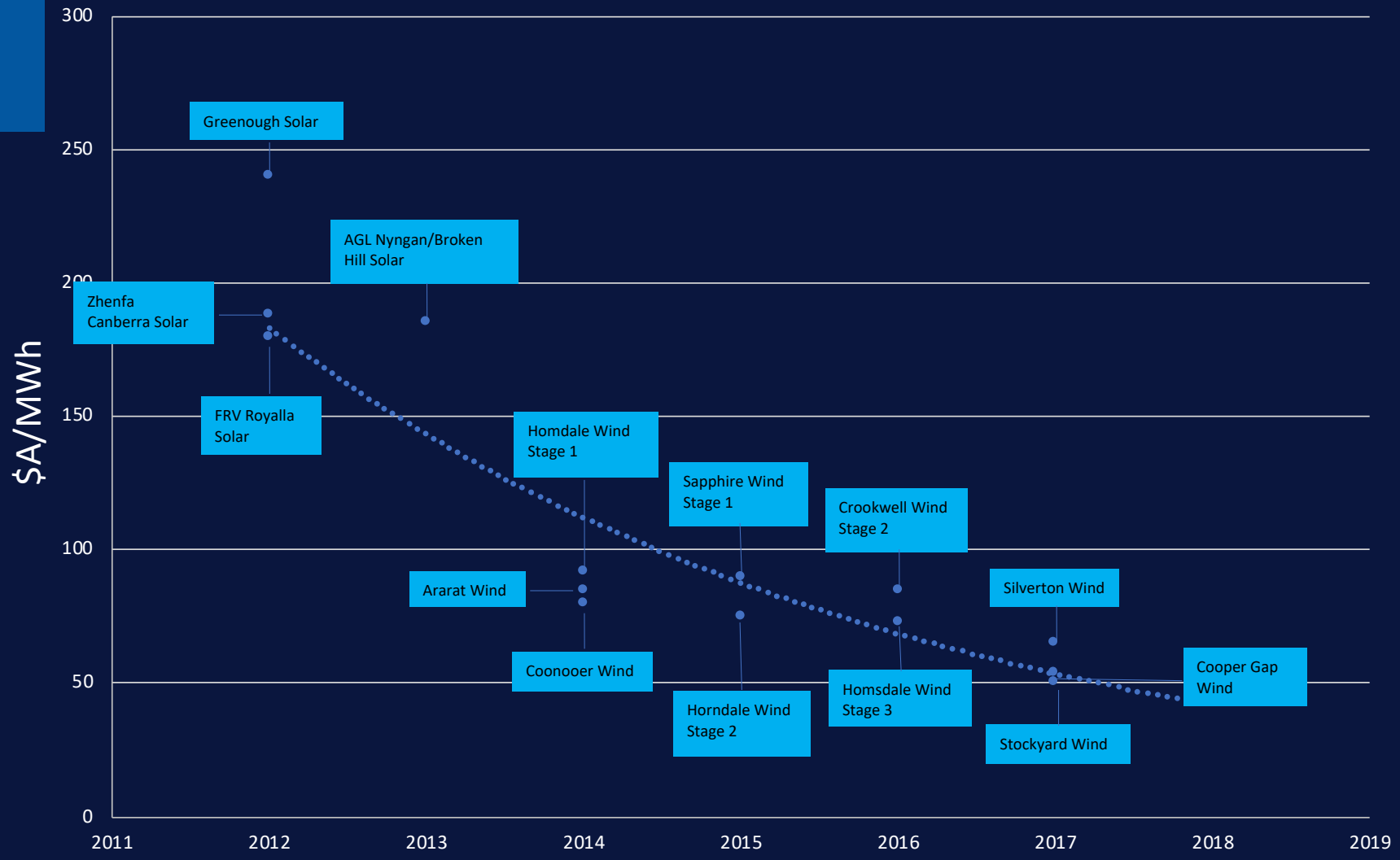
Good grass and soil

Animal health and welfare

Renewable energy

Australian Electricity Market

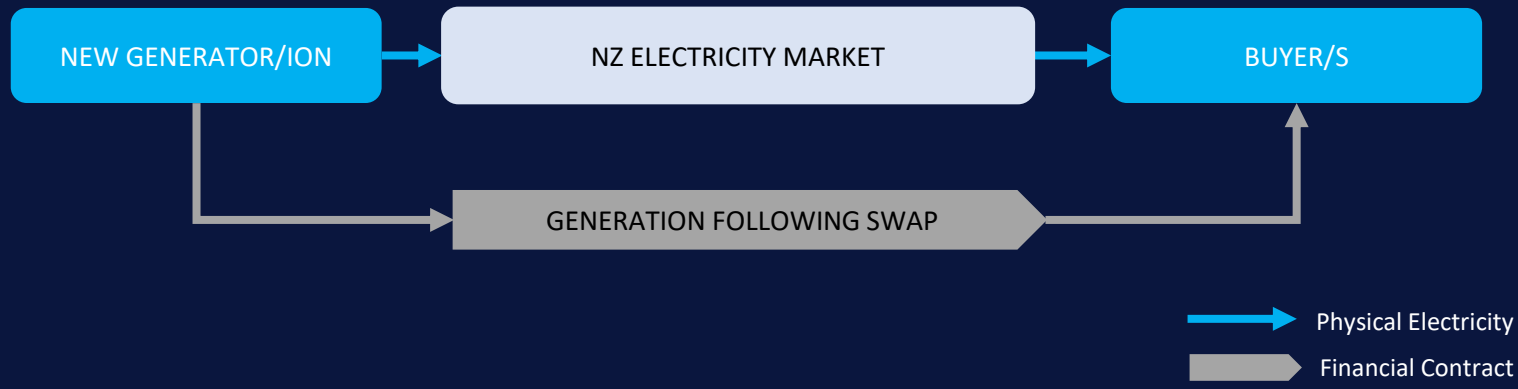
New entrant pricing



Contractual Structure

Proposed

Virtual PPA



- In essence a Contract for Differences
- Modified to reflect the physical nature of the generation project

Legal Structure

Single Identical contract

- Contracts should be simple and identical……differing only volume
- Buyers pro-rata exposed
- Volume offsets between buying Members would be leveraged by the generating Sellers
- Generating Sellers having access to the prudential abilities of buying Members balance sheets would aid bankability of their projects
- Buyers would be severally but not jointly liable