# ROAD MAP TO TRANSITION TO A LOW EMISSION FUTURE

*A Fonterra and Ministry for the Environment initiative, with support from the Ministry of Business, Innovation, & Employment, Energy Efficiency & Conservation Authority, and Transpower, to help build the foundations towards meeting Fonterra's long-term emission reduction targets.*

## Vision

**New Zealand's large industrial users of fossil fuel for thermal energy, such as Fonterra, are able to transition to a low emission, 100% renewable energy future in a cost effective manner.**
**This results in generating value for all New Zealanders and contributes to New Zealand meeting its 2030 climate change target to reduce greenhouse gas emissions by 30 percent below 2005 levels by 2030.**

## Outputs

Identify areas where Government can **collaborate** with industry to assist with greater emission reduction

**Identifies actions** to reduce emissions, improve energy efficiency, and reduce costs.

**Creates action** that builds the foundation for large energy users, such as Fonterra, to transition off coal and onto renewable sources of energy.

Show **leadership** in climate mitigation and sustainability action. Fonterra demonstrates what action could be taken by industrial users to reduce emissions.

Build **resilience** against rising energy and carbon costs

Create **value** for all New Zealanders by transitioning to a low emission future

## Enablers / Activities / Timeline

| Building the Foundation | Steps to a lower emission future | Driving industry action |
|---|---|---|
| Now - December 2017 | 2018-2019 | Post-2019 |

### Case Study: Social good benefits of electrifying process heat

To undertake an assessment and produce a report by December 2017 that summarises the public good benefits associated with electrification of processing heat. This will be used to assist the Government with considering wider benefits than GHG abatement when considering regulations & work programs. (Publically available).

### Review barriers for the uptake of renewable energy for process heat users

Barriers faced by process heat users to increase their use of renewable energy or improve the efficiency of their plant will be assessed under the Process Heat in New Zealand (PHINZ) action plan. This will help build the evidence base and identify the role of Government and potential target areas by December 2019.

### Demonstration site for wood biomass co-firing at scale

To convert a Fonterra site to enable co-firing of wood biomass with coal.

This work stream includes Fonterra developing a co-firing strategy for existing coal boiler assets and a position on future new coal boilers.

### Roadmaps for energy efficiency and large scale electrification of dairy processing

1. Identify a range of optimised energy efficient solutions for existing dairy plant processes and capture this in a roadmap to improve energy efficiency.
2. Assess the technical and economic feasibility of large scale dairy electrification by December 2017. This report is to assess and summarise how large scale electrification of dairy processing could occur.

### Explore new sources of capital and alternative financing models

Explore opportunities for new sources of capital and alternative financing models, to support investment in projects that help accelerate the transition to a low emission economy.

### Demonstration site for large scale electrification

To undertake electrification of processing improvements at a Fonterra site and to install NZ's first boiler that operates on electricity to generate thermal energy at a Fonterra site.

## Problem Definition / Opportunity

Identifying the social good benefits associated with electrifying process heat could prompt Government and industry to consider benefits beyond GHG abatement when considering regulations and investment decisions.

Engaging with large energy users in transitioning to a low emission future may generate wider benefits beyond GHG abatement, including:

Assist in establishing a market & supply chain for bioenergy; Demonstrations could verify technology for other users who cannot afford to take a risk; If Fonterra can reduce emissions in a cost-effective manner; it could help convince other large energy users to reduce emissions.

Renewable electricity is a future thermal energy source and possible alternative energy source to existing emissions intensive sources. However, it is an expensive option compared with current alternatives.

It is envisaged that large scale electrification of dairy processing will assist with lowering total energy use (therefore improving energy intensity), as well as reducing emissions from dairy processing (due to lower energy use, and use of electricity which is a predominantly renewable in NZ).

To leverage NZ's renewable advantage, it is proposed that Government review the barriers faced by process heat users to increase their use of renewable energy or improve the efficiency of their plant. This report would summarise these barriers and form part of an evidence base for any recommendations as part of the industrial heat plan, Process Heat in New Zealand (PHINZ).

This would provide industry with greater certainty of costs and timeframes when considering renewable process heat investments.

The upfront and fuel costs of transitioning from current fossil fuel energy sources to low emission alternatives such as biomass and electricity are a significant barrier to any large-scale transition.

Identifying alternative investment approaches will assist large fossil fuel users' transition to low emission energy sources. It will help bridge the gap between fossil fuel energy sources and existing renewable solutions to deliver a low emission energy future in time.

Fonterra, like other industrial users, has a significant installed base of coal boilers that typically have a lifespan of 40+ years. It is unlikely that all boilers will be replaced in the short-medium term as some have recently been installed.

Therefore it is important for companies to develop a strategy to minimise emissions from these boilers while they remain using coal to ensure these assets do not become stranded & maximises their use while they remain operational.