Submission

He Tūāpapa ki te Ora - Infrastructure for a Better Future

Introduction

We welcome the opportunity to provide our thoughts on *He Tūāpapa ki te Ora - Infrastructure for a Better Future.*

Fonterra supports the development of an Infrastructure Strategy for Aotearoa New Zealand and the outcomes and decision-making principles identified in the consultation document. As a co-operative owned by 10,000 New Zealand farming families we are deeply invested in New Zealand's future.

We support the Commission's analysis that a combination of a growing population, climate change and years of underinvestment have given rise to a large and growing infrastructure challenge. A well-designed, long-term infrastructure strategy presents a significant opportunity to reimagine New Zealand's infrastructure networks and deliver assets that will realise significant social and economic value for New Zealanders in the years leading to 2050 and beyond. A carefully considered and implemented Strategy could substantially improve the well-being and productivity of New Zealanders including by reducing the amount of time we spend in our vehicles stuck in traffic; ensuring the reliability of our energy so businesses can plan with some certainty; and making substantial progress towards achieving a zero-carbon economy.

From the Co-operative's perspective, a well-designed national Infrastructure Strategy will be important to ensure we operate efficiently and sustainably. Reliable and secure energy infrastructure enables us to sustainably process milk into products; well-designed rail, road and port infrastructure will enable us to efficiently move finished products from our manufacturing sites to consumers across the globe; and ensuring the right recovery and recycling infrastructure is built in the right place will be a key element in maximising opportunities for materials recovery and recycling while reducing waste being sent to landfills.

We have 27 manufacturing sites across New Zealand and have a national asset network of 21 coal boilers, and 76 gas boilers and air heaters installed in these sites. Fonterra has committed to ending our use of coal by 2037, on the way to net zero emissions by 2050, but to achieve this, we will need a reliable network of energy infrastructure. An Infrastructure Strategy should provide for industrial users to transition off coal in an autonomous and efficient manner, recognising the importance of a reliable natural gas supply during this transition. A Strategy could also consider the potential decarbonisation benefits of regional biogas systems and of providing infrastructure for the electrification of trucking.

Switching freight movements from road to rail offers a significant opportunity to reduce emissions associated with freight transport. We consider that a long-term national freight supply chain strategy, as proposed in the consultation document, could help increase rail's share of freight movements including by fostering greater coordination between KiwiRail and its customers. In particular, a supply chain strategy could consider alternative governance structures for KiwiRail that would allow it to focus on a core mission of providing a cost-competitive, lower-carbon service to citizens and industry. Shifting more freight to rail would not only reduce emissions, it would also reduce wear and tear on roads while improving the safety of roads for all users.

If there is any further information about our business that would assist the Commission as it develops the Strategy we would welcome the engagement.

Waste minimisation and recycling

- **Fonterra supports the idea expressed in the consultation document that well designed and located infrastructure can help reduce carbon emissions and increase material recovery from the waste stream**

The right infrastructure in the right place is critical to unlocking greater materials recovery from the waste stream, and to reducing carbon emissions associated with waste in New Zealand. At present, there is not enough infrastructure for materials recovery for solid waste and packaging materials to enable the circular economy and minimise climate change impacts from these materials. As New Zealand seeks to reduce waste sent to landfill in the coming years, we will need significantly more infrastructure to sort and process this waste. The country will also need increased electricity generation capacity to power increased use of energy-intensive materials processing facilities.

With respect to packaging materials, the success of the waste value chain requires more than just infrastructure, it also requires value creation for the end stream – the material that results from the recycling or recovery process. This requires creating demand for high quality recovered materials. Key considerations include type of material recovered, its location, its quality (i.e., whether it is contaminated with other materials), its safety (i.e., whether it is contaminated with non-intentionally added hazardous substances) and the volume of the waste stream (what quantity of material can be recovered reliably and regularly).

A New Zealand Infrastructure Strategy should ensure New Zealand has sufficient available infrastructure for recycling all priority plastics and other packaging materials at increased rates per year once stewardship plans are in place. Important considerations include:

- New Zealand will require decontamination infrastructure for rigid HDPE (high density polyethylene) and PP (polypropylene) if the recycled material is to be used for food packaging;
- Paper recycling capacity in New Zealand is already at capacity so new sites will be required. Paper volume is expected to grow in volume as the mix of material shifts away from plastics;
- It is likely that mixed material streams will form a part of future waste management and will require specialist recovery infrastructure.

A New Zealand Infrastructure Strategy should also consider the location of material recovery facilities to populations (infeed) and manufacturing sites (outfeed). Infrastructure sited in suitable geographic locations will reduce disposal to landfill of recoverable materials. For instance, South Island infrastructure is required to minimise carbon emissions and to create waste value streams for recovery – at present, paper and cardboard cannot be recovered in the South Island due to prohibitive transport costs to transport material to paper mills in the North Island, as well as the relatively low material recovery value. In this sense, reverse logistics (adding value back into the waste chain) is as important a part of the supply chain as input location.

In-country recovery will be essential for some waste streams but not for others and in some cases, Trans-Tasman or global circular initiatives could be effective in minimising New Zealand's waste streams. For example, flexible plastic waste streams may be best recovered through chemical recycling in Australia where a repolymerisation plant is located.

To maximise the efficiency of materials recovery and recycling, it will be important for the New Zealand Infrastructure Strategy to consider a number of factors. These include:

- The potential of emerging packaging waste recovery technologies which can improve material quality and safety and increase the value of the end material;
- New Zealand's model of decentralised, competitive collection schemes for recyclable materials has had some unintended outcomes. Most significantly, transportation costs for recovered materials sometimes exceed the sale price a materials recovery facility (MRF) can achieve for selling that material, which leads to recyclable material being dumped. One possible mechanism for managing this issue could be setting a minimum price for recovered materials to provide certainty for MRFs and to allow transportation from more remote areas of New Zealand;
- Careful design, funding, management, governance and evaluation of materials stewardship and associated recycling schemes will be necessary to ensure efficient and effective schemes;

- Options for maximising the safety and quality of material recovered through improved collection and sorting, including:
    - Standardising kerbside collections nationally to improve the consistency of materials recovered and to reduce consumer confusion;
    - Minimising confusion or unhelpful competition between kerbside collections and any new Container Return Scheme the Government may implement;
    - Extending recycling collection to rural areas through specialized programmes that need not necessarily compete with other schemes on cost; and
    - Building cleaning facilities to decontaminate material and enable further material recovery.

Efforts to recover and process organic material also suffer from many of the limitations outlined above. If a viable biomethane network is to be established in New Zealand (as recommended in the Climate Change Commission's Final Advice; see biogas section below), most organics will need to be diverted from landfill and instead be processed in purpose-built anaerobic biodigesters to produce biomethane. This biomethane could replace natural gas and reticulated LPG. If organic material is not sent to biodigesters, it should instead be sent to commercial composting facilities, though we note that commercial composting capacity is limited in New Zealand, with facilities particularly needed in the South Island, where none currently exist. Organic material in the waste stream that is not diverted either to biomethane production or commercial composting will instead directly contribute to higher methane emissions from New Zealand landfills.

Fonterra is actively reducing the quantities of materials we use and decreasing the amount of solid waste we send to landfill from all our operational sites. We are also transitioning our finished goods into packaging that is more readily recyclable. We look forward to working with the Commission to help design a national network of waste management and recycling infrastructure that accelerates our progress in these areas, and allows other organisations and the country as a whole to rapidly reduce waste and move towards a more circular economy.

Energy infrastructure

- **Fonterra supports an Infrastructure Strategy that acknowledges the importance of a range of energy sources as New Zealand transitions away from coal**

We are New Zealand's largest exporter and have 27 manufacturing sites spread across New Zealand, in addition to science and innovation centres and distribution facilities which are integral to the business. Each factory is unique in terms of the volume of milk it processes, the products it makes, the energy sources available; and the age of its assets. Nine of our sites rely on coal as their primary source of energy, including one which co-fires with wood biomass. Seven of these sites are in the South Island where there is no reticulated natural gas available.

We acknowledge we are a significant contributor to New Zealand's industrial process heat emissions. These emissions come from our national asset network of 21 coal boilers and air heaters, and 76 gas boilers and air heaters installed across our manufacturing sites. These assets have an average age of 28 years, ranging in size from 1MW to 56MW, with a total installed capacity of ~1,300MW.

We have committed to ending our use of coal by 2037, on the way to net zero emissions by 2050. For many years we have been working to lower the emissions produced at our 27 manufacturing sites by transitioning to renewable energy. Last year we achieved our target of a 20 per cent reduction in our energy intensity which is the energy used per tonne of product made, using 2003 as the baseline year. This program has focused on improving operational practices in key energy use areas, as well as significant capital investments to make further reductions in energy use, while also building new and more efficient plants. We have also begun transitioning off coal to renewable energy sources such as co-firing wood biomass at our Brightwater site and switching to wood pellets at our Te Awamutu site. Our decarbonisation plan outlines our commitment to transition our manufacturing operations off coal by 2037, so we can then focus on transitioning off natural gas from 2037 onwards.

We strongly recommend that a national Infrastructure Strategy acknowledges the interdependency of coal and gas, and the impact that the scarcity of gas could have on the dependence on coal for security of supply. As acknowledged in the Climate Change Commission's Final Advice, removing natural gas from New Zealand's energy mix too quickly could have significant consequences for electricity generation and

process heat applications and the phasing down of natural gas should be carefully managed and sequenced to minimise disruption.

As we have outlined in recent submissions to Government, including in our response to the Climate Change Commission's draft recommendations, we believe an appropriate fuel source for decarbonising our industrial process heat in line with the Commission's pathway is wood biomass, in combination with continuing to improve our energy efficiency.

Maximising the use of electricity for transitioning manufacturing sites

We have undertaken several studies across multiple manufacturing sites and have learnt a significant amount about what is required to transition a site to use a greater amount of electricity, instead of fossil fuels. In 2017 we undertook an electrification feasibility study in partnership with the Ministry for the Environment at our Edendale site in Southland. We then took these findings and applied them to our Stirling site in South Otago as the potential demonstration site for electrification. We have also applied this approach to several other sites.

During our studies into process heat electrification, we have assessed the integration of heat pumps in applications under 100 degrees; converting our thermal vapour recompression (TVR) evaporators to mechanical vapour recompression (MVR) evaporators; and fuel switching to use electrode boilers.

Following these studies, Fonterra does not have any plans to switch any of our boilers to electricity. This is because although the emissions associated with electrification are low, the operational and capital cost when compared to other fuel sources is very high.

Capital considerations aside, our ability to electrify these sites is also severely constrained by the Transpower electrical line supply upgrades that would be required to increase the capacity for electricity supply into the sites to enable electrification.

Key findings from our electrification feasibility studies:

- When we looked at the six key considerations that must be met when switching fuel source at a site, installing an electrode boiler at our Stirling manufacturing site did not meet all of these considerations, whereas a wood biomass boiler did;
- If we were to install an electrode boiler at our sites, it would take several years for additional electrical lines supply capacity to be available to most of our sites to meet the proposed increase in electricity demand at the site;
- An electrode boiler at any manufacturing site also requires a significant increase in operating cost because of the higher cost for electricity. This energy cost increase was estimated to be around a 225 per cent cost increase compared to coal;
- We have identified similar internal and external capital cost challenges, as well as the operational cost increase, when we have assessed fuel switching to electricity at a range of other sites;
- It is easier and more cost effective to incorporate electrification elements into new builds, rather than retrofitting existing systems if hot water system infrastructure is not present.

There will undoubtedly be opportunities in some locations and under some scenarios for electrification of some elements of our operations. However, the conversion of an entire manufacturing site to electricity for process heat generation is unlikely to be feasible. Greater electricity use within parts of our manufacturing site processes (see last bullet above) is more likely to be practicable.

Maximising the use of electricity for trucking decarbonisation

In addition to freight decarbonisation pathways that may be considered under a long-term national supply chain strategy (see below section on a national supply chain strategy), we note that decarbonising trucking will likely require either electrification and/or hydrogen refuelling stations located throughout New Zealand. These stations will require considerable planning and capital upgrades to surrounding infrastructure and could increase demand on the national electricity grid. A fair and equitable solution that does not penalise existing users will need to be found to fund any required capital upgrades and help achieve decarbonisation pathways set out in the Climate Change Commission's Final Advice.

Biogas

As recognised in the Climate Change Commission's Final Advice, Government may wish to look at how it could develop local biogas systems, including by assisting local government to utilise existing natural gas assets both in residential and industrial areas to create regional biogas plants. This could be achieved by using a bio-digester to capture bio-methane from waste food and other organics diverted away from landfills. Current studies have shown that there is potential for over 13PJ of biomethane to be generated in this way - enough to supply all the North Island's residential, commercial and food manufacture needs.

This energy could then be recycled in the local energy system or reinjected into the national grid where it can be used to decarbonise the existing users at an overall lower capital cost compared to appliance and boiler replacement. This solution is dependent on the existing gas transportation pipelines being maintained into the future while facing decreases in revenue to fund their operation due to deindustrialisation and decarbonisation of electrical generation. The transition to biomethane injection into the gas transmission system can start now as the technology is mature.

These plants would help to generate employment in regional New Zealand; help to reduce the volume of material that is going to landfill and will produce a valuable soil fertiliser; and would also allow local councils to meet the increasingly stringent wastewater processing requirements. The resulting solids produced from anaerobic digestion can be used as a soil fertiliser thereby recycling valuable micronutrients and reducing the need for synthetic fertilisers.

For our Co-operative, transitioning off coal in our manufacturing sites by 2037 presents a substantial challenge. We believe it is achievable and that a well-designed Infrastructure Strategy which acknowledges the importance of natural gas during the transition, as well as opportunities for at least partial electrification and new energy sources (such as biogas) would make a meaningful difference to our efforts. More generally, it would help New Zealand identify the most efficient means of increasing our energy generation capabilities in the coming years to meet increased demand (e.g. for projected growth in recycling and electrified transportation) while decreasing associated emissions.

A long-term national supply chain strategy

- **Fonterra supports the development of an evidence-based long-term national supply chain strategy, as part of a wider New Zealand Infrastructure Strategy**

The efficiency, reliability and cost-effectiveness of the freight supply chain is critical to New Zealand and its emission reduction budgets. The nature of New Zealand's agricultural sector means significant quantities of inputs, ingredients and finished products are transported around the country and exported from our ports and will continue to be in the coming decades. As New Zealand transitions to a zero-carbon economy, it will be important to ensure future freight transport is both as carbon-efficient and as cost-effective as possible. This could be achieved in part by a long-term national strategy that 1) optimises freight transport for efficiency and sustainability across road, rail and coastal shipping and 2) enjoys broad support from users of New Zealand's freight transport network today. Close consultation with the sectors producing and transporting freight around New Zealand will be essential to the development of a practicable national freight supply chain strategy. In that context, we would welcome the opportunity to provide further information to the Commission on a possible long-term national supply chain strategy for freight.

We strongly support the Climate Change Commission's recommendation (in its recent Final Advice to Government) that emissions from freight can be reduced by switching some freight movements from road to rail, and through greater use of coastal shipping. This includes the creation of efficient freight corridors into and out of key logistics centres, by forming transport hubs that better connect road, rail and coastal shipping.

In our experience, moving product via rail rather than road brings significant environmental and road safety benefits. Increasingly shifting freight off roads and onto rail, where possible, is an important aspect of our strategy to reduce our environmental footprint. Fewer trucks also means safer, less congested roads, for instance around rural schools or in quiet rural communities where heavy trucking volumes can cause considerable disruption. Greater coordination and alignment between significant freight movers, such as primary producers and KiwiRail, is needed to implement the Government's agenda. This includes the desire that short term pricing decisions by KiwiRail do not lead to freight being moved off railway lines and back onto roads. A national supply chain strategy could help achieve this, for instance, by considering an

alternative governance structure for KiwiRail that takes into account its potential decarbonisation contribution and sets a clear purpose for KiwiRail to deliver a cost-competitive service to citizens and industry and focuses management on delivering against this objective.

An evidence-based national supply chain strategy could also consider the role biofuels could play in New Zealand's road freight transport system. In 2014, Fonterra partnered with Z Energy to help introduce biofuel to New Zealand and before the initiative was discontinued in 2020, we found it to be a positive interim step in reducing carbon emissions from our fleet of milk tankers. A national supply chain strategy would be an appropriate place to consider the role biofuels could play in making New Zealand's road freight transport more efficient.

More generally, a national freight supply chain strategy could also consider how to manage other significant transport issues associated with climate change and New Zealand's transition to a zero-carbon economy. These include:

- An increase in forestry in some regions may increase the wear and tear on rural roads which have not been built to cater for heavy logging vehicles. In these regions, roads may need to be upgraded to deal with increased logging truck movements;
- Whether some parts of New Zealand's road and rail networks may be vulnerable to sea-level rise or high river flow and flooding events and what capital investment is needed to improve network resiliency;
- How New Zealand should fund roading infrastructure given the potential decrease in fuel tax revenue and road-user charges as electric vehicles, rail and coastal shipping play a larger role in New Zealand's freight supply chain in the coming years.

Fonterra considers a freight supply chain strategy to be an excellent opportunity to redesign the way freight is moved around New Zealand, ensuring a more efficient, cost effective and lower-carbon system is developed to the long-term benefit of all New Zealanders. This system would place a greater emphasis on rail and coastal shipping, whereby reducing truck movements, transport emissions and road wear and tear, while simultaneously improving road safety and congestion.

If there is any further information the Commission would like from Fonterra regarding this submission, please do not hesitate to contact us.

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