



Role of Māori in the Transition to a Low-Emissions Economy

Discussion document for

Ministry for the Environment –
Manatū Mō Te Taiao

Prepared by

Dr Richard Meade
Cognitus Economic Insight®

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Abbreviations

CCC	Climate Change Commission
DER	Distributed energy resource – e.g. PV, and electrical storage (including batteries, and EVs with vehicle-to-grid (V2G) bi-directional charging)
EA	Electricity Authority
EDB	Electricity distribution business
ERP	Emissions reduction plan
ETS	Emissions trading scheme
EV	Electric vehicle (plug-in), also known as battery electric vehicle – see also HFCV
GHG	Greenhouse gas
HFCV	Hydrogen fuel cell vehicle (alternative form of electric vehicle) – see also EV
ICE	Internal combustion engine
IPR	Intellectual property right
MACA	Marine and Coastal Area (Takutai Moana) Act
MBIE	Ministry of Business, Innovation and Employment
MfE	Ministry for the Environment
MoT	Ministry of Transport
NZTA	New Zealand Transport Agency
PPP	Public-private partnership
PSGE	Post-settlement governance entity
PV	Photo-voltaic solar panels
RMA	Resource Management Act
STEM	Science, technology, engineering and mathematics
TPK	Te Puni Kōkiri
V2G	Vehicle-to-grid
WoF	Warrant of fitness

About the Author

Dr Richard Meade is Principal Economist at Cognitus Economic Insight®, Senior Research Fellow at Auckland University of Technology, and Vice President Auckland of the Law & Economics Association of New Zealand. For almost 30 years he has been assisting iwi and other Māori organisations with Treaty settlement negotiations, tribal governance design, expert evidence in Tribunal resumption applications and court proceedings, commercial advice and negotiations, and socio-economic policy advice and analyses.

Richard has research and consulting experience in sectors including electricity, transport, forestry, agriculture and fishing/aquaculture. More recently his research and advisory work has centred on how regulation needs to be repositioned in anticipation of disruptive new technologies, business models and players, in sectors like electricity and transport. He regularly presents on these themes to regulators and policymakers in New Zealand and Australia, and presents his research at local and international academic conferences. Richard was external Strategy Director on the Ministry of Transport's Regulation 2025 project, looking at how transport regulation needs to be repositioned in anticipation of innovations in transport technologies and business models.

Richard holds a PhD in Industrial Organisation and Regulation from Toulouse School of Economics. His research includes analyses of competition and regulation issues in utility sectors (like electricity), how tribal ownership or other ownership forms such as customer ownership affect organisational governance and outcomes, and using non-market valuation techniques to value non-traded things like culture, as well as options techniques for valuing development options. He has taught industrial organisation, environmental economics, and corporate finance at various universities, and has been a peer reviewer for the International Journal of Industrial Organization, Journal of Institutional and Theoretical Economics, Economic Modelling, New Zealand Economic Papers, and New Zealand Treasury Working Papers.

Executive Summary

In January 2021, the Climate Change Commission (CCC) released draft advice for consultation setting out ambitious recommendations for reducing Aotearoa's greenhouse gas (GHG) emissions by 2050, as part of Aotearoa's contribution to addressing global climate change.

The purpose of this discussion document is to provide Māori with information about the CCC's recommendations – in terms of both the opportunities they might present, but also risks, barriers and issues Māori might face as a consequence of the recommendations. The intention is that providing this information will enable more informed engagement between Māori and the Crown for identifying and navigating the role of Māori in the transition to a low-emissions economy.

The document starts by outlining from where – economically, socially and culturally – Māori begin this transition, since that affects whether the CCC's recommendations present opportunities, or risks/barriers. Key sectors in terms of Māori assets and employment are highlighted, to identify where the CCC's recommendations might have particular impacts on Māori, or present particular opportunities. Unsurprisingly, for historical and cultural reasons these sectors are based heavily in natural resources, including agriculture, forestry and fishing (and related processing).

The diversity of Māori asset-owning organisations is also highlighted, with some organisations very well-equipped to pursue any opportunities presented by the CCC's recommendations, or to manage any risks/issues they present. Others, however, face long-standing institutional and other challenges, meaning they are less well-placed, and in far greater need of targeted support to successfully navigate the transition. The possibility of late-developing Māori resource owners being locked in to low-emissions resource uses is a particular challenge that any transition to a low-emissions economy will need to address.

Key socio-economic disadvantages often experienced by Māori whānau are highlighted, since they give rise to particular vulnerabilities in relation to the CCC's recommendations. This is especially for Māori who are low-income, low-skilled, renting, living significant distances from work and education opportunities, and/or without good access to reliable, affordable, and safe public transport. They can expect to be significantly exposed to rising costs of living, access issues, and other disadvantages. This is from increased transport, electricity and heating costs, potentially made worse by strong reliance on private cars for transport, with the identified Māori groups at particular risk of being locked in to existing vehicle and heating technologies. It is also due to factors such as lack of resources or ability to access more efficient technologies like EVs and heat pumps, and challenges in accessing quality housing, public/active transport, and remote working.

Māori cultural assets in navigating the transition are also emphasised. In particular, there is a growing trend globally towards customers, capital suppliers and employees placing a premium on the organisations they deal with having values coinciding with their own. Māori cultural values in terms of sustainability, community development and intergenerational focus are just some examples of the values increasingly sought by these other parties. The CCC's recommendations present possible opportunities for these cultural assets to be used to the advantage of Māori.

With this context in mind, this document summarises the CCC's main recommendations, as well as opportunities, issues and barriers, arising for Māori. Reflecting the main focuses of those recommendations, this is done for each of the following key headings – transport, electricity and non-industrial heating, agriculture and forestry, and industrial process heat. Each discussion also traverses possible policies and other measures that might be necessary to secure opportunities presented by the CCC's recommendations, and to minimise any risks/barriers they create.

The CCC's recommendations certainly present opportunities for Māori. However, those opportunities are highly contingent on Māori being able to access information, targeted support and other resources – particularly where those concerned are starting with well-known challenges. Conversely, the CCC's recommendations very clearly present risks/barriers and other issues to many Māori, for which targeted assistance will be essential if the transition to a low-emissions economy is not to exacerbate any existing disadvantages.

Specific policies and other measures are suggested in relation to the CCC's recommendations for the key sectors outlined above. Additionally – and critically for a radical transition that is to span almost 30 years to 2050 – a key challenge will be to ensure that Māori are able to exercise meaningful authority over how the transition to a low-emissions economy is to be traversed. The final section of this document discusses the CCC's recommendations for ensuring that partnership between Māori and the Crown is achieved, as well as a just transition.

This document is structured with summaries of key points at the beginning of each major section, as well as key questions for Māori to consider presented at the end of each section. These questions, especially, should help to stimulate more informed engagement between Māori and the Crown as to how the transition to a low-emissions economy might improve – rather than exacerbate – the wellbeing of current and future generations of Māori.

While the transition will take almost 30 years, the need to create the right pathway for its achievement is urgent. Key decisions are required now that will determine whether Māori are able to benefit from the transition, or face greater obstacles to socio-economic development. This document is intended to assist Māori in engaging with the Crown on a better informed basis, and to share the responsibility for taking these decisions where they have particular impact on Māori.

1. Introduction

1.1 Context

1. Aotearoa/New Zealand's Climate Change Response Act 2002 is the principal legislation setting out how New Zealand intends to respond to climate change.
2. The Climate Change Response (Zero Carbon) Amendment, passed into law in November 2019, introduced two important changes to the Climate Change Response Act:
 - 2.1. It committed Aotearoa to reduce its greenhouse gas (GHG) emissions by specific amounts (the 2050 Target), namely:
 - 2.1.1. To achieve net zero emissions of long-lived greenhouse gases like carbon dioxide (CO₂) by 2050; and
 - 2.1.2. To reduce methane emissions from agriculture and other “biogenic” sources by 24% to 47% relative to 2017 levels, also by 2050 (with an interim reduction of 10% by 2030); and
 - 2.2. It established a new Crown entity called He Pou a Rangi – the Climate Change Commission (CCC) – to do things like reviewing the 2050 Target, and to assist government with the preparation of emissions budgets and tracking of progress against those budgets.
3. In January 2021 the CCC released a report entitled *2021 Draft Advice for Consultation*, (the CCC Report) setting out its recommendations for how Aotearoa can meet the 2050 Targets including proposed emissions budgets for 2022-25, 2026-2030 and 2031-2035:
 - 3.1. Those recommendations represent a radical transformation of Aotearoa's energy, transport, emissions-intensive industrial, agriculture and forestry sectors, with major implications for households, employment and business.¹

¹ At time of writing, the CCC had finalised this report, but had not yet made it public. Hence this document is based on the CCC's draft advice.

4. To assist with implementation of emissions budgets, the Ministry for the Environment (MfE) is required to prepare an initial emissions reduction plan (ERP):
 - 4.1. To prepare its initial ERP, MfE wishes to understand how Māori see their role in the transition to a low-emissions economy.

1.2 Purpose of this Discussion Document

5. This discussion document intends to assist MfE in preparing its initial ERP by providing Māori with information about:
 - 5.1. What the CCC Report is recommending;
 - 5.2. How these recommendations might affect Māori households and wider whānui, as well as Māori businesses and asset owners – in terms of both opportunities and risks/barriers; and
 - 5.3. What types of policies or support measures might be required to maximise opportunities to Māori from the transformation envisaged by the CC Report – and also to minimise possible harms to Māori from those recommendations.
6. This discussion document does not analyse or critique the CCC Report and its recommendations – rather, it takes those as given.² It also does not attempt to state how Māori see their role in the transition to a low-emissions economy – that will result from subsequent engagement by MfE and other Crown agencies with Māori.
7. Rather, the purpose of providing the information in this document is to enable more informed discussion, debate and engagement between MfE and other Crown agencies on the one hand, and Māori whānui and entities on the other, so that how Māori see their role in the transition to the type of low-emissions economy envisaged in the CCC Report can be better understood. While this document is not the result of engagement between Māori and the Crown, it is intended to provide a platform for such engagement to occur on a better-informed basis.

² Also out of scope is any analysis of the impacts of climate change itself, or of the relative merits of climate change adaptation and mitigation.

8. While the CCC Report's recommendations very much affect Aotearoa's economy, the focus of this document is very much on Māori households and people as much as it is about Māori businesses and asset owners:

- 8.1. Since the wholesale transformation of Aotearoa's economy is being envisaged by the CCC's recommendations, this document does not attempt to examine all relevant issues in great detail;

- 8.2. Instead it seeks to identify key areas of opportunity and risk or impediment to Māori, and high-level policies or other measures that maximise such opportunities and minimise risks/barriers.

1.3 Summarising the Climate Change Commission's Recommendations

9. Figure 1.1 repeats Figure 2.1 of the CCC Report, depicting where Aotearoa's GHG emissions come from. In short:

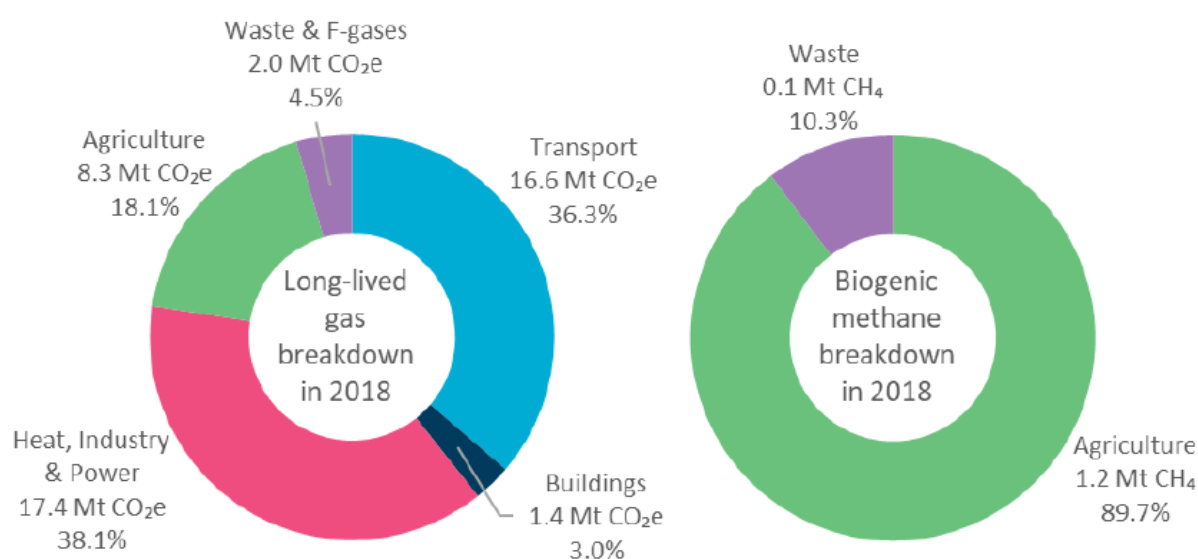
- 9.1. Agriculture is the single largest source of emissions, recognising that although biogenic methane is shorter-lived in the atmosphere than long-lived GHGs like CO₂, it has a significantly higher atmospheric warming potential;

- 9.2. Emissions from heating, industrial processes and electricity generation are the next largest, followed closely by transport emissions, with emissions from other sources (e.g. waste) being relatively minor.

10. Table 1.1 repeats Table 3.1 of the CCC Report, summarising how the CCC sees Aotearoa transitioning to a low-emissions economy. In short, the CCC recommends that:

- 10.1. **Transport** – the transport sector should ultimately move away nearly completely from fossil fuels like petrol and diesel, meaning among other things that only electric vehicles (EVs) or other low-emissions vehicles should be able to be imported in the near future, biofuels should be used where appropriate, and changes should be made to reduce travel, and increase the use of public transport as well as active transport (walking, cycling, etc);

Figure 1.1 – Breakdown of Aotearoa’s 2018 GHG Emissions by Source



Source: Figure 2.1 of Climate Change Commission (2021).

- 10.2. **Electricity** – although Aotearoa’s electricity system is already largely based on renewable energy sources like hydro, geothermal and wind, it should move almost completely away from using gas and coal generation (and retire certain geothermal generation that emits significant GHGs), while expanding renewable sources like wind, and solar;
- 10.3. **Gas and coal** – other uses of gas and coal for things like heating and industrial processes should almost completely be switched to renewable sources like electricity and biomass, complemented by improving the insulation of houses and other buildings to reduce heating needs;
- 10.4. **Agriculture** – on-farm practices and improved herd genetics should be adopted to reduce emissions, as well as things like methane inhibitors and other low-methane technologies (e.g. vaccines) as and when they become available;
- 10.5. **Forestry** – continue planting exotic plantation forests, ramp up plantings of native forests, but ultimately wind back planting of exotic forests just for carbon storage (to reduce reliance on continually planting forests to offset emissions elsewhere, and instead focus on reducing those emissions directly); and
- 10.6. **Waste** – reduce the amount of organic waste reaching landfills (which generates methane), but also improve how landfill methane is captured.

Table 1.1 – How the CCC Sees Aotearoa Transitioning to a Low-Emissions Economy

	Budget 1	Budget 2	Budget 3
Transport	Road transport	Accelerate EV uptake Improve average efficiency of new ICE vehicles	Phase out new light ICE vehicles Electrify medium and heavy trucks
	Reducing travel demand	Encourage remote working for those who can Encourage switching to walking, cycling and public transport	
	Non-road transport	Electrification of rail	Biofuel blending Start electrification of ferries and coastal shipping
Heat, Industry and Power	Buildings	No new gas heating systems installed after 2025 Improve thermal efficiency	Start phase out of gas in buildings
	Electricity	Phase out fossil base-load generation	Transmission and distribution grid upgrades Reduce geothermal emissions
	Industrial process heat	Replace coal with biomass and electricity	Replace gas with biomass and electricity
	Agriculture	Adopt low emissions practices on-farm	Adopt low emissions breeding for sheep Encourage the adoption of new low methane technologies when available
Land	Native Forests	Ramp up establishing new native forests	Establish 25,000 hectares per year
	Exotic Forests	Average 25,000 hectares per year of new exotic plantation forests	Ramp down planting new exotic plantation forests for carbon storage
Waste and F-gases	Waste	Divert organic waste from landfill Improve and extend landfill gas capture	
	Hydrofluorocarbons (HFCs)	Reduce import of HFCs in second-hand products Increase end-of-life recovery	

Source: Table 3.1 of Climate Change Commission (2021).

11. To achieve the required changes, the CCC advises that business as usual policies and targets will not be enough, and that further changes are required. It also advises that Aotearoa's emissions trading scheme (ETS), which puts a price on GHG emissions, will not be enough by itself to achieve the required changes – further policy measures will be needed:
 - 11.1. Since many of the required changes involve retiring existing long-lived investments or making new ones, the CCC's strategy is to provide an early signal of what is required, so technologies, assets and infrastructure can be changed as required on

as natural an investment cycle as possible (e.g. when existing assets require replacement); and

- 11.2. More generally, the CCC's approach is to seek reductions in gross GHG emissions where feasible, and leave carbon removals (e.g. through forestry) to offset sectors whose emissions are hard to reduce.
12. The CCC stresses that the transition to a low-emissions economy needs to be fair, equitable and inclusive (a "just transition"). It therefore stresses that various types of policies and support measures will be essential if its emissions budget goals are to be achieved in a way that:
 - 12.1. Does not create or perpetuate disadvantage; and
 - 12.2. Which provides opportunities for all to benefit from opportunities and benefits presented by the transition.
13. In short, the CCC Report says (p. 11):

"The transition must reduce emissions at pace while allowing the country to continue to grow, so that future generations inherit a thriving, climate-resilient and low emissions Aotearoa."
14. The CCC Report does not specify the required types of policies and support measures in any detail. This document provides examples of the sorts of policies and support measures that Māori might require to maximise opportunities and minimise risks from the "just transition" the CCC recommends.

1.4 Main Opportunities for Māori in the Transition to a Low-Emissions Economy

Transport

15. The main opportunities for Māori in the transition to low-emissions transport include (see Section 3):
 - 15.1. Improved product or service differentiation for Māori producers that use low-emissions transport in their supply chains;
 - 15.2. Creating community-level shared, public or active transport options better tailored to Māori needs;

- 15.3. Partnering with electricity sector providers such as electricity distribution businesses (EDBs) to develop low-cost options for supplying EV charging infrastructure in areas where existing distribution networks would be prohibitively costly to upgrade;
- 15.4. Exploring possibilities such as EV repairs and maintenance, or refurbishing or recycling used EV batteries; and
- 15.5. Participating in the development of clean hydrogen production, and rollout of refuelling infrastructure for heavy road vehicles, and ultimately passenger vehicles.

Electricity and Non-Industrial Heating

- 16. The main opportunities for Māori in the transition to low-emissions electricity and non-industrial heating include (see Section 4):
 - 16.1. Investments in renewable electricity generation – especially geothermal, and offshore wind, solar and tidal;
 - 16.2. Possible hydrogen production;
 - 16.3. Building energy efficiency assessments, and retrofitting buildings with insulation and efficient low-emissions heating; and
 - 16.4. Sustainability branding as part of wider Māori values branding.

Agriculture and Forestry

- 17. The main opportunities for Māori in the transition to low-emissions agriculture and growing forestry include (see Section 5):
 - 17.1. Reduced competitive disadvantage relative to non-Māori farmers;
 - 17.2. Sustainable competitive advantage through differentiation based on Māori values;
 - 17.3. Improvements in farm profitability from improved practices;
 - 17.4. Employment opportunities in farm monitoring, information/advice, and low-emissions technologies;

- 17.5. Cultural and commercial co-benefits – and employment possibilities – from native afforestation; and
- 17.6. Use of biomass and natural fibres for sustainable fuels, heating and insulation.

Industrial Process Heat

- 18. The main opportunities for Māori in the transition to low-emissions industrial process heat include (see Section 6):
 - 18.1. The bundling of Māori values in processed food products to achieve premiums from differentiated offerings; and
 - 18.2. Supplying and transporting the required biomass for low-emissions heating, investing in renewable generation, and/or hydrogen production.

1.5 Main Risks/Barriers for Māori in the Transition to a Low-Emissions Economy

Transport

- 19. The main risks/barriers for Māori in the transition to low-emissions transport include (see Section 3):
 - 19.1. Low-income, renting, and non-urban Māori are going to face significant barriers to EV uptake, potentially locking them in to using ICE vehicles – made worse by the CCC's proposed ban on imports of such vehicles – with a range of serious adverse consequences including increased cost of living due to predicted fuel price increases, worsening safety, increased incarceration risk, and rising emissions as vehicles age.
 - 19.2. The CCC is also recommending reductions in the use of private passenger vehicles, such as through increased home working, greater use of public and active transport (walking, cycling, etc), and improved urban design and transport system integration – this is going to be harder to achieve for many Māori households, meaning they will remain reliant on private passenger vehicles and face increased cost of living as a consequence.

- 19.3. Māori may have particular cultural concerns regarding the sustainability and ethics of EV production (especially EV batteries), as well as regarding possible environmental impacts of EV batteries when they reach end of life.

Electricity and Non-Industrial Heating

20. The main risks/barriers for Māori in the transition to low-emissions electricity and non-industrial heating include (see Section 4):

- 20.1. Low-income and renting Māori, marae, papakāinga, and Māori social housing all face barriers to improving home and building insulation, switching to energy-efficient heating, and bearing any increase in ongoing heating costs where higher-emissions alternatives are cheaper to buy and operate.

Agriculture and Forestry

21. The main risks/barriers for Māori in the transition to low-emissions agriculture and growing forestry include (see Section 5):

- 21.1. Farming and forestry are important sectors for Māori asset owners and jobs, and there is a risk that the CCC's recommendations might lock late-developing Māori landowners into lower-value land uses, as has happened with the ETS and other schemes (especially when any free emissions rights are allocated based on historical emissions – i.e. “grandparented” – meaning late-developing and relatively low-emissions landowners receive smaller free allocations).
- 21.2. Furthermore, some Māori landowners face governance, management and capital access constraints that might impede their uptake of least-cost – or even profitable – changes to on-farm practices and livestock genetics in order to achieve required emission reductions.

Industrial Process Heat

22. The main risks/barriers for Māori in the transition to low-emissions industrial process heat include (see Section 6):

- 22.1. Food processors, especially smaller Māori-owned ones, may require assistance in identifying least-cost options, and to cover the capital and increased operating costs associated with switching to higher-cost fuels – especially if additional

investments in fuel supply infrastructure are required – if the CCC's recommendations are to be achieved in a timely way.

1.6 Structure of this Discussion Document

23. The balance of this document is structured as follows:
 - 23.1. Section 2 provides details of Māori households, workers, businesses and asset owners – this is to provide **context** for assessing how Māori might benefit from the transition to a low-emissions economy, and what risks or barriers Māori might face in the transition;
 - 23.2. Section 3 discusses opportunities and risks/barriers for Māori in relation to the CCC's recommendations for **transport** – the importance of transport to Māori for employment, whānau and cultural purposes will be emphasised, as well as the significance of transport costs for Māori households, and how those costs are affected by the affordability of suitable vehicles, as well as where Māori live, work, and travel to;
 - 23.3. Section 4 does likewise in relation to the CCC's recommendations for **electricity**, and **home heating** – emphasising how energy costs (like transport costs) are important for many Māori households and affected by factors like renting and the affordability of efficient appliances (e.g. heat pumps), and also discussing opportunities and risks/barriers for Māori from participating in electricity supply, as well as in improving the quality of housing and other buildings;
 - 23.4. Section 5 discusses opportunities and risks/barriers in relation to **agriculture** and **forestry** – emphasising the importance to Māori of being able to develop land in a way that meets inter-generational social and economic objectives, as well as environmental stewardship goals;
 - 23.5. Section 6 does likewise in relation to **industrial process heat**, where employment and profit impacts are likely to be pronounced for upstream industries (i.e. coal, and oil and gas) – for Māori, this especially includes meat processing; and
 - 23.6. Section 7 discusses **other considerations** and **concludes**.
24. In addition to discussing opportunities and risks/barriers, each of sections 2 through 6 also discuss possible policies or other measures that might either maximise opportunities to Māori, or minimise risks/barriers.

2. Context – From Where does the Transition Begin for Māori?

Key points from this section:

1. Te ao Māori, the Māori world view, is an essential starting point for the Māori transition to a low-emissions economy – it emphasises:
 - a. Likely Māori support for the intent of the CCC's recommendations;
 - b. Māori being concerned that no one is left behind in the transition, and that any existing disadvantage experienced by Māori should be addressed and not worsened by any transition; and
 - c. Māori wishing to exercise meaningful authority and control over how the transition is governed.
2. Māori assets and employment are particularly concentrated in primary sectors like agriculture, forestry and fishing, but also in emissions-intensive sectors like road transport.
3. There is a wide diversity of Māori asset-owning entities and businesses, some much better-placed than others to make a successful transition, and many likely to need support in the transition.
4. Many Māori experience well-understood socio-economic disadvantages that are particularly relevant to how they will experience the transition to a low-emissions economy, and what types of support they might need for the transition not to exacerbate existing inequalities.

2.1 Te Ao Māori³

25. Important cultural distinctives, when considering from where the Māori transition to a low-emissions economy begins, derive from te ao Māori (the Māori worldview). Key features include:

³ The author especially thanks Professor Pare Keiha and Dr David Hall, both of Auckland University of Technology, for helpful comments on a draft this section. Any errors or omissions in this section remain the responsibility of the author.

- 25.1. The interconnectedness of living and non-living things, including of tangata (people) and te taiao (the natural world/environment);
 - 25.2. Tangata having kaitiaki (guardianship) obligations towards te taiao, rooted in whakapapa and customary connections to ancestral lands (tūrangawaewae), including obligations to preserve and enhance the mauri (life force) of te taiao;
 - 25.3. An intergenerational focus – prioritising the hauora/wellbeing of future generations;
 - 25.4. Strength in unity and collective action (kotahitanga); and
 - 25.5. Care and respect for others (manaakitanga).
26. Additionally, value is placed on mātauranga Māori, Māori knowledge systems, as well as on Māori being able to exercise authority or control (tino rangatiratanga and mana Motuhake) over domains of importance and interest, in accordance with customary values (tikanga).
27. Taken together, these distinctives point to Māori:
- 27.1. Likely being strong supporters of the intent of the CCC's recommendations – namely of collectively working together with all people, in Aotearoa and globally, to preserve and restore the vitality and life-supporting capacity of the global climate for the benefit of present and future generations, by reducing GHG emissions;
 - 27.2. Being concerned that no one is left behind in the transition to a low-emissions economy, and in particular that any existing disadvantage experienced by Māori should be addressed and not worsened by any transition, including through appropriate support to maximise opportunities and minimise risks/barriers that the transition presents; and
 - 27.3. Wishing to exercise meaningful authority and control over how the transition is governed (including how the CCC itself is governed) at both national and local levels, and how Māori can pursue opportunities presented by the transition to a low-emissions economy, and address risks/barriers:
 - 27.3.1. Such a right is also affirmed under Te Tiriti (Treaty of Waitangi) principles.

2.2 Economic Context⁴

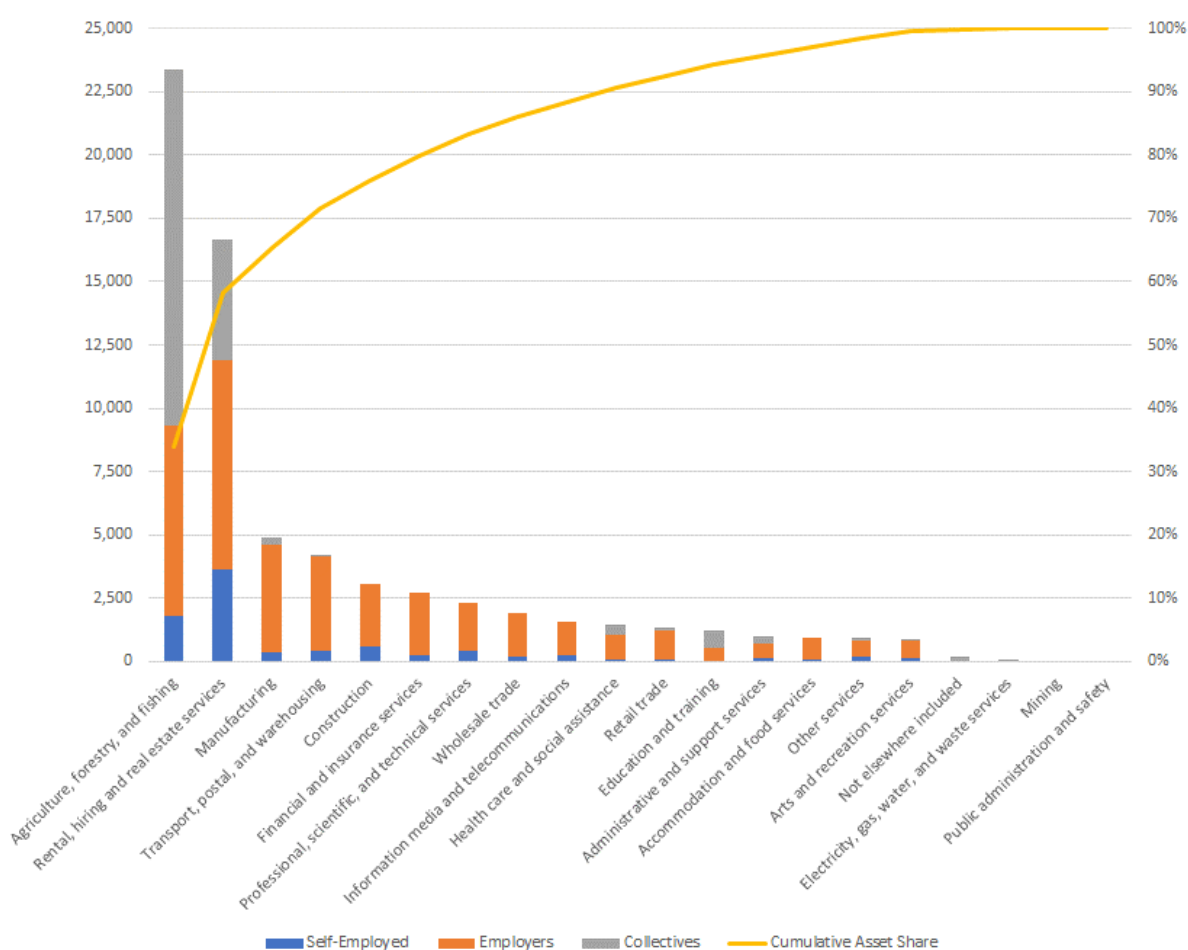
An Asset Base Dominated by Primary Sectors

28. Recent research by BERL estimates that the financial value of the Māori asset base in 2018 was \$68.7 billion.⁵
29. As shown in Figure 2.1, the Māori asset base comprises a significant share of primary sector assets – those in farming, forestry, and fishing/aquaculture. Taking those primary sector assets as a whole, they account for a third (34%) of Māori assets in 2018. The top six sectors, accounting for 80% of Māori assets, are:
 - 29.1. Agriculture, forestry, and fishing;
 - 29.2. Rental, hiring and real estate services – including commercial, industrial and residential property;
 - 29.3. Manufacturing;
 - 29.4. Transport, postal, and warehousing;
 - 29.5. Construction; and
 - 29.6. Financial and insurance services.
30. In terms of Māori primary sector assets, sheep and beef farming dominate. The top four primary sectors, accounting for almost 90% of Māori assets, are:
 - 30.1. Sheep and beef farming;
 - 30.2. Dairy;
 - 30.3. Forestry; and
 - 30.4. Fishing and aquaculture.

⁴ This section draws heavily on Section 4 of Meade and Rice (2021), which discusses the possible interests of Māori in a free trade agreement between Aotearoa and the UK.

⁵ BERL (2020a).

Figure 2.1 – Primary Sector Assets Account for a Third of the Māori Asset Base (2018 \$m)



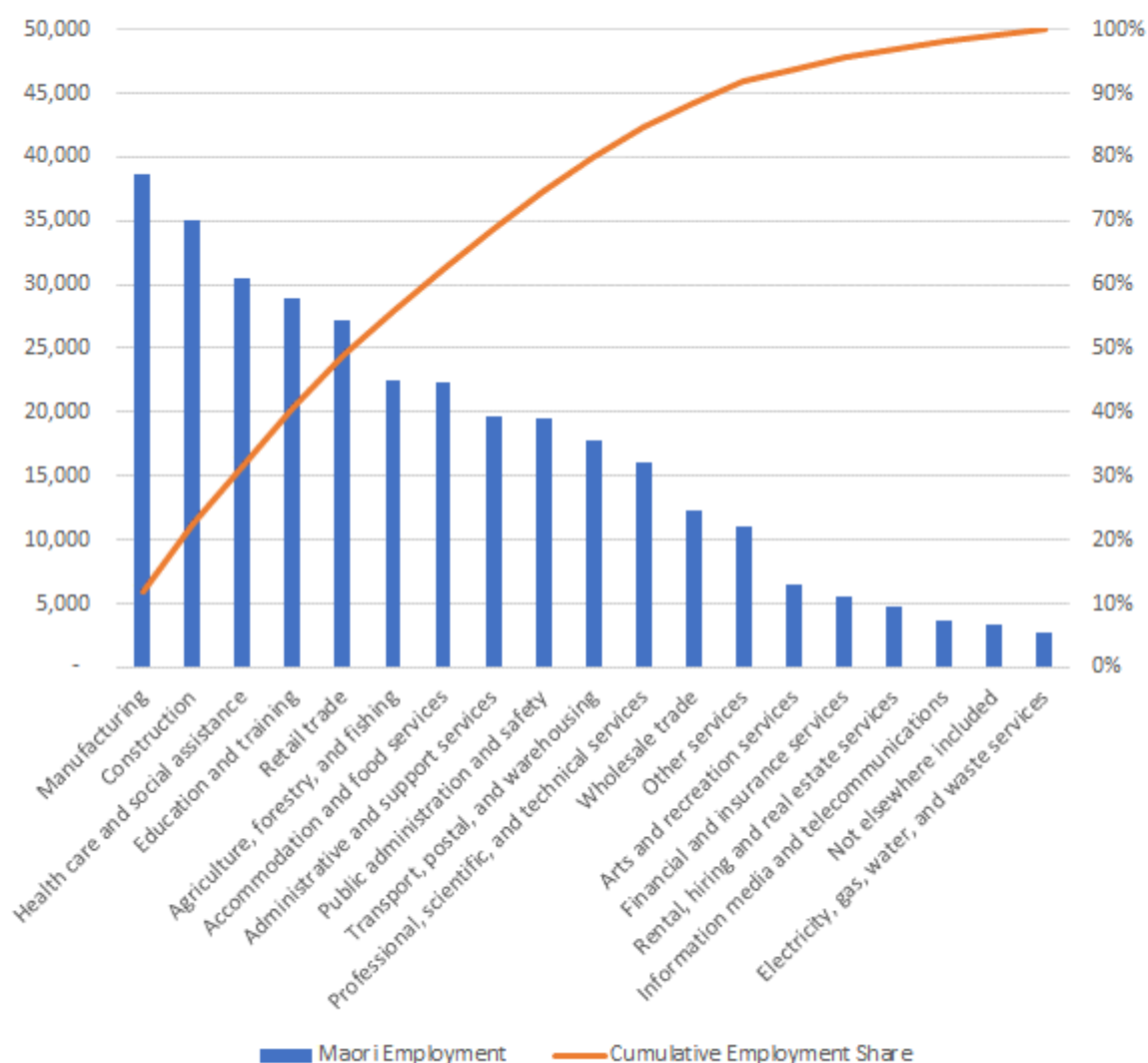
Source: Figure 4.1 of Meade and Rice (2021), based on data from BERL (2020a).

Employment also Significant in Primary and Related Processing Sectors, but also in Manufacturing and Construction

31. Figure 2.2 suggests that primary sectors (agriculture, forestry and fishing/aquaculture) are relatively modest Māori employers. Based on that figure, the top six sectors for Māori employment, accounting for over half of Māori employment, are ranked as follows:

- 31.1. Manufacturing;
- 31.2. Construction;
- 31.3. Health care and social assistance;
- 31.4. Education and training;
- 31.5. Retail trade; and

Figure 2.2 – Māori Employment by Sector (2018)



Source: Figure 4.5 of Meade and Rice (2021), based on data from BERL (2020a).

- 31.6. Agriculture, forestry, and fishing – mainly “other agriculture” (including contract shearers, pickers, and forestry support services such as planting, pruning, etc).
32. However, many Māori jobs are in sectors downstream of primary production, involved in processing food (especially meat) and wood products in particular:
 - 32.1. Counting these primary-related manufacturing jobs increases the total employment share from primary sectors and primary-related manufacturing to 14% – the highest employment share of all sectors (construction’s share is 11%).

Māori Employment is Also Clustered in Some Emissions-Intensive Sectors

33. Recent research by the Ministry of Business, Innovation and Employment (MBIE) highlights that a number of emissions-intensive sectors are important for Māori employment:⁶

33.1. These include sheep and beef farming, non-dairy meat manufacturing, and rail and road transport;

33.2. Importantly, employees in these sectors are predominantly male, Māori and less-qualified, with relatively low wages;

33.3. Gisborne is one of the four regions with the highest emissions-intensive activities; and

33.4. Agricultural industries also have a high rate of job churn and/or part-time work – possibly signalling pre-existing economic vulnerability.

34. Higher-paid high-emissions sectors like dairy manufacturing, metal manufacturing, chemical manufacturing, coal oil and gas, and electricity and gas supply are less significant for Māori employment.

Relatively Low Skill Base to Build Upon

35. As shown in BERL (2020a), Māori who are employers or who are self-employed are relatively high-skilled. However, employed Māori are significantly more lower-skilled. For such employees:

35.1. Their ability to upskill may be limited – e.g. due to being time-poor as a consequence of having to work long hours and possible have long commute times; and

35.2. Their employers can find it more attractive to invest in upskilling workers who are already higher-skilled – meaning older, low-skilled workers can be in particular need of retraining and other (e.g. relocation) assistance should they lose their job.

⁶ MBIE (2021).

Exposure to Disruption by Automation

36. Māori employment is also clustered in certain emissions-intensive industries that are likely to be at greater risk of disruption by automation (e.g. meat processing):

36.1. On the one hand, this means that the Māori employment impacts of a transition to a low-emissions economy might arise in sectors that are destined to experience disruptions in any case;

36.2. On the other hand, this highlights the importance of being able to retrain and/or relocate (etc) affected Māori workers, especially older, lower-paid workers.

Well-Known Challenges for Māori Landowners

37. Māori landowners face multiple, well-known challenges in developing their land.⁷ This is because of:

37.1. Characteristics of the land itself – e.g. land often being in small parcels or not well-located, and/or land-locked, hilly, marginal or erosion-prone; and

37.2. How the land is owned and managed – e.g.:

37.2.1. Multiple owners – often with each having so small an interest in the land that they have little interest in involving themselves with its management;

37.2.2. Barriers to accessing finance – e.g. due to land being inalienable;

37.2.3. Governance/management issues – e.g. with many land-owning organisations having no formal governance in place; and

37.2.4. Poor access to information – e.g. regarding best land uses, or how best to respond to relevant rules and regulations – including the CCC's recommendations.

38. That said, a number of prominent land-owning iwi organisations (e.g. post-settlement governance entities, PSGEs, and their subsidiaries), and Māori land trusts and incorporations, are very well-resourced, managed and governed:

⁷ E.g. see BERL (2020a), p. 12.

38.1. This points to a number of Māori asset owners being particularly well-placed to take advantage of opportunities presented by the transition to a low-emissions economy, and to manage any risks, challenges or barriers;

38.2. A great many others, however, will be less well-placed, and potentially in need for significant support:

38.2.1. These might include, for example, smaller Māori land-owning trusts and incorporations, for whom additional and tailored support may especially be needed

Relatively Low Profitability of Māori Businesses

39. Research across multiple sectors indicates that Māori businesses tend to have lower average profits than non-Māori businesses in the same sector.⁸

40. This is possibly due to multiple reasons, such as:

40.1. Aversion to using debt financing – or difficulties in accessing such financing; or

40.2. Perhaps prioritising providing employment opportunities to Māori over generating profits – this research indicates that Māori-owned business have workforces that are 43% Māori, while non-Māori owned businesses have workforces that are only 14% Māori.

41. Either way, this suggests some Māori businesses may lack the resources to fully take advantages of opportunities presented by the transition to a low-emissions economy, or to manage any risks/barriers associated with the transition.

Strengths of Māori Businesses

42. On the other hand, Te Puni Kōkiri (TPK) has identified a number of strengths of Māori businesses. They include:

42.1. **Low debt-equity ratios**, reflecting risk-aversion to debt as much as possible borrowing constraints – this makes Māori businesses less exposed to financial ups and downs;

⁸ TPK et al. (2020).

- 42.2. The use of **risk-sharing and capital-pooling** arrangements like joint ventures to scale up when taking advantage of opportunities;
 - 42.3. **Diversified interests** – some Māori organisations have a wide range of business interests, such as in private hospitals, retirement villages, wine, horticultural, geothermal energy, telecommunications, tourism and infrastructure;
 - 42.4. Strong focus on **quadruple bottom line** – Māori businesses are focussing on balancing social, cultural, environmental and business goals, including inter-generationally; and
 - 42.5. Prioritising accessing and developing **people skills**.
43. Importantly, Māori businesses' focus on multiple bottom lines includes differentiating themselves based on Māori values and mātauranga Māori:
- 43.1. This is increasingly valuable for attracting customers, capital suppliers and employees who value things like sustainability, community development, ethical production and social impact, e.g.:
 - 43.1.1. Many consumers are increasingly seeking suppliers whose values align with their own (and spurning those whose values do not),⁹ with evidence emerging of the importance of such values alignment for Māori producers¹⁰
 - 43.1.2. Sustainable, ethical and socially-responsible investing represents a sizeable and rapidly growing share of global investment funds under management (US\$30.7 trillion in 2018),¹¹ especially in countries like Aotearoa (where sustainable investing has a 63% market share); and
 - 43.1.3. Employers' values are increasingly seen as an important way to attract, recruit and incentivise employees sharing those values (i.e. who are possibly prepared to even accept a wage discount as a consequence of better values alignment).¹²

⁹ E.g. see Accenture (2018), or Deloitte (2016).

¹⁰ E.g. see Thomson (2015), Harmsworth (2005), or Baltus (2019).

¹¹ GSIA (2018).

¹² E.g. see Brekke and Nyborg (2008).

- 43.2. While businesses around the world will need to become more sustainable simply to remain competitive, Māori businesses will be able to continue to distinguish themselves in terms of their other distinct cultural values and features, potentially sustaining a competitive advantage.

2.3 Social/Cultural Context¹³

A Young and Rapidly Growing Population

44. As at the 2018 Census, the 775,000 Māori recorded represented 17% of Aotearoa's total population, up from 14% in 2013:¹⁴
- 44.1. In that timeframe, working age Māori increased by 50%, with Māori labour force participation also increasing, from 67% to 71%;
- 44.2. The Māori population is much younger than Aotearoa's non-Māori population, with 57% of Māori under the age of 30.
45. This young and rapidly growing Māori population will be key to the future of Aotearoa:
- 45.1. Failing to grapple with the long-standing challenges facing the Māori population – or with those presented by the transition to a low-emissions economy – will hold Aotearoa back from achieving its full potential;
- 45.2. Conversely, grappling with those challenges, and unlocking the full vitality, resourcefulness and creativity of Māori, can only enhance the wellbeing of all New Zealanders.
- 45.3. Zealanders, and Aotearoa's contributions to the world.

¹³ This section draws heavily on Section 4 of Meade and Rice (2021), which discusses the possible interests of Māori in a free trade agreement between Aotearoa and the UK.

¹⁴ Figures from BERL (2020a), and BERL (2020b).

Long-Standing Socio-Economic Deficits

46. It must be acknowledged, however, that the long-standing challenges confronting Māori remain significant. These include:

46.1. The poorest health status, on average, of all ethnicities in Aotearoa;¹⁵

46.2. A range of socio-economic indicators lagging behind those of non-Māori,¹⁶ including Māori being:

46.2.1. Much less likely to have completed secondary school;

46.2.2. Much more likely to be unemployed;

46.2.3. More likely to be on a low income – as at the 2018 Census, the median annual income of adult Māori was just 76% that of all New Zealanders, and only 70% that of European New Zealanders;¹⁷

46.2.4. Much more likely to be receiving income support;

46.2.5. More likely to be in a household with no telecommunications or internet;

46.2.6. More likely to not have access to a motor vehicle;

46.2.7. Much more likely to be renting, and living in a crowded house – as at the 2018 Census, the Māori home ownership rate was just 47.5%, as compares with a 65% rate for all New Zealanders;¹⁸ and

46.2.8. Enjoying much lower financial net worth than non-Māori.

¹⁵ Waitangi Tribunal (2019).

¹⁶ <https://www.health.govt.nz/our-work/populations/maori-health/tatau-kahukura-maori-health-statistics/nga-awe-o-te-hauora-socioeconomic-determinants-health/socioeconomic-indicators>.

¹⁷ Total personal income (grouped and median) and ethnic group (grouped total responses) by age group and sex, for the census usually resident population count aged 15 years and over, 2013 and 2018 Censuses (RC, TA, SA2, DHB). www.stats.govt.nz.

¹⁸ Statistics New Zealand, Estimated Households in Private Occupied Dwellings, As At Quarter Ended (Qrtly-Mar/Jun/Sep/Dec), www.stats.govt.nz.

Socio-Economic Deficits Reflected in Financial Net Worth Deficits

47. Regarding financial net worth deficits:¹⁹

47.1. The median wealth of Māori adults in 2018 was \$29,000, which is \$63,000 per adult less than all New Zealanders, and \$109,000 per adult less than European New Zealanders;

47.2. The mean wealth of Māori adults in 2018 was higher at \$204,000, but is \$155,000 per adult less than all New Zealanders, and \$207,000 per adult less than European New Zealanders.

48. These deficits could be especially important in affecting the ability of Māori households to afford low-emissions technologies like EVs, or to invest in healthy, well-insulated homes.

Composite Measures Highlight Māori Relative Socio-Economic Deprivation, Especially in Key Regions

49. Taking a broader view of the relative socio-economic position of Māori in Aotearoa, Figure 2.3 shows that Māori are significantly over-represented in terms of composite socio-economic deprivation measures relative to non-Māori, as measured by the NZDep2013 index often used by researchers and social policy analysts:

49.1. As shown in Figure 2.4 – socio-economic deprivation is particularly concentrated in the Far North and East Coast of the North Island, where Māori population shares are highest, but also in the Central North Island;

49.2. Using rohe definitions in BERL (2020a), and regional population data from the 2018 Census,²⁰ Māori population shares for these areas are:

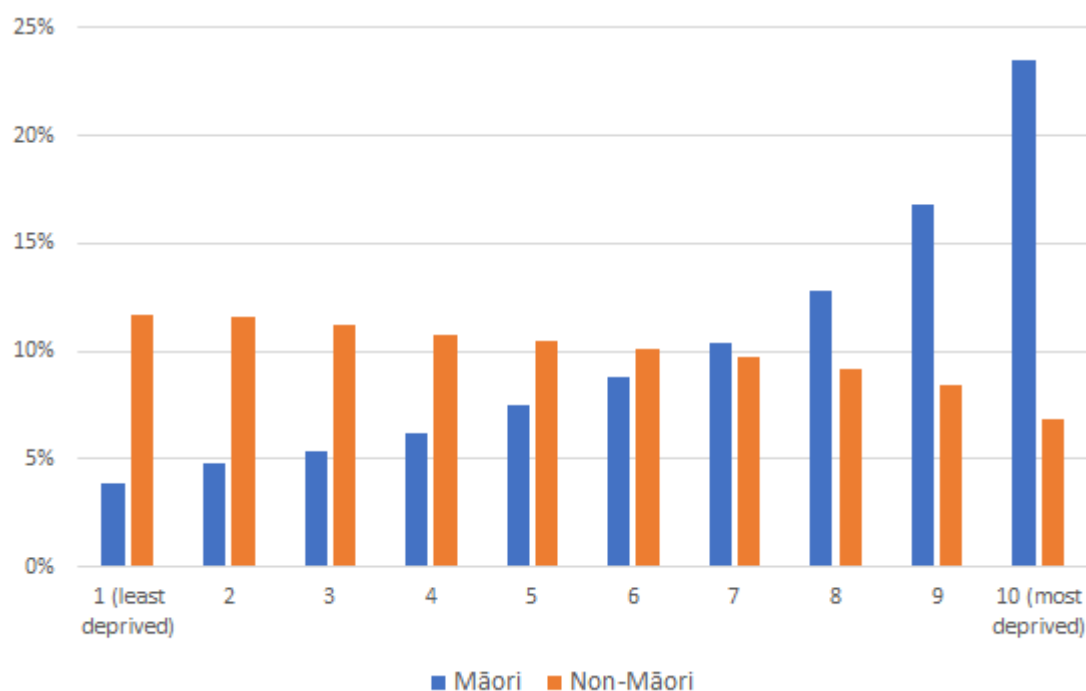
49.2.1. Far North – Te Tai Tokerau: 39%; and

49.2.2. East Coast of the North Island – Tairāwhiti (55%) and Te Moana a Toi-Waiariki (32%).

¹⁹ SNZ, Household net worth statistics: Year ended 30 June 2018, Table 8.01 (8.02): Individual assets and liabilities – median (mean) value, by ethnic group. www.stats.govt.nz.

²⁰ 2018-SA1-dataset-individual-part-1-total-NZ_updated_16-7-20. www.stats.govt.nz.

Figure 2.3 – Māori More Socio-Economically Deprived than Non-Māori (NZDep2013)



Source: Based on data from Ministry of Health Website.²¹

Summary

50. The Māori population is relatively young, and growing strongly. Unleashing the potential of that population will require a number of significant and long-standing socio-economic deficits to be addressed:

50.1. Significant land loss and population declines in the nineteenth century (due to both European diseases, and land wars) have been followed by equally significant social dislocations in more recent times, including:

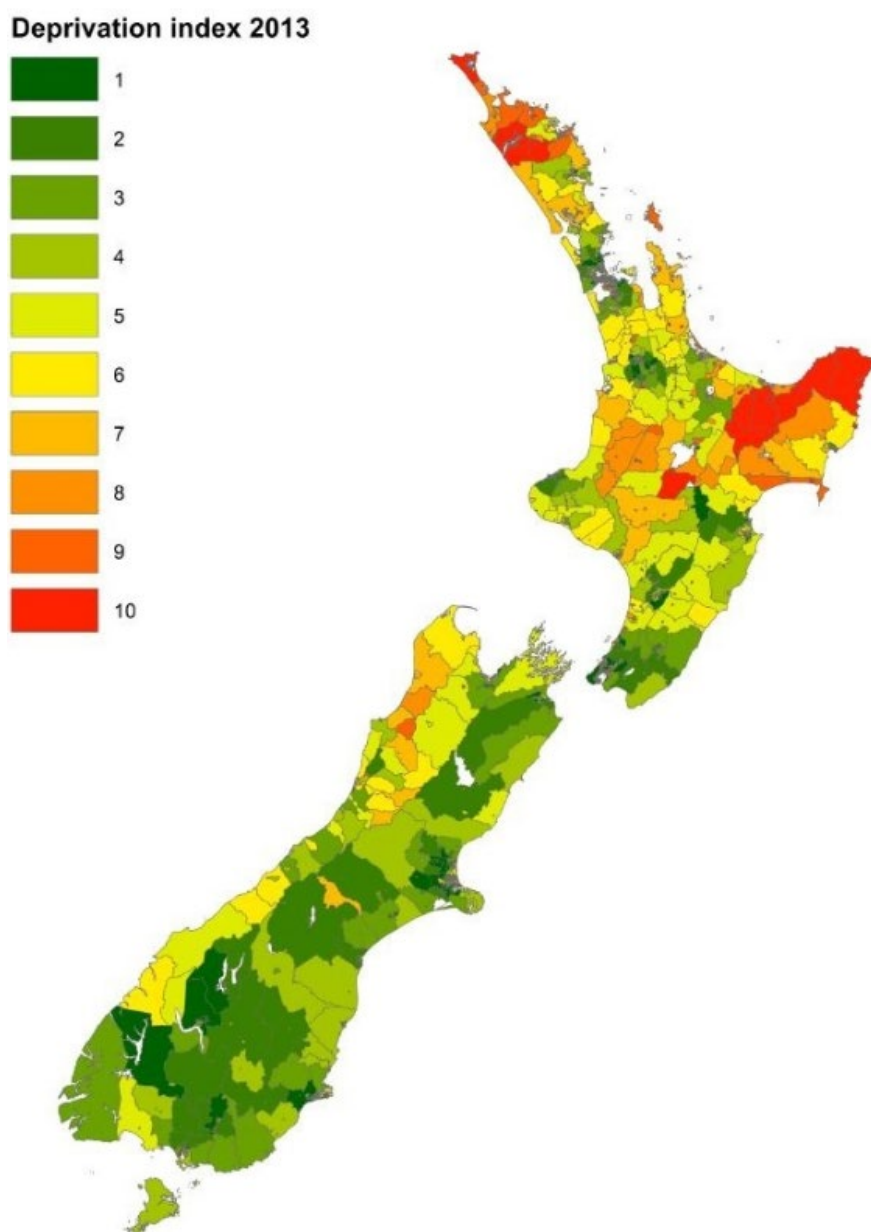
50.1.1. Disproportionate Māori loss of life World War II; and

50.1.2. Urban drift in search for work opportunities in the post-war period, accompanied by attempts at cultural assimilation (including not speaking te reo for generations), separating many Māori from their cultural roots; and

50.1.3. Relatively high unemployment rates as a consequence of economic reforms in the 1980s and 1990s.

²¹ <https://www.health.govt.nz/our-work/populations/maori-health/tatau-kahukura-maori-health-statistics/nga-awe-o-te-hauora-socioeconomic-determinants-health/neighbourhood-deprivation>.

Figure 2.4 – Socio-Economic Deprivation Concentrated in Regions with High Māori Population Shares



Source: BERL website.²²

51. Associated deficits in health have added to drags on Māori educational and labour market outcomes, reflected in relatively low incomes and home ownership rates:

51.1. These in turn are reflected in significantly lower financial net worth outcomes for Māori.

²² <https://berl.co.nz/economic-insights/migration-and-population/deprivation-index-2018>.

52. An important consequence of the urban drift of the Māori population since the world wars is that many Māori now reside some distance from their ancestral lands. For example, while Māori constitute only 13% of the Auckland population, Auckland Māori constitute around one quarter of the Māori population:²³
- 52.1. This means a significant proportion of Māori must travel significant distances to engage with whānau, and to participate in important cultural practices (e.g. tangi);²⁴
- 52.2. Furthermore, with the Auckland Māori population concentrated in key areas like Manurewa and Papakura, this raises particular travel and transport requirements for Auckland Māori for employment, family and cultural purposes.²⁵
53. All of these factors combine to perpetuate these challenges across generations of Māori. A consequence of these long-standing challenges is that Māori individuals, whānau and communities – like Māori businesses – are often relatively under-developed when compared with their non-Māori counterparts.

2.4 High-Level Implications for Māori in the Transition to a Low-Emissions Economy

Possible Opportunities Presented by the Transition – Māori Workers, Asset Owners and Businesses

54. Reducing agricultural emissions through improved farming practices and land use might in some situations improve both the profitability and sustainability of Māori land use, and potentially open up new employment opportunities (e.g. native tree planting, pest control):
- 54.1. Such reductions may become essential for Aotearoa's agricultural sector to remain globally competitive, as rival producers move to more sustainable practices in response to consumer and regulatory demands – due to cultural distinctives, Māori primary producers might be able to sustain a competitive advantage by increasingly incorporating Māori values into their land use.
55. Improving Aotearoa's housing stock and other buildings to make them more energy efficient, and to replace older technologies (heating, etc) with newer ones, are examples of

²³ 2018 Census Data.

²⁴ Raerino et al. (2013).

²⁵ Auckland Council (2013).

possible job and business opportunities for Māori, given the importance of the construction sector to Māori.

56. Further examples are discussed in later sections. What this section highlights is that realising opportunities like these will be relatively easy for well-resourced Māori asset owners and businesses, and skilled Māori workers:

56.1. For others, however, various types of support (also discussed later) will be critical if they are to be able to make use of these opportunities;

56.2. Also, for any such Māori concerns to make use of opportunities such as from native forestry for carbon sequestration, the viability of this will likely hinge on institutional innovations like introducing payments for ecosystem services (e.g. for erosion control, biodiversity, etc).

Possible Risks/Barriers Presented by the Transition – Māori Workers, Asset Owners and Businesses

57. This section highlights that some Māori asset owners and businesses, and Māori workers, face particular challenges already, and might face even greater challenges with the transition to a low-emissions economy:

57.1. Institutional constraints applying to how much Māori land is owned, governed and managed could present particular obstacles in adjusting to the need to reduce emissions;

57.2. Where such land is currently relatively under-developed, this could be exacerbated by current constraints on land use change (e.g. pre-1990 forestry deforestation liabilities under the ETS, or restrictive features of forestry licences such as those in relation to forest lands acquired through Te Tiriti settlements)²⁶, and by how agriculture is to be included in the low-emissions transition (e.g. grandparenting methane emissions rights to owners of more developed farms);

²⁶ When the associated land is returned to Māori ownership via settlements, Crown forestry licences require forest owners to surrender land that is no longer needed for forestry operations in relation to their existing tree crop. In practice this can result in piecemeal land returns, meaning the Māori landowners find it most economic to simply allow replanting in exotic forests by the existing forestry licensee.

- 57.3. Māori workers and communities may be particularly exposed to declines in certain emissions sectors, and less-skilled Māori workers – especially older ones – may find it particularly difficult to transition from declining sectors into growing ones.

Possible Opportunities Presented by the Transition – Māori Families and Communities

58. If Māori whānau and communities can embrace low-emissions technologies like EVs and heat pumps, and access healthier, better-insulated housing, this could significantly lower their cost of living, or allow them to enjoy better transport and housing (e.g. heating) services without increasing their cost of living, as well as realise health benefits (including from active transport like walking and cycling):

- 58.1. Furthermore, if the transport sector overall switches to low-emissions and more modern vehicles, this could improve air quality and health, reduce traffic noise and improve pedestrian and passenger safety.

59. Lower travel costs per km offered by more efficient transport options might also make it easier for Māori to stay connected with distant whānau and ancestral lands, offering cultural benefits.

60. Furthermore, employment opportunities in emerging sectors that are required to achieve a transition to a low-emissions economy might improve Māori household incomes – examples include:

- 60.1. The infrastructure required to support a fleet of EVs – e.g. recharging, repairs and maintenance, and end-of-life recycling and refurbishing;

- 60.2. Farm emissions monitoring systems, and forestry planting and silviculture; and

- 60.3. Pest control and fencing for indigenous forestry.

61. *Possible Risks/Barriers Presented by the Transition – Māori Families and Communities*

62. The opportunities to Māori whānau and communities described above hinge on big “ifs”:

- 62.1. The cost of new technologies, and barriers to their adoption arising from high rates of renting, could preclude many Māori from enjoying those opportunities, and instead lock them in to older technologies, potentially exacerbating existing disadvantages relative to non-Māori;

- 62.2. Likewise, existing deficits in educational outcomes and worker skills might limit the ability of many Māori to enjoy opportunities from the transition to a low-emissions economy, and lock them in to working in declining and/or low-wage sectors, rather than switching to growing or higher-wage sectors, which could also lead to increasing disadvantage.
63. These possible risks/barriers are further exacerbated by where many Māori live relative to work, whanau and ancestral lands:
- 63.1. Māori in urban areas face greater demand for travel to maintain cultural connections, while those in non-urban or more suburban areas face limited options for public transport or active transport, and large travel distances;
- 63.2. Even those Māori who live in urban areas with public transport and infrastructure for active transport (e.g. cycle lanes) can face significant distances to reach work, or work shifts for which public transport options are not available:
- 63.2.1. This means they are locked in to using private vehicles for transport, and potentially older ones if newer technologies are inadequate (due to range limits) or unaffordable.
64. Further opportunities and barriers/risks – as well as possible policies or other measures which address them – are discussed further in the following sections.

Key questions to consider in relation to this section:

1. What aspects of te ao Māori are most relevant in thinking about how Māori approach the transition to a low-emissions economy?
2. What are the key strengths of Māori whānui and collectives that create particular opportunities for Māori in the transition?
3. What are the main barriers and disadvantages Māori face in the transition, and how might those barriers and deficits affect outcomes for Māori in the transition?

3. Transport

Key points from this section:

1. The CCC is recommending the near-complete adoption of low-emissions vehicles (principally EVs) over a relatively short time-frame – this is going to be hard to achieve even with substantial support measures for EV uptake.
2. Low-income, renting, and non-urban Māori are going to face significant barriers to EV uptake, potentially locking them in to using ICE vehicles – made worse by the CCC's proposed ban on imports of such vehicles – with a range of serious adverse consequences including increased cost of living due to predicted fuel price increases, worsening safety, increased incarceration risk, and rising emissions as vehicles age.
3. The CCC is also recommending reductions in the use of private passenger vehicles, such as through increased home working, greater use of public and active transport (walking, cycling, etc), and improved urban design and transport system integration – this is going to be harder to achieve for many Māori households, meaning they will remain reliant on private passenger vehicles and face increased cost of living as a consequence.
4. Māori may have particular cultural concerns regarding the sustainability and ethics of EV production (especially EV batteries), as well as regarding possible environmental impacts of EV batteries when they reach end of life.
5. Possible opportunities for Māori in the transition to low-emissions transport include:
 - a. Improved product or service differentiation for Māori producers that use low-emissions transport in their supply chains;
 - b. Creating community-level shared, public or active transport options better tailored to Māori needs;
 - c. Partnering with electricity sector providers such as electricity distribution businesses (EDBs) to develop low-cost options for supplying EV charging infrastructure in areas where existing distribution networks would be prohibitively costly to upgrade;
 - d. Exploring possibilities such as EV repairs and maintenance, or refurbishing or recycling used EV batteries; and
 - e. Participating in the development of clean hydrogen production, and rollout of refuelling infrastructure for heavy road vehicles, and ultimately passenger vehicles.

3.1 What the CCC is Recommending

65. As discussed in Section 1.3, the CCC is recommending:

- 65.1. Drastically accelerating the uptake of EVs, including for road transport and also ferries and coastal/inshore fishing – including by way of a ban on imports of new internal combustion engine (ICE) vehicles in the near future; and
- 65.2. Reducing transport demand by encouraging remote working, and encouraging greater use of public transport and active transport (e.g. cycling, walking).

66. At p. 58 the CCC Report states:

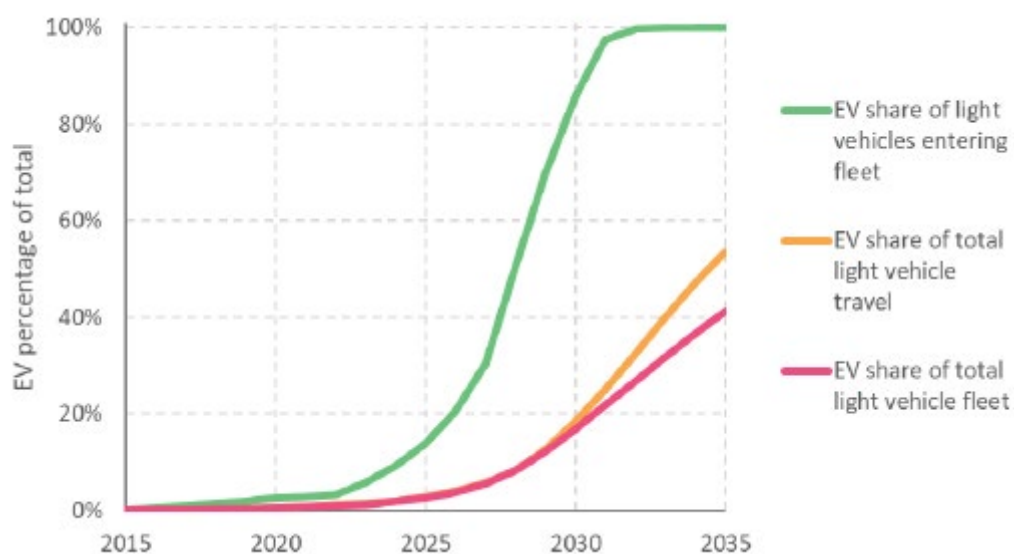
“In addition to changing the vehicles we drive, changes to how and how much New Zealanders travel play an important role in our path. We assume the average household travel distance per person can be reduced by around 7% by 2030, for example through more compact urban form and encouraging remote working. We also assume that the share of this distance travelled by walking, cycling and public transport can be increased by 25%, 95% and 120% respectively by 2030. Overall, this would see total household vehicle travel staying relatively flat despite a growing population.” [emphasis added]

67. Figure 3.1 illustrates the EV uptake path the CCC envisages to 2035, while Figure 3.2 illustrates the travel savings it anticipates from reduced travel demand and increased use of public and active transport modes.

68. In order to achieve a rapid uptake of EVs and otherwise reduce transport emissions, the CCC anticipates that a range of support measures will be needed to ensure an equitable transition to low-emissions transport. These include:

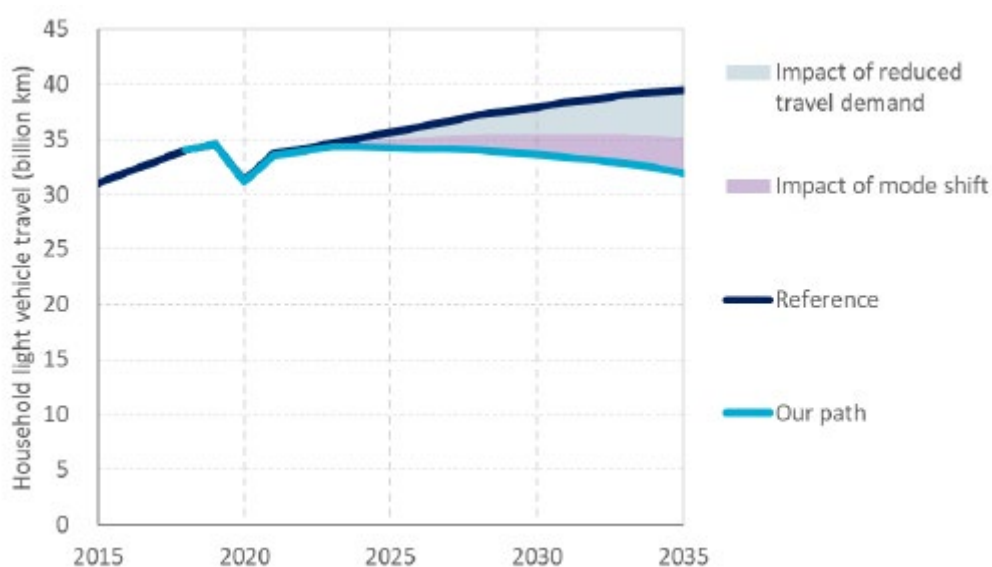
- 68.1. Restricting or banning the importation of ICE vehicles, and introducing vehicle fuel efficiency standards;
- 68.2. An “ambitious” package of policies, including proactive targeted assistance and incentives to lower the upfront cost of EVs (and electric bicycles) and to make them accessible to all New Zealanders;
- 68.3. Encouraging the rollout of EV chargers, including community charging stations to provide access to those who cannot have chargers at home (e.g. renters, apartment block residents, rural residents with inadequate electricity distribution infrastructure, etc);

Figure 3.1 – CCC's Anticipated Uptake Path for Electric Vehicles to 2035



Source: Figure 3.10 from the CCC Report

Figure 3.2 – CCC's Anticipated Demand for Light Vehicle Travel to 2035



Source: Figure 3.11 from the CCC Report

- 68.4. Encouraging the development of the second-hand EV market, as well as car sharing and leasing;
- 68.5. Building infrastructure for refurbishment, reuse, recycling and responsible disposal solutions for EV batteries (which can be highly polluting and a fire risk if not disposed of properly);

- 68.6. Improving public and active transport options, especially in urban areas, and also for those with disabilities or on low incomes – including through better integration of public transport and urban planning.

3.2 Factors Important for the Uptake of EVs

Combined Decisions Needed for EV Uptake

69. EV uptake reflects the combined decisions of:
- 69.1. Car buyers – including car buyers’ peers (whose experience with new technologies can be critical);²⁷
 - 69.2. Infrastructure providers – especially providers of charging infrastructure, but also electricity generators and distributors;
 - 69.3. Manufacturers and repairers – of EV-related equipment;
 - 69.4. Researchers – i.e. those designing cheaper and better batteries; and
 - 69.5. Governments and regulators – changing the relative benefits and costs of competing transport solutions through taxes, subsidies, standards, public transport choices, urban design, etc.

Norway’s Experience – The Posterchild of EV Uptake

70. The experience of other countries in encouraging the uptake of EVs holds important lessons for Aotearoa. Perhaps the greatest lesson is that even with substantial support for uptake, EV uptake has been very slow:
- 70.1. Norway is the leading example, where 20 years of generous support measures have only achieved a 15% vehicle fleet share for EVs despite the EV share of new vehicles having reached 75%.²⁸

²⁷ Evidence on the uptake of solar photovoltaic generation (PV, or “solar panels”) indicates that learning from peers’ experiences of new technologies can be important for uptake – e.g. Palm (2017).

²⁸ Broadbent et al. (2017), IEA (2021).

71. Norway's incentives included significant purchase subsidies, but also included "soft incentives" like:

71.1. Deployment of recharging infrastructure – Norway has the highest number of rechargers per million population;

71.2. Free recharging;

71.3. Free parking in public car parks;

71.4. Exemption from road and public ferry tolls; and

71.5. Free EV access to bus lanes.

Research on the Factors Driving EV Uptake

72. International research emphasises the following factors as being key for EV uptake:²⁹

72.1. **Availability of charging infrastructure** is a dominant factor – limited EV travelling range and long recharging times leads to "range anxiety" which means EV buyers need to be reassured they can access chargers – whether for local or long-range trips;

72.2. **Upfront purchase costs** are also critical – reducing the upfront cost of EVs through purchase subsidies and other incentives is also critical given they are currently much more expensive than ICE vehicles, especially for upfront rather than delayed incentives:

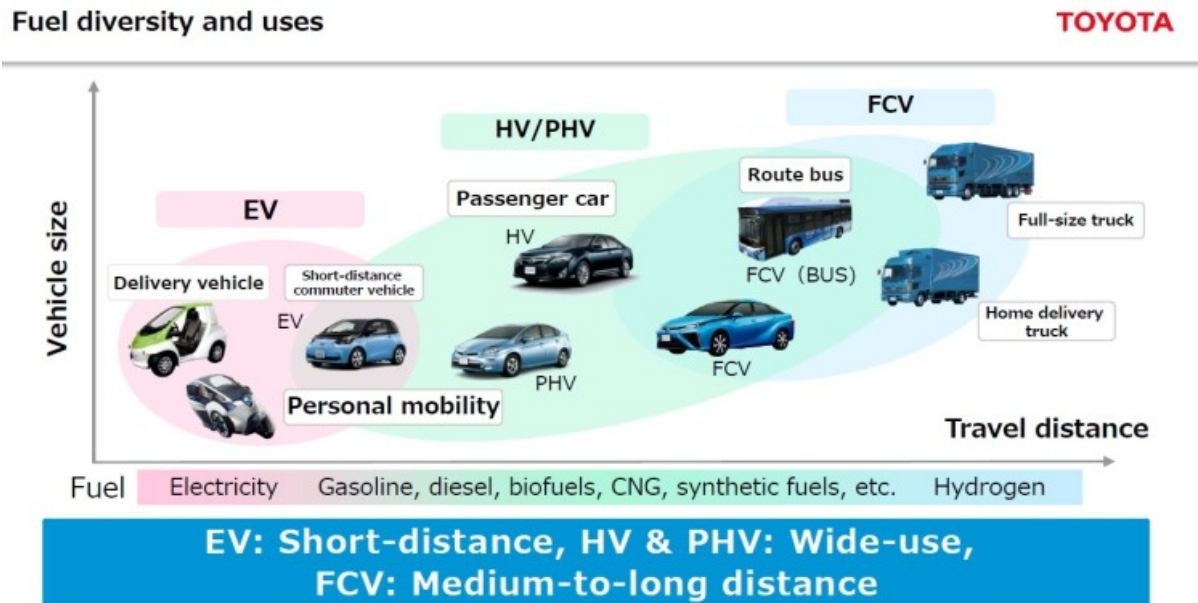
72.2.1. Reducing the upfront cost of EVs is critical for another reason – it improves the **profitability of private investments in charging infrastructure**, which creates a virtuous circle by reducing range anxiety and recharge time concerns which limit EV uptake;³⁰

²⁹ E.g. see Broadbent et al. (2017).

³⁰ Yu et al. (2016). Private investments in both EVs and recharging infrastructure confront a "chicken and egg" problem – EV buyers will wait until they know infrastructure is available, while infrastructure providers wait until they expect sufficient EV demand to warrant investing. Meade (2021) explains how customer-owned electricity distribution businesses (EDBs) – due to their owners' focus on achieving customer benefits – may have a particular role to play in accelerating recharging network rollout.

- 72.3. **Bans on sales of new ICVs** beyond certain dates, and **vehicle fleet emissions standards** – both of which the CCC has recommended; and
 - 72.4. Creating a **second-hand market** for EVs, since most car buyers do not buy new cars – **government fleet procurement**, and **business fleet procurement**, are important initiatives in this regard, but only make a small dent on the required used market size; and
 - 72.5. **Consumer information services** – e.g. as to vehicle attributes, location and status/availability of rechargers, total costs of ownership, and availability of incentives.
73. To the latter could be added **certification/standards** for reducing consumer concerns/doubts about buying used EVs with second-hand batteries, vehicle/battery recycling options, recharger access, repairs, etc:
- 73.1. More generally, **policies reducing consumer risk/uncertainty** re EV ownership could be critical – e.g. **government commitment to support rollout of chargers**, etc.
74. Consumer informational hurdles and risks include:
- 74.1. The actual “greenness” and other “ethical” features of EVs relative to ICVs – especially over each vehicle type’s full Lifecycle (including manufacturing and decommissioning/recycling);
 - 74.2. EV performance relative to ICVs – including range;
 - 74.3. Recharger access/convenience/compatibility;
 - 74.4. Battery status, management, replacement cost/ability, and end-of-life costs/benefits – especially if buying used EVs; and
 - 74.5. Total costs of ownership over the full EV lifecycle, including likely resale (of vehicles, and used batteries) – especially given rapidly evolving EV and rival clean vehicle (e.g. hydrogen fuel cell vehicle, HFCV) technologies.
75. Furthermore, it should not be forgotten that many manufacturers of ICVs are continuing to improve the fuel efficiency and cost of their existing technologies, and fuel companies will face pressure to reduce the cost of their fuels as EV uptake becomes more attractive:

Figure 3.3 – Toyota’s vision for how Different Vehicle Technologies will Serve Different Travel Needs



Source: <http://insideevs.com/toyota-to-sell-30000-hydrogen-fuel-cell-cars-annually-by-2020/>.

EV = electric vehicle (plug-in), HV = hybrid (fuel-electric) vehicle, PHV = plug-in HV,

FCV = hydrogen fuel cell vehicle (an alternative type of EV).

- 75.1. Unless and until they commit to retiring these existing technologies, the *relative* attractiveness of EVs over ICE vehicles will not increase as strongly as if only EVs were improving and ICE vehicles were staying the same – otherwise, as existing technologies get better and cheaper, this means EVs must become better and cheaper still in order to convince car buyers to switch;
- 75.2. In fact this will only be made worse as EV uptake accelerates, since this is likely to result in many more older used ICE vehicles being available in Aotearoa, depressing their prices and making them more affordable relative to EVs.
76. That said, as the relative cost of EVs falls, availability of recharging infrastructure improves, and quality of EVs rises (e.g. longer driving ranges and faster recharging times), the rate of EV uptake can be expected to accelerate, however there is still some distance to go.
77. Finally, with current EV technology at least, it is likely that EVs will be suitable for certain types of transport uses but not others – e.g. smaller passenger and delivery vehicles, and shorter trips. Figure 3.3 illustrates Toyota’s vision for what types of vehicle will be most suitable for different applications:

- 77.1. Toyota's emphasis on HFCVs for heavy loads or longer trips aligns with Japan's broader strategy to use hydrogen for a variety of transport, heating and industrial uses;³¹
- 77.2. This is potentially very important for New Zealand, since we rely heavily on importing used Japanese vehicles to update our vehicle fleet – if New Zealand's transport strategy relies heavily on EVs but our main supplier of vehicles is pursuing a different strategy then this could seriously increase the cost of and impede Aotearoa's transition to a low-emissions transport sector.

3.3 Importance of Transport to Māori

78. The CCC Report acknowledges the importance of transport. At p. 84 it states:

"Transport is crucial to our livelihoods, wellbeing and economy. It connects us to our families, allows us to participate in wider society, and ensures we can access work, education, healthcare, supermarkets, banks and local activities."

79. More particularly for Māori, at p. 85 the CCC Report acknowledges:

"Access to transport is a particular issue for some Māori. Transport is hugely important for Māori to connect to their whānau, haukāinga, and tūrangawaewae. About a quarter of Māori in Aotearoa live in Auckland. However, many have whakapapa connections outside of Auckland and may need to travel long distances to participate in iwi, hapū, and whānau activities and events. Some Māori households are large or intergenerational and require larger vehicles. Transport, particularly utes, is also a key enabler for the haukāinga to collect resources and provide services to the marae.³²

"Some people and businesses have specific transport needs the transition will need to address. Farmers, contractors and others in rural communities need vehicles that can carry heavy loads or access rugged or remote locations. Single- or double-cab utes, farm bikes and quad bikes are an essential part of farming and rural landscapes. Cost-effective and low emissions solutions for these vehicles are available now, or will be in the next few years."

80. Research into Māori transport needs stresses further issues still:³³

³¹ <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/japan-keeps-auto-industry-s-hydrogen-dreams-alive-62160857>.

³² These themes are also stressed in Raerino et al. (2013).

³³ Raerino et al. (2013).

- 80.1. “Access to employment, the major mediator between income and health, is strongly determined by car ownership in New Zealand, and lack of access to a car is a significant barrier to employment for Māori job-seekers”;³⁴
- 80.2. More generally, transport is likely to be a key support for Māori wellbeing, “enabling access to sites of importance to culture and identity”;³⁵
- 80.3. Limited access to transport is a barrier to meeting cultural obligations (such as exercising kaitiaki obligations towards ancestral lands); and
- 80.4. Māori prefer car use over public and active transport since as the most cost-effective, reliable, fast and safe way to combine economic participation (e.g. through employment) with whānau/community commitments such as visiting family or attending marae meetings.
81. According to this study, car use was viewed by Māori as offering the greatest independence and sense of control, including the ability to respond to emergencies in extended families, and to look after the travel needs not just of children but also of elders (kuia and kaumatua) with impaired mobility – especially in relation to hui and other cultural events.
82. This research also emphasises how young Māori men are especially vulnerable to being stigmatised with a criminal record due to driving or vehicle convictions:³⁶
- 82.1. Licensing requirements and costs can disadvantage Māori who have not been well-served by the education system;
- 82.2. Relatedly, the cost of driver licencing can require employment, but securing employment often hinges on having a licence;
- 82.3. Furthermore, the costs of maintaining a warranted and registered vehicle are often beyond the reach of many Māori, resulting in criminal records and diminished employment prospects as a consequence of incurring vehicle-related infringements.

³⁴ Raerino et al. (2013), p. 55.

³⁵ Raerino et al. (2013), p. 55.

³⁶ For similar research, see also Vinnell (2017).

83. In respect of decision-making and authority, this research identified that Māori feel disadvantaged in transport and community-level urban planning decision-making processes, including for public transport, with the result that transport systems poorly reflect their preferences and needs.

3.4 Significance of Transport Costs to Māori Households

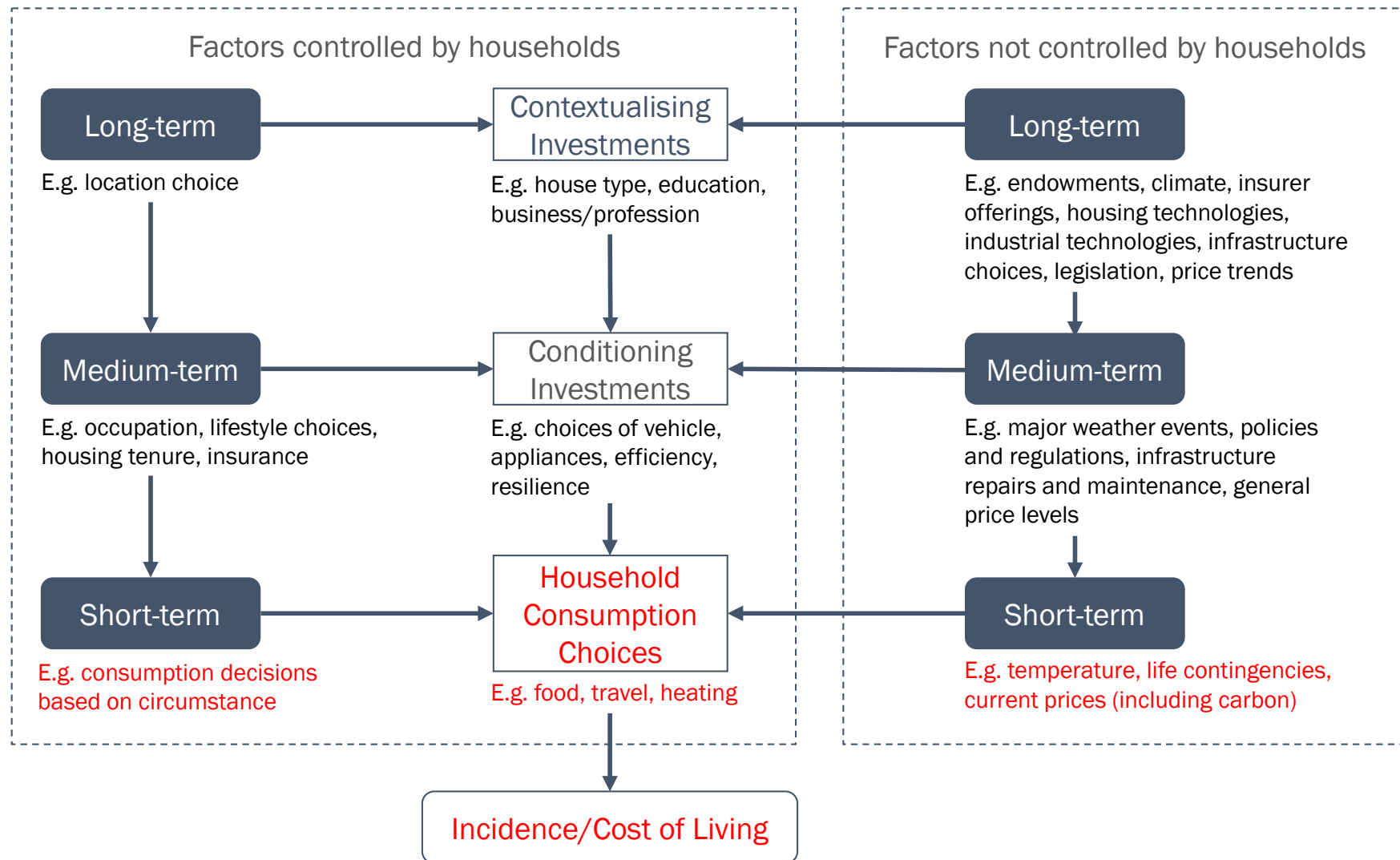
84. The CCC Report predicts that fuel prices will rise materially as a consequence of the transition to a low-emissions economy:

“Our modelling indicates petrol and diesel prices could have increased by up to 30 cents per litre in 2035 as a result of our proposed emissions budgets. Travel costs, including the cost of petrol and vehicle maintenance, are expected to increase for an average household.”

85. It suggests that the way to reduce the impact of this is to buy EVs, reduce travel, or use public or active transport.
86. Research by the Ministry of Transport (MoT) indicates that the impacts of such a price rise will depend on three factors:³⁷
- 86.1. Level of exposure – whether people own a vehicle or not;
 - 86.2. Ability to pay – whether people can afford to buy a replacement or keep using an old car; and
 - 86.3. Ability to adapt – e.g. ability to access public transport or shared transport, which is affected by demographics such as location, working shifts, disability, etc.
87. Figure 3.4 illustrates this in more detail. It helps to understand why the ability of households to reduce their exposure to a fuel price increase is limited in the short term due to decisions they have already taken regarding where they live and work, and what type of transport options (e.g. vehicle types) they have:
- 87.1. They may be able to mitigate the impacts of a fuel price increase over the medium term by changing things like their vehicle type, and over the longer term by changing where they live and work;
 - 87.2. However, if households face barriers to changing where they live and work, and in the types of transport options they have, then they might remain exposed to fuel price increases.

³⁷ MoT (2019).

Figure 3.4 – Drivers of Cost of Living over the Short-, Medium- and Long-Term



Source: Figure 3.3 of Meade (2017).

88. Research into the impact of emissions pricing on Māori households' cost of living suggests that fuel price increases like those predicted by the CCC are likely to be disproportionately borne by Māori households, increasing their cost of living:³⁸

88.1. This reflects barriers faced by Māori households in making the sorts of medium- and long-term changes needed to mitigate the impact of higher fuel prices, and also the composition of their fuel demand, as well as short-term demand drivers.

3.5 Importance of Transport to Māori Business and Employment

89. Access to low-cost, reliable and safe transport is essential for any business that relies on moving goods or people. As identified in Section 2.2, the transport sector is an important employer of Māori, which will include many Māori truck drivers (including owner-operators).

90. While EV and other low-emissions technologies are emerging for larger freight vehicles (including development of HFCV freight options), these remain relatively expensive, and the required refuelling and fuel supply infrastructure is under development.

91. Until such alternatives become more available and affordable, heavy freight transport – as well as sea and air transport – will likely remain reliant on using fossil fuels or perhaps biofuels

91.1. Even when they do become available, they might be sufficiently costly that assistance will be required to encourage their uptake at the pace the CCC recommends.

3.6 Opportunities for Māori in Transitioning to Low-Emissions Transport

92. Opportunities for Māori in low-emissions transport might include things like:

92.1. Incorporating low-emissions transport in supply chains, to underpin Māori product or service offerings that are differentiated in terms of reflecting Māori values (and hence appealing to discerning customers, capital suppliers or employees):

92.1.1. This includes as consumers of transport services, or suppliers of transport services;

³⁸ Meade (2017).

- 92.1.2. Possible examples include electric delivery vehicles for short-haul freight, electric vessels for inshore fisheries and aquaculture, and electric people movers for tourism ventures;
- 92.2. Creating community-level shared, public or active transport options that are better tailored to Māori transport needs, to substitute for private vehicle use;
- 92.3. Partnering with electricity sector providers such as electricity distribution businesses (EDBs) to develop low-cost options for supplying EV charging infrastructure in areas where existing distribution networks would be prohibitively costly to upgrade:
- 92.3.1. Possibilities include developing micro-grids using solar photovoltaic panels (PV) and/or grid-scale batteries that can be used for EV fast charging without increasing peak demands on existing distribution infrastructure – such developments being more economic at scale, and hence possibly suitable for marae and papakāinga, or on suitable marginal land.
- 92.3.2. Customer-owned EDBs might be natural parties for iwi and other Māori collectives to partner with, given their shared long-term commitment to serve particular communities of people;³⁹
- 92.3.3. Alternatively, these developments might involve public-private partnerships (PPPs) between central or local government and local Māori;
- 92.4. Exploring possibilities such as EV repairs and maintenance, or refurbishing or recycling used EV batteries; and
- 92.5. Participating in the development of clean hydrogen production, and rollout of refuelling infrastructure for heavy road vehicles, and ultimately passenger vehicles – especially for iwi or other Māori collectives with access to geothermal

³⁹ The possible role of customer-owned EDBs in accelerating the uptake of distributed energy resources (DERs) like PV, batteries and EVs is discussed in detail in Meade (2021).

resources,⁴⁰ or with recognised foreshore and seabed interests (in relation to possible offshore wind generation or floating solar array developments).

What Policies or Other Support Measures Might be Required?

93. In general terms, for Māori enterprises to be able to successfully differentiate their offerings by embedding Māori values, so as to secure pricing premiums, there may be need for:
- 93.1. Certification, standards and monitoring/reporting schemes to verify to customers, capital suppliers and employees that the relevant Māori values are being complied with;⁴¹ and
 - 93.2. Intellectual property rights (IPR) protections for Māori values and mātauranga Māori, so that they cannot easily be imitated.
94. While certification, standards and monitoring/reporting schemes are likely to need to be independent, Māori would have a key role in their design and governance, for which support may be necessary:
- 94.1. Likewise, IPR development will likely require non-Māori participation, but Māori would have a key role in its design and governance, with support from government.
95. Creating community-level shared, public or active transport options would require cooperation between central or local government and local Māori, including through greater partnership being provided for in legislation to replace the Resource Management Act (RMA).
96. For iwi and other Māori collectives to partner with EDBs for the development of micro-grids involving distributed energy resources (DERs) like PV, batteries and EVs,⁴² this may require

⁴⁰ Tuaropaki Trust is an active example. If and when Māori rights and interests in freshwater (including geothermal water) – are recognised, such as through current RMA reforms, further such possibilities might become available to Māori more widely.

⁴¹ Issues of cultural authenticity/appropriation and the cultural equivalent of “greenwashing” loom large, as do the supplier and consumer costs of having multiple standards and certification schemes. For example, see Baltus (2019), Economist (2021), or the recently-announced EU Green Bond Standard.

⁴² EVs can form part of micro-grids if they include vehicle-to-grid (V2G) technology, meaning they can discharge electricity into networks as well as store energy from networks. This highlights how PV, batteries and EVs (especially those with V2G capability) will increasingly constitute a new form of electricity ecosystem.

relaxation of Part 3 of the Electricity Act in appropriate circumstances, which currently limits the extent to which EDBs are permitted to invest in activities like generation.⁴³

97. Exploring possibilities such as EV repairs and maintenance, or refurbishing or recycling used EV batteries is likely to require R&D funding as well as start-up development funding, and will likely ultimately require large scale to be economic:

97.1. Government funding in early development stages is likely to be required.

98. Finally, Māori participation in hydrogen production developments might hinge on better recognition of Māori freshwater rights and interests (for hydrogen production based on geothermal generation as well as access to freshwater) or foreshore and seabed interests (for production based on offshore wind generation, or floating solar arrays):

98.1. Since such developments will also hinge on R&D and early-stage commercialisation, government funding may be important to support them in these early stages (e.g. in the rollout of refuelling infrastructure);

98.2. Policies mandating or supporting hydrogen for particular uses might also assist with the uptake of such developments by reducing strategic uncertainty about which technologies will be adopted for those uses.⁴⁴

3.7 Risks/Barriers for Māori in Transitioning to Low-Emissions Transport

Inability of Many Māori to Afford EVs

99. At p. 85 the CCC Report acknowledges that many Māori will likely face barriers in adopting EVs, and remain reliant on private vehicles for transport needs:⁴⁵

⁴³ Relaxing Part 3 rules is discussed further in Meade (2018) and Meade (2021).

⁴⁴ To the extent that heavy vehicle transport and (long-distance) aviation are likely to rely on technologies like hydrogen to achieve lower emissions, this implies that such technologies will be adopted regardless of how much EV uptake occurs for light/passenger vehicles. As such, this raises the prospect of HFCVs also becoming dominant even for light/passenger vehicles, increasing the risk that parties investing in EVs potentially finding themselves stranded in an inferior technology. If Māori are more likely to be late adopters of EVs for any reason (e.g. their unaffordability in the foreseeable future), this might ironically mean Māori could be more likely to avoid such stranding, and leapfrog EVs by instead adopting HFCVs as they become more available and affordable. While this reduces stranding risk, affected Māori may still be disadvantaged in the interim by being locked in to ageing ICE vehicles.

⁴⁵ This means that many Māori are likely to experience “transport vulnerability” (Vinnell (2017)), or “transport disadvantage” (Raerino et al. (2013)).

“[L]ower income and rental households may be less able to afford electric vehicle than wealthier households due to the upfront cost of electric vehicles. It may also be challenging for those who cannot charge an electric vehicle at home, for example people living in apartments... [this] is particularly relevant for people with disabilities who often rely on a vehicle to get around, and for some Māori households who are disproportionately represented among those with low incomes.

Increased Cost of Living, Lock-In to ICE Vehicles, and Associated Adverse Consequences

100. Based on the research discussed in Section 3.4, absent suitable support measures this means Māori households that are unable to replace their ICE vehicles – which are essential for work, whānau and cultural purposes – will face higher living costs through increased fuel prices:

100.1. They will also potentially find themselves locked in – “ghettoised” – in aging ICE vehicles – at a time when other New Zealanders will be accessing newer, safer low-emissions vehicles;

100.2. This is especially if no new ICE vehicles will be able to be imported from 2035 or sooner, and if public or active transport, or home working, are not feasible options:⁴⁶

100.2.1. Home working, in particular is most suitable for skilled occupations, so Māori in less-skilled occupations will unlikely be able to reduce their travel demand by working from home.

101. Such lock-in could have multiple adverse consequences such as:⁴⁷

101.1. Rising maintenance and repair costs – increasing cost of even living further;

101.2. Declining vehicle reliability – with possible adverse implications for employment, and timely access to education and healthcare;

⁴⁶ While having such a “soft sunset clause” may induce greater EV uptake, it might also simply lock in many vehicle owners to increasingly inefficient and expensive to maintain ICE vehicles (without substantial targeted support in place to improve the relative attractiveness of EVs). Ironically, vehicle fleet emissions might in fact be lower absent such a clause, since in that case car buyers can continue purchasing newer generations of increasingly fuel-efficient ICE vehicles and retire their old ones while EVs become more affordable, attractive, and viable (e.g. via recharging infrastructure access).

⁴⁷ MoT (2019), Raerino et al. (2013), Vinnell (2017).

- 101.3. Declining vehicle safety – potentially exacerbating the already disproportionate accident and death rate experienced by Māori;⁴⁸
 - 101.4. Increasing vehicle emissions as older ICE vehicles become less efficient as they age (with associated cultural costs, especially if Māori become disproportionate owners of old ICE vehicles); and
 - 101.5. Increased risk of securing a criminal record for failing to ensure ongoing vehicle registration and warrantability.
102. Research by MoT highlights particular sub-groups of Māori who are most likely to be so exposed:⁴⁹
- 102.1. They especially include single-parent, low-income families with many children, using large but cheap vehicles (e.g. vans), living either in rural areas, or on the outskirts of major cities where public transport is infrequent or non-existent (e.g. at night time, for night shift workers).

Potentially Regressive EV Subsidies

103. Other potential equity impacts of transitioning to EVs include transfers to those able to afford new vehicles, who tend to be more affluent:
- 103.1. Overseas research on the impacts of subsidies for low-emissions vehicles and financial penalties for buyers of high-emissions vehicles finds them to favour middle- or high-income households.⁵⁰

Waterbed Effects

104. Existing research has found that the adoption of new technologies by more affluent consumers can result in costs being shifted to less-affluent consumers – so-called cost-shifting, or waterbed effects:
- 104.1. This has particularly been observed in electricity systems when affluent households adopt PV generation, meaning they contribute less towards the fixed costs of

⁴⁸ Raerino et al. (2013), and Vinnell (2017).

⁴⁹ MoT (2019).

⁵⁰ Durrmeyer (2020), Stitzing (2016).

electricity distribution networks (with those costs increasingly falling on other households);⁵¹

104.2. However, the extent of such waterbed effects is reduced if such households also adopt EVs.⁵²

105. Waterbed effects can also arise in relation to EV uptake:

105.1. Research suggests that subsidies or charges to induce the uptake of low-emissions vehicles (of the sort the CCC suggests could be necessary) – in a socially-beneficial way – need to be predominantly a charge on higher-emitting vehicles:⁵³

105.1.1. This could be particularly regressive for Māori, involving increased vehicle purchase costs;

105.2. Furthermore, with current roading funding coming from road user charges on diesel vehicles and fuel excise duties for light passenger and other petrol vehicles, EV purchasers might be able to reduce their contributions to road funding if they pay neither, leaving the cost to fall on ICE vehicle users – absent a suitable rebalancing of how roads are funded.

Vehicles with Limited Alternatives to Fossil Fuels

106. The CCC Report acknowledges that certain types of vehicle, such as larger trucks, utes and other farm vehicles, are unlikely to have low-cost electric alternatives for some time:

106.1. This is also true of shipping and aviation, where electric vessels are already available for shorter and lighter voyages, but longer and heavier voyages currently have no electric substitute (except, perhaps, for emerging HFCV alternatives).

107. To the extent that Māori organisations remain reliant on such vehicles (such as utes for farming, and fishing vessels reliant on fossil fuels), the CCC's predicted rising cost of fossil fuels could result in reduced competitiveness, especially if rival producers in export markets do not face equivalent costs.

⁵¹ Boampong and Brown (2020).

⁵² Hoarau and Perez (2019).

⁵³ Adamou et al. (2014).

Possible Cultural Concerns Associated with EVs

108. EVs can have very low emissions from operation, depending on the extent to which the electricity they rely on is produced renewably. However, they can also have higher lifetime emissions than other low-emissions vehicles (e.g. hybrids) because of the additional emissions arising from the production of EV batteries and rechargers.⁵⁴
- 108.1. Additionally, some of the materials used to produce EV batteries are mined in ways raising sustainability concerns, and in developing countries where labour practices raise ethical concerns;
- 108.2. Moreover, as acknowledged by the CCC, end-of-life EV batteries can be highly polluting and a fire risk if not disposed of properly.
109. These considerations point to Māori potentially having cultural concerns regarding the sustainability, ethics, and lifetime environmental impacts of EVs (especially their batteries).

What Policies or Other Support Measures Might be Required?

110. As indicated by the CCC, proactive targeted support measures will be critical if low-income, disabled and/or non-urban Māori are to be able to uptake EVs at a rate comparable to that of other Māori and non-Māori:
- 110.1. This is likely to mean substantial and more generous support measures for these groups than are offered to other parties to accelerate the transition to low-emissions transport – recognising the potentially regressive nature of low-emissions vehicle support measures:
- 110.1.1. Lessons should be learned from the designs of similar “feebate” or “bonus-malus” schemes used elsewhere;⁵⁵
- 110.2. They will need to include complementary support measures such as access to charging infrastructure – including to renters, and non-urban households and businesses.

⁵⁴ E.g. see Ahmadi et al. (2018), or Ellingsen et al. (2016).

⁵⁵ E.g. Durrmeyer (2020), Durrmeyer and Samano (2018), Stitzing (2016), Adamou et al. (2014).

111. Support for such groups may also be required to offset the impact of increased fuel costs for those who remain unable to switch to EVs, to the extent this is not achieved through indexation of welfare transfers.
112. A careful rebalancing of how road funding is achieved – from road user charges and fuel excise duties – will be required to avoid road funding costs being shifted onto Māori who are unable to switch to EVs:
- 112.1. Attention will also be needed to the possible adverse consequences of low-income and younger Māori especially being locked in to ICE vehicles (including greater risk of criminal prosecution for maintaining unwarranted or unregistered vehicles).
113. Increased funding and Māori participation in the design and governance of community transport, public transport, and active transport – including its integration with urban design and planning – is also likely to be important:
- 113.1. This would need to complement greater partnership between iwi and other local Māori collectives and either central or local government, such as through the current RMA reform process;
- 113.2. It would also need to complement other direct support for the use of public transport by Māori, such as through targeted subsidies or user discounts, or even just methods for smoothing payments for season passes to avoid their higher upfront cost being a hurdle to accessing lower per-trip costs.⁵⁶

Key questions to consider in relation to this section:

1. Given your travel needs, do you think EVs would be suitable alternatives to ICE vehicles?
2. What are the main barriers you face in working from home, or in switching from private vehicle use to public transport or active transport (walking, cycling, etc)?
3. What are the most significant barriers you face in purchasing EVs? Could you afford a new or used EV, and would you be able to have a charger connection where you live or work?
4. What sort of support measure(s) would best overcome these barriers?

⁵⁶ Bondemark et al. (2020).

5. Would you be prepared to pay higher electricity lines charges as part of your power bill to pay for the rollout of extra electricity distribution capacity to allow widespread EV charger rollout?
6. If there is a ban on imports of new ICE vehicles in the near future, and perhaps taxes on vehicles with higher emissions accompanied by subsidies or rebates on EVs, will you buy an EV, switch to public/active transport, or just keep using your existing ICE vehicle for longer?
7. What cultural costs do you foresee if Māori are disproportionately locked in to using ageing ICE vehicles? Or from the sustainability, ethical and environmental impacts of EV batteries? What might be required to mitigate such cultural costs?
8. What opportunities can you see for your business in adopting low-emissions transport in your supply chains? Will it make a positive difference to your bottom line?
9. What potential is there for you to participate in the development of better community-level shared, public or active transport?
10. What need and opportunity do you see for partnerships in your area for co-developing EV charging infrastructure, including via micro-grids?
11. Do you foresee opportunities for Māori involvement in EV repairs and maintenance, and end-of-life activities like battery refurbishment and recycling?
12. Can you see any opportunity in participating in the development of clean hydrogen production, and rollout of hydrogen refuelling infrastructure?
13. What policies or other measures would be critical for you to secure any of these opportunities?

4. Electricity and Non-Industrial Heating

Key points from this section:

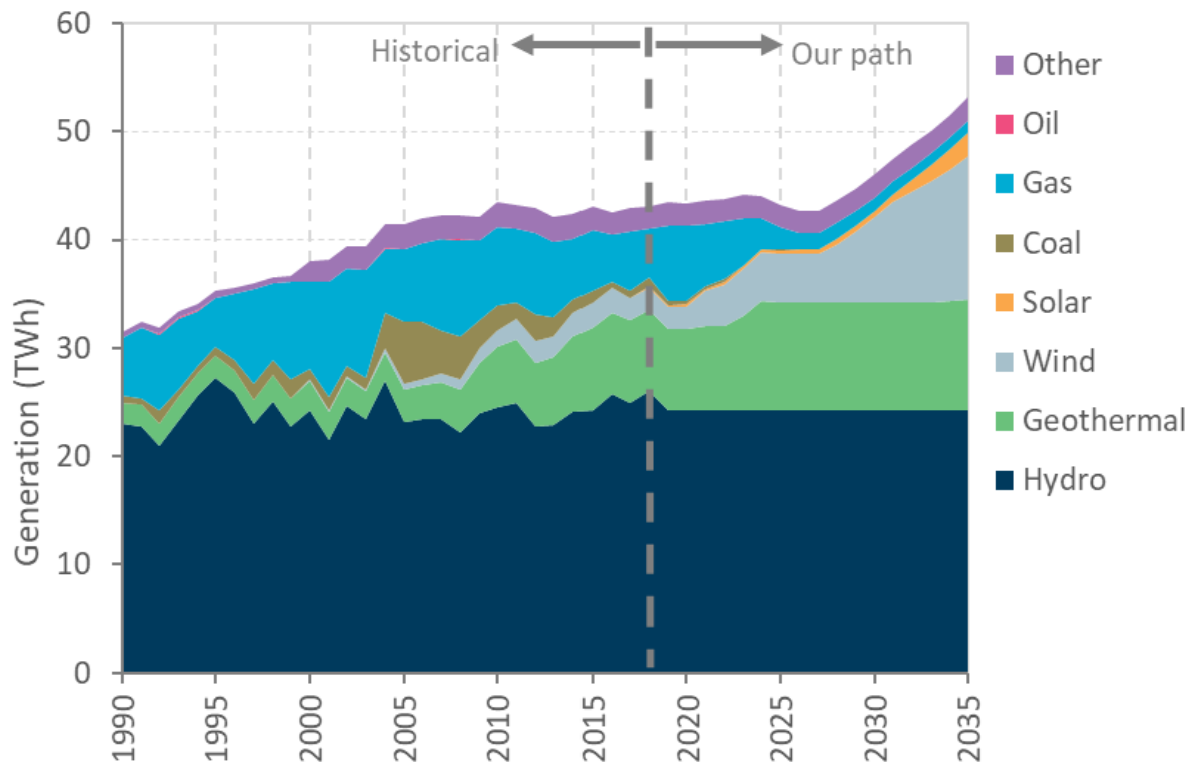
1. The CCC is recommending that homes and buildings be better insulated, and that inefficient or gas heating for homes and other non-industrial buildings be replaced with efficient electric heating:
 - a. It is also recommending that gas and coal generation – as well as geothermal generation with high emissions – be retired, with increased wind and solar generation.
2. Low-income and renting Māori, marae, papakāinga, and Māori social housing all face barriers to improving home and building insulation, switching to energy-efficient heating, and bearing any increase in ongoing heating costs where higher-emissions alternatives are cheaper to buy and operate.
3. Possible opportunities for Māori in transitioning to low-emissions electricity and non-industrial heating include:
 - a. Investments in renewable electricity generation – especially geothermal, and offshore wind, solar and tidal;
 - b. Possible hydrogen production;
 - c. Building energy efficiency assessments, and retrofitting buildings with insulation and efficient low-emissions heating; and
 - d. Sustainability branding as part of wider Māori values branding.

4.1 What the CCC is Recommending

114. As summarised in Section 1.3, the CCC is recommending:

- 114.1. Improved insulation for homes and other buildings to reduce space and water heating demand, and the ultimate retirement of gas heating for such buildings;
- 114.2. The near-complete retirement of all coal and gas electricity generation, as well as certain high-emissions geothermal generation; and
- 114.3. An expansion of wind and solar generation to meet rising demand for electricity for EVs and other demand growth (e.g. for heating).

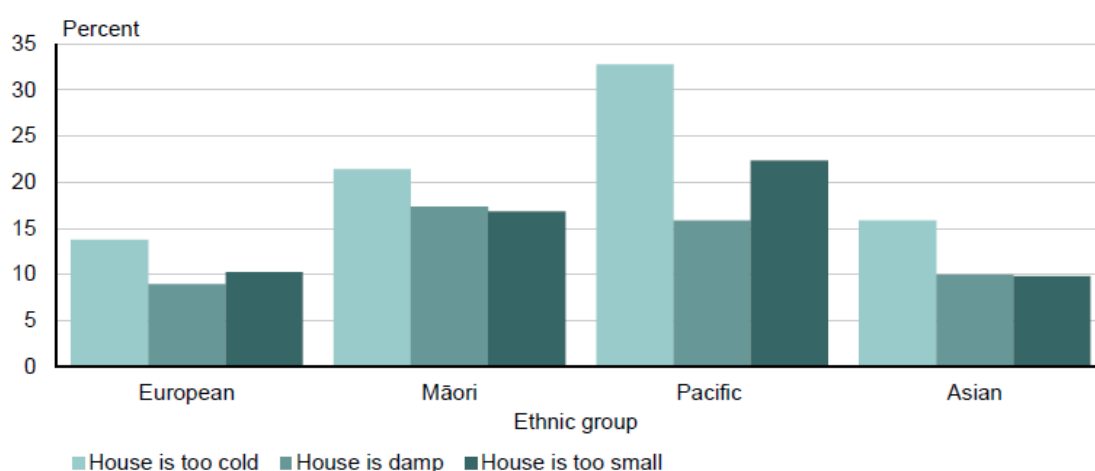
Figure 4.1 – CCC's Recommended Change in Electricity Generation Mix to 2035



Source: Figure 3.13 of the CCC Report.

115. Figure 4.1 illustrates the change in electricity generation the CCC is envisaging by 2035.
116. The CCC's modelling assumes closure of the aluminium smelter at Tiwai Point, which reduces pressure on electricity prices in the near-term:
 - 116.1. The CCC predicts lower household energy bills, especially if they adopt energy-efficient technologies like heat pumps; and
 - 116.2. However, the CCC acknowledges that not all households will be able to afford such technologies, or might be unable to adopt them due to renting rather than owning their homes (with landlords potentially being unable to recover the costs of insulation and efficient heating), meaning they might face increased energy costs.
117. Conversely, the CCC expects that household gas bills could increase by around \$150 per annum under its proposed carbon budgets:
 - 117.1. However, it also acknowledges that there is significant uncertainty regarding the path of future electricity and gas prices, and that some households will face higher energy price rises than others, including depending on where they are located;

Figure 4.2 – Self-Reported Housing Problems by Ethnic Group



Source: Statistics New Zealand (2013).

117.2. It is unclear whether this assessment allows for the rollout of hydrogen supplies as an alternative to reticulated natural gas or LPG supplies.

118. As for the transition to low-emissions transport, the CCC anticipates that support measures will be required, especially for households exposed to increasing electricity and gas costs, and those which are unable to switch to lower-emissions alternatives, with uncertainty as to how those costs are likely to change with the transition to low-emissions electricity and non-industrial heating.

4.2 Importance to Māori of Non-Industrial Heating

119. As shown in Figure 4.2, Māori households are relatively more likely to report their accommodation as being too cold or damp, implying a need for better heating and insulation:

119.1. Poor housing conditions tend to be associated with higher disease burden, such as respiratory diseases.

120. Hence, mention should be made of how measures to reduce emissions might contribute to increased disease burden in Māori households, as well as increased cost of living:

120.1. With Māori households being more likely to live in rented accommodation, and less likely to make discretionary expenditures on electricity for heating (and relatively less able to afford efficient heating investments), they are relatively more likely to face disease burden from cold and damp accommodation.

121. If Māori households are relatively price-insensitive regarding expenditures on motor fuels and electricity, measures to reduce emissions are likely to increase Māori households' (relatively non-discretionary) expenditures on these items:
- 121.1. This leaves less income available for discretionary items such as medical bills, while potentially requiring greater such expenditures, relative to non-Māori households, due to higher relative disease burden;
- 121.2. This higher burden and associated costs – as well as lost education and work opportunities due to poor health – are additional potential impacts of emissions pricing and measures to reduce emissions that are disproportionately borne by Māori households.
122. The phasing out of LPG heaters, which the CCC acknowledges are important heating sources in the East Coast and Far North could be particularly harmful for Māori in these areas:⁵⁷
- 122.1. As discussed in Section 2.3, both of these areas have relatively high Māori population shares, as well as high socio-economic deprivation;
- 122.2. Unless affordable substitutes become available, or targeted support is made available, Māori in these areas might experience even worse health outcomes, and associated education and employment outcomes, than they do presently.
123. Heating is also likely to be important for marae and papakāinga, and also a significant cost in each case:
- 123.1. It is also likely to be significant for other community infrastructure contributing to Māori wellbeing, including schools, hospitals, rest-homes, and clubs/community centres.
124. The government has already made support available for converting publicly-owned facilities such as schools and hospitals to low-emissions heating:
- 124.1. However, it remains to be seen whether that support is sufficient, and whether support will also be made available for increased ongoing operating costs from

⁵⁷ That is, unless affordable substitutes such as bottled hydrogen become available, as well as suitable hydrogen-capable heaters.

using low-emissions alternatives like electricity, or biomass in regions where it is available (i.e. near major wood processing regions);

124.2. If schools and hospitals must bear these increased operating costs, then absent additional operational funding this could result in reduced service levels.

125. Non-publicly owned entities such as marae, papakāinga, private rest-homes and clubs and other community facilities currently enjoy neither support for converting to low-emissions heating, nor for increased ongoing operating costs from switching away from coal or gas:

125.1. The phase-out of coal and gas heating (and other fossil fuel heating such as oil heaters) could significantly increase the operating costs of such entities, placing pressure on the services they can provide Māori and other community members;

125.2. Alternatively, if they remain locked in to existing heating types, they face the risk of increased fuel costs, as well as possibly declining heater safety.

4.3 Significance of Non-Transport Energy Costs to Māori Households

126. Research into the impact of emissions pricing on Māori households' cost of living suggests that gas price increases like those predicted by the CCC, and possible electricity price increases, are likely to be disproportionately borne by Māori households, increasing their cost of living:⁵⁸

126.1. As for motor fuel prices, this reflects barriers faced by Māori households in making the sorts of medium- and long-term changes needed to mitigate the impact of higher electricity and gas prices, and also the composition of their electricity and gas demand.

4.4 Importance of Electricity and Non-Industrial Heating to Māori Business

127. The cost of converting to low-emissions heating for Māori businesses, and any associated increase in ongoing operating costs if low-emissions heating is more expensive to run, may prove to be a competitive disadvantage to businesses operating in markets where consumers do not adequately value sustainability:

⁵⁸ Meade (2017).

127.1. Conversely, as discussed in Section 3.6 in relation to low-emissions transport, for Māori businesses operating in markets with discerning consumers, capital suppliers and employees, adopting low-emissions heating may provide a sustainable competitive advantage, underpinned by wider Māori values.

4.5 Opportunities for Māori in Transitioning to Low-Emissions Electricity and Non-Industrial Heating

Māori Investments in Renewable Electricity Generation

128. Possibilities for Māori investments in renewable generation include geothermal, onshore or offshore wind, tidal, and onshore or offshore (e.g. floating) solar:

128.1. Geothermal options are obviously greatest for Māori with access to geothermal resources, which access might be improved through greater recognition of Māori freshwater rights and interests (e.g. via the current RMA reform process);

128.2. Offshore wind and solar options, and tidal options, are enhanced where Māori have recognised foreshore and seabed rights (e.g. via the Marine and Coastal Area Act).⁵⁹

129. Such investments might be undertaken alone by iwi or Māori collectives, or perhaps by way of joint venture or PPP (e.g. with existing local or overseas electricity sector companies):

129.1. As well as offering advantages in terms of sustainability, such ventures might also benefit from embedding Māori values (e.g. enabling better access to capital from investors concerned about social impact as well as sustainability).

130. Collective/community micro-grid schemes with PV and grid-scale batteries (and EVs with V2G capability) – such as at marae, papakāinga and social housing schemes might also be particular opportunities for iwi and other Māori collectives, and Māori social housing providers:

⁵⁹ Offshore wind and tidal possibilities might also be enhanced if Māori are able to access UK expertise in these areas, such as via a free trade agreement between Aotearoa and the UK – Meade and Rice (2021).

130.1. As mentioned earlier, customer-owned EDBs might be natural partners in such schemes, given their shared commitment to serving defined local populations;⁶⁰

130.2. However, other iwi or Māori collectives, or “impact investors” concerned with things like sustainability and community development, could also be natural partners.

Possible Hydrogen Production

131. Where Māori are able to enter into renewable electricity supply, this not only offers possible co-benefits in terms of EV uptake in areas otherwise underserved with charging infrastructure (as discussed in Section 3.6):

131.1. It also offers the possibility of entering into renewable hydrogen production and storage, which could assist with local home heating (replacing natural gas or LPG, or even electric heating), as well as the possible rollout of refuelling infrastructure for HFCVs (with benefits over EVs in terms of driving range and refuelling times).

Building Energy Efficiency Assessments, and Retrofitting Buildings with Insulation and Efficient Low-Emissions Heating

132. The CCC’s recommendations present the huge challenge of improving Aotearoa’s existing private and public/private rental housing stock so that it is easier and more efficient to heat up to healthy levels.

133. This raises potential opportunities for Māori providers of services – especially for Māori customers – like:

133.1. Building efficiency assessments, advice/information and ratings (e.g. building WoFs);

133.2. Supply, installation and servicing of home and other building energy management systems; and

133.3. Supply, installation and servicing of sustainable insulation solutions (e.g. using natural fibre), as well as efficient heating solutions (e.g. heat pumps, or hydrogen gas appliances).

⁶⁰ Meade (2021).

134. One possibility is for these services might be bundled into offerings by Māori social housing providers.

Sustainability Branding as Part of Wider Māori Values Branding

135. As in Section 3.6 for low-emissions transport, Māori businesses might be able to enjoy a sustainable branding advantage by participating in low-emissions electricity and/or hydrogen supply, and through reducing their heating-related emissions (through greater use of insulation, and energy-efficient buildings and heating).

What Policies or Other Support Measures Might be Required?

136. Assisting Māori into renewables generation and/or hydrogen production may require better recognition of Māori freshwater rights and interests (e.g. under RMA reforms), or foreshore and seabed interests (e.g. under Marine and Coastal Area (Takutai Moana) Act (MACA) processes):

136.1. Assistance to complete processes for recognising such rights will be key to expediting their recognition in order to meet the CCC's goals;

136.2. Since such developments will also hinge on R&D and early-stage commercialisation, government funding may be important to support them in these early stages;

136.3. Policies mandating or supporting hydrogen for particular uses might also assist with the uptake of such developments by reducing strategic uncertainty about which technologies will be adopted for those uses.

137. Given the risk-aversion of many Māori asset owners (e.g. due to a desire to avoid future generations being denied access to resources) as well as their potentially greater need for socio-economic development, there may need to be special measures to assure capital access for capital-intensive investments such as in large-scale renewables generation:

137.1. One possibility might be government guarantees for Māori investors borrowing from private lenders;

137.2. Another might be funding quotas' and/or preferential lending from government investment funds (e.g. for supporting the transition to a low-emissions economy, infrastructure funding, etc).

138. Building energy efficiency assessments, and retrofitting homes and other buildings with insulation and efficient low-emissions heating will require a skilled Māori workforce, with specific training in areas like:

138.1. Building and environmental science;

138.2. Electrical and gas engineering;⁶¹ and

138.3. Trades like building, electrical and gas apprenticeships.

139. The CCC Report (p. 98) acknowledges that to date Aotearoa's education, science and training systems have not well served Māori needs, and there is an urgent need for improved training systems designed, governed and provided by Māori:

139.1. Improving and scaling up programmes to assist young Māori – and older Māori in need of retraining – into apprenticeships, and STEM subjects (science, technology, engineering and mathematics), will be key.

140. The development of suitable standards and certification of home energy efficiency assessments and ratings – tailored by Māori to reflect Māori needs in different environments (homes, marae, papakāinga, social housing, etc) – will also be key:

140.1. As for education and training, support to Māori for the development of such standards and certification will likely be needed to ensure the CCC's urgent goals can be achieved.

141. For iwi and other Māori collectives to partner with EDBs for the development of micro-grids involving DERs like PV, batteries and EVs,⁶² this may require relaxation of Part 3 of the Electricity Act in appropriate circumstances, which currently limits the extent to which EDBs are permitted to invest in activities like generation.⁶³

⁶¹ Ensuring that oil and gas industry skills are not lost to Aotearoa by the oil and gas industry workforce transferring overseas as natural gas exploration and production is scaled back could be key to ensuring such skills are available to be passed on to trainees.

⁶² EVs can form part of micro-grids if they include vehicle-to-grid (V2G) technology, meaning they can discharge electricity into networks as well as store energy from networks. This highlights how PV, batteries and EVs (especially those with V2G capability) will increasingly constitute a new form of electricity ecosystem.

⁶³ Relaxing Part 3 rules is discussed further in Meade (2018) and Meade (2021).

142. Finally, in general terms, for Māori enterprises to be able to successfully differentiate their offerings by embedding Māori values, so as to secure pricing premiums, there may be need for:

142.1. Certification, standards and monitoring/reporting schemes to verify to customers, capital suppliers and employees that the relevant Māori values are being complied with; and

142.2. Intellectual property rights (IPR) protections for Māori values and mātauranga Māori, so that they cannot easily be imitated.

143. While certification, standards and monitoring/reporting schemes are likely to need to be independent, Māori would have a key role in their design and governance, for which support may be necessary:

143.1. Likewise, IPR development will likely require non-Māori participation, but Māori would have a key role in its design and governance, with support from government.

4.6 Risks/Barriers for Māori in Transitioning to Low-Emissions Electricity and Non-Industrial Home Heating

144. The CCC Report recognises that some Māori will not be in a position to adopt efficient low-emissions heating systems, despite standing to gain in terms of health and quality of life by having warmer, better-insulated homes, and hence that targeted assistance will be required for these groups. For example, at p. 83:

“Lower income households, some Māori and Pasifika households, elderly and people with disabilities will benefit more from making energy efficiency improvements. These groups are more likely to live in older, poorly insulated homes, and would therefore benefit more from cost savings, or improved health from being able to use savings for additional heating.”

“Assistance will be needed to help those on lower incomes with the upfront cost for energy efficiency improvements.

“The Government’s Warmer Kiwi Homes programme continues to provide funding to those on low incomes who own their own home to install insulation or more efficient heating. The Government has also introduced healthy home standards for rental homes that include standards for insulation and heating.

“Continued intervention will be needed to ensure that lower income households can access these benefits. The Government will need to assess whether the existing programmes are delivering at an appropriate pace and scale, and in particular consider whether these programmes have any impact more broadly on rental prices and affordability.”

145. Likewise, at p. 84 in relation to gas:

“As part of the transition, the Government will need to pay particular attention to low income households who use natural gas, who may not have the money for the upfront conversion cost, or who may rent homes with natural gas appliances or heating. Landlords that own properties with natural gas may not have any incentive to replace them with lower emissions options and therefore low cost options, as they would not benefit from the savings in running cost. There may be some efficiencies and cost savings from replacing old gas heating systems with modern electric systems.

Portable gas heaters are still used by some households in Aotearoa. They are used proportionately more in the North Island, particularly in Gisborne and Northland. These heaters tend to be used by lower income households due to the low upfront cost and the ease of budgeting for heating bills. However, they contribute to mouldy homes and cause health problems. Although the number of these heaters is decreasing, replacing them with more efficient low emissions options will take continued government support.”

146. Māori households typically have lower incomes and net worth – and are more likely to be renting – than non-Māori households:

146.1. This means, absent suitable support, they will typically face greater barriers than non-Māori households in adopting energy efficiency appliances (such as heat pumps) even when they own their homes and can directly enjoy the benefits;⁶⁴

146.2. New Zealand research indicates that tenants may not be prepared (or able) to pay landlords for the cost of heat pumps,⁶⁵ reflecting wider research findings that renters who cannot install efficient technologies for themselves are likely to miss out on those technologies because landlords are unable to recover the cost of installing them;⁶⁶

⁶⁴ Research by Grimes et al. (2011) suggests that whether or not households with retrofitted insulation and heat pumps make energy bill savings, or pay more for a better level of heating, depend on where in New Zealand they reside, due to climate variations by region.

⁶⁵ Gibson et al. (2017)

⁶⁶ Meade (2017).

- 146.3. As a consequence, absent suitable support, Māori households are at greater risk of facing an increased cost of living due to being locked in to inefficient housing and heating, or ongoing deficits in home quality and comfort, relative to non-Māori households.⁶⁷
147. An additional risk is that Māori households face waterbed effects in relation to electricity costs, as they do in relation to vehicle costs (as discussed in Section 3.7). In this context it is due to low-income or renting households facing barriers in adopting new DER technologies like PV and batteries (including EVs with V2G capacity):
- 147.1. This means higher-income households that adopt such technologies may be in a position to reduce their contribution towards the fixed costs of maintaining electricity distribution network capacity, with the result that those costs are increasingly borne by the less-affluent households who remain reliant on those networks⁶⁸ – as discussed in Section 3.7, this cost-shifting is reduced if more-affluent households also adopt EVs.⁶⁹
148. A possible solution is the development of shared or community renewables schemes (e.g. “community solar”), enabling low-income or renting households to also participate in such new technologies.⁷⁰
149. Finally, existing or prospective Māori geothermal investors/developers may face barriers in developing their geothermal interests as a consequence of tighter limits or higher charges for associated GHG emissions:
- 149.1. This could come at a time when Māori geothermal rights and interests are only just being recognised (e.g. through RMA reforms), and penalise Māori for not having been able to develop those interests sooner (e.g. through emissions rights being grandparented to others).

What Policies or Other Support Measures Might be Required?

150. Foremost is the need for proactive targeted financial support to low-income and renting Māori households, as well as marae, papakāinga and social housing to enable their uptake of building insulation and low-emissions, energy-efficient heating options:

⁶⁷ Meade (2017).

⁶⁸ Boampong and Brown (2020).

⁶⁹ Hoarau and Perez (2019).

⁷⁰ Meade (2021) discusses possible approaches for achieving such community schemes in Aotearoa.

- 150.1. Ongoing support may also be required where adopting low-emissions heating involves higher running costs than existing higher-emissions options (e.g. LPG users especially);
- 150.2. Such ongoing support is also likely to be required where public or private sector rents rise as a consequence of warm home standards increasing rental stock quality (without offsetting gains in heating costs or quality).
151. Supporting iwi, other Māori collective and Māori social housing providers to make the required assessments of Māori housing needs, and identifying cost-effective solutions and ongoing support requirements will likely be effective in ensuring solutions best meet needs.
152. Building WoFs or efficiency calculators may be needed to specifically estimate costs of maintaining a reference minimum temperature in main inhabited areas throughout the year, so that landlords or house sellers are better able to capture the value of any insulation or energy efficiency investments they make – recognising regional variations in climate and energy costs:
- 152.1. Existing warm home standards should be assessed for the appropriateness in terms of meeting Māori needs as well as the CCC's recommended goals.
153. For iwi and other Māori collectives to partner with EDBs for the development of micro-grids involving distributed energy resources (DERs) like PV, batteries and EVs,⁷¹ this may require relaxation of Part 3 of the Electricity Act in appropriate circumstances, which currently limits the extent to which EDBs are permitted to invest in activities like generation.⁷²
154. Finally, consideration may be necessary to some form of emissions rights quota for Māori geothermal developers to ensure they are able to develop their interests to the same level enjoyed by others who did not face the same barriers to geothermal development.

⁷¹ EVs can form part of micro-grids if they include vehicle-to-grid (V2G) technology, meaning they can discharge electricity into networks as well as store energy from networks. This highlights how PV, batteries and EVs (especially those with V2G capability) will increasingly constitute a new form of electricity ecosystem.

⁷² Relaxing Part 3 rules is discussed further in Meade (2018) and Meade (2021).

Key questions to consider in relation to this section:

1. Are you able to retrofit insulation, and efficient, low-emissions space and water heating in your home, marae, papakāinga or social housing?
2. Would it cost more to operate low-emissions space and water heating in these contexts (compared with your existing options)?
3. What information, cost or other barriers do you face in adopting and operating low-emissions heating?
4. What type and level of support would you need to overcome any barriers to uptake and ongoing operation of low-emissions heating?
5. Do you have opportunities to develop renewable generation and/or hydrogen at either large scale or micro-grid level? Are your geothermal interests adversely affected by the CCC's recommendations, and how might that be addressed?
6. What sort of partners would you want in any developments like these?
7. What barriers do you anticipate in pursuing those opportunities, and what types and level of support would you need to overcome them?
8. Would better recognition of Māori rights and interests in freshwater and the foreshore and seabed improve your ability to invest in renewable generation and/or hydrogen production, and what support would you need to secure such recognition?
9. Do you see a need for an emissions right quota for Māori to ensure Māori geothermal operators and investors are able to make use of their geothermal interests?

5. Agriculture and Forestry

Key points from this section:

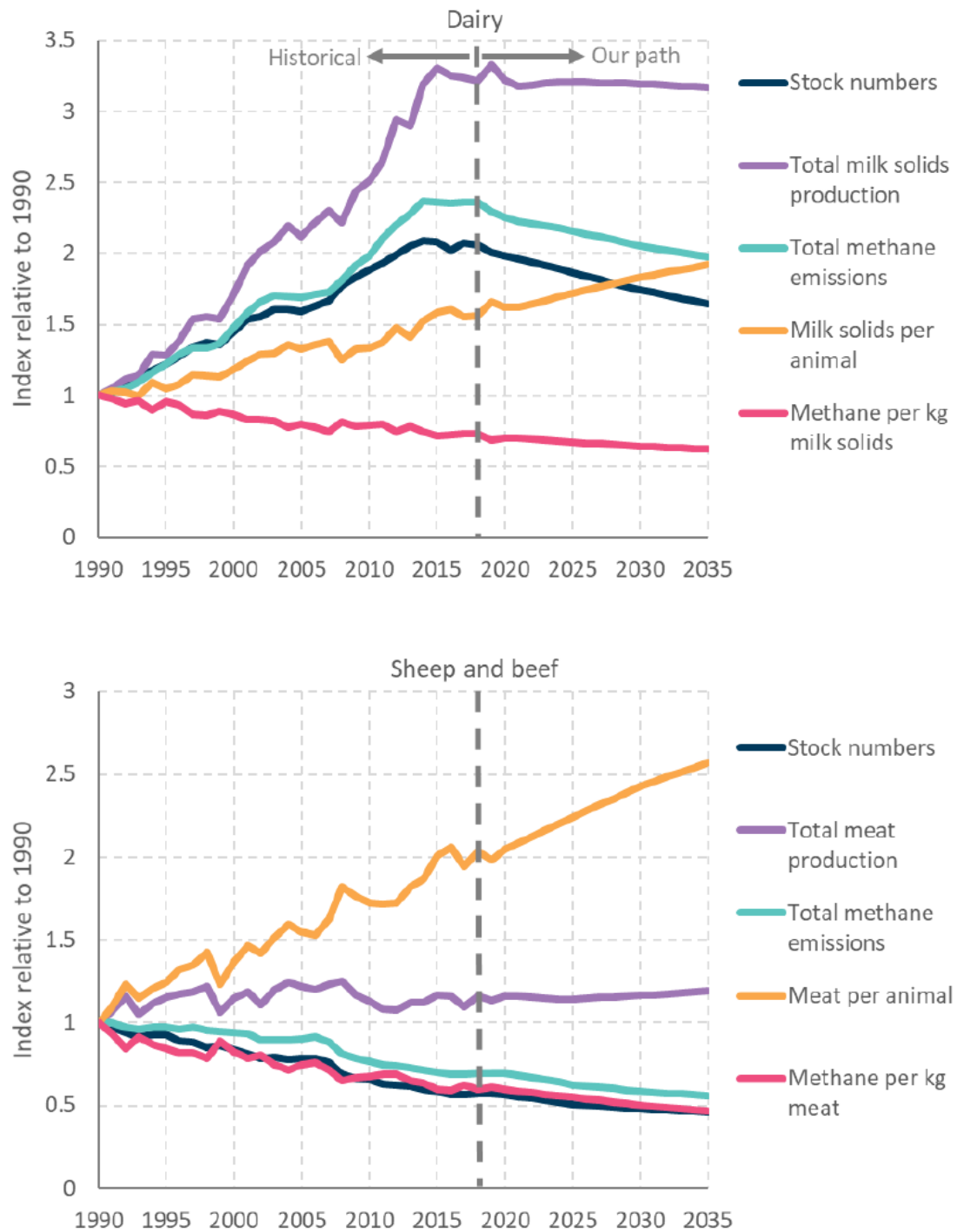
1. The CCC is recommending changes to on-farm practices and livestock genetics to reduce emissions while maintaining output levels.
2. It is also recommending ongoing exotic afforestation (though less so for carbon sequestration purposes), as well as increased native afforestation for longer-term carbon sequestration purposes.
3. While the conversion of farms into forests reduces rural jobs and displaces rural communities, under the CCC's recommendations rural job losses are expected to be slightly less than they would already be under business as usual policies.
4. Farming and forestry are important sectors for Māori asset owners and jobs, and there is a risk that the CCC's recommendations might lock late-developing Māori landowners into lower-value land uses, as has happened with the ETS and other schemes.
5. Furthermore, some Māori landowners face governance, management and capital access constraints that might impede their uptake of least-cost – or even profitable – changes to on-farm practices and livestock genetics in order to achieve required emission reductions.
6. Possible opportunities for Māori in transitioning to low-emissions agriculture and increased afforestation include:
 - a. Reduced competitive disadvantage relative to non-Māori farmers;
 - b. Sustainable competitive advantage through differentiation based on Māori values;
 - c. Improvements in farm profitability from improved practices;
 - d. Employment opportunities in farm monitoring, information/advice, and low-emissions technologies;
 - e. Cultural and commercial co-benefits – and employment possibilities – from native afforestation; and
 - f. Use of biomass and natural fibres for sustainable fuels, heating and insulation.

5.1 What the CCC is Recommending

155. As discussed in Section 1.3, the CCC is recommending that:

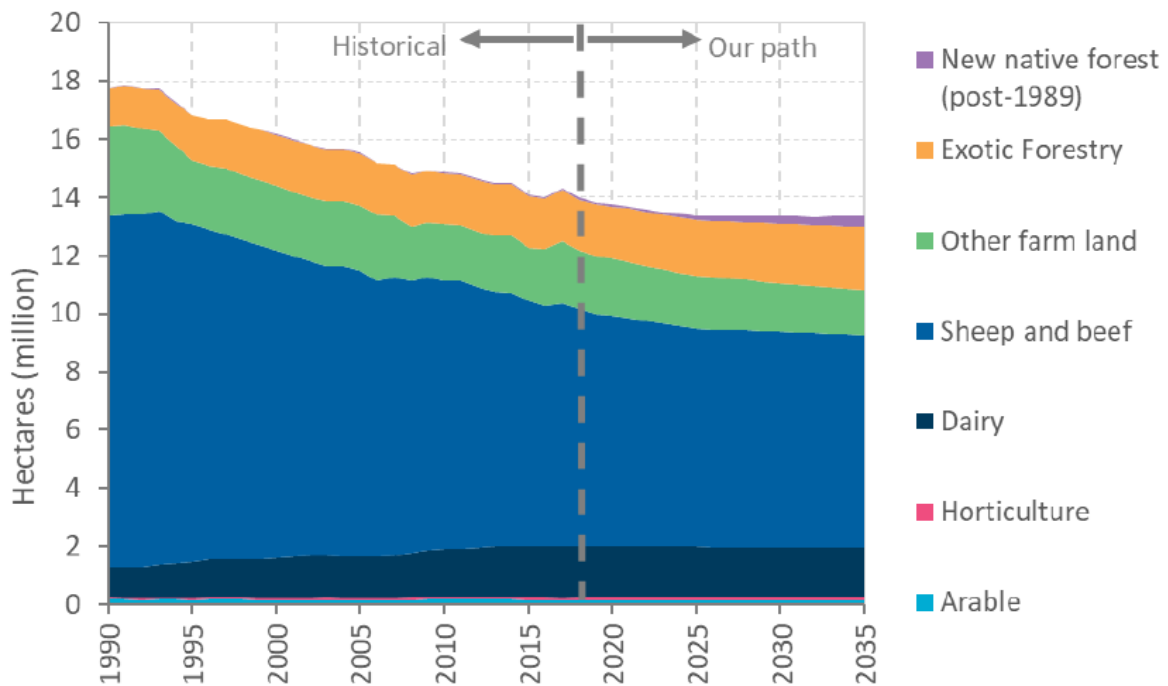
- 155.1. Low-emissions on-farm practices and livestock breeding be used to reduce agricultural emissions, even without assuming the availability of methane inhibitors or vaccines, and recognising that a certain level of emissions reductions is likely to arise due to changing water quality regulation (e.g. under existing initiatives and RMA reforms);
- 155.2. Exotic afforestation (e.g. in *pinus radiata*) be continued at significant levels, though for production rather than long-term carbon sequestration purposes (possibly requiring changes to the ETS or local land use planning); and
- 155.3. Native afforestation be ramped up to comparable levels as exotic afforestation, but for longer-term carbon sequestration purposes (with likely co-benefits in terms of biodiversity and other environmental services, but with possibly greater loss of rural community jobs than already occurs with farmland being converted to exotic forestry).
156. The CCC's anticipated – and interrelated – changes in agriculture and forestry are illustrated in Figures 5.1-5.3:
- 156.1. Based on its own modelling, the CCC expects employment falls for sheep and beef farming under status quo policies (e.g. due to farms being converted into forestry including exotic forestry for carbon sequestration), but slightly smaller falls under its proposed future pathway;
- 156.2. Similar effects can be expected for meat processing – i.e. falling employment under status quo policy, but perhaps slightly less so (all other things being equal) under the CCC's recommendations.
157. The CCC anticipates that such changes in agriculture will mean agricultural output can be sustained with lower emissions, even with a certain amount of land use change (e.g. from sheep and beef into forestry), and possibly with increases in farm profitability for some farms.

Figure 5.1 – The CCC's Anticipated Changes in Livestock Production and Emissions



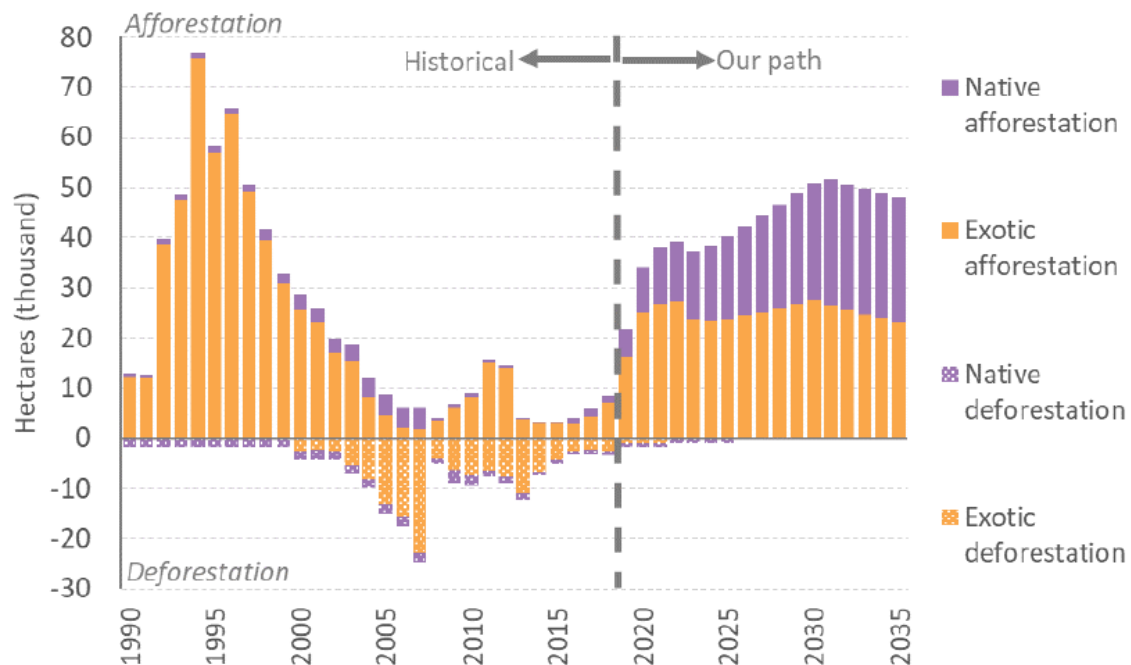
Source: Figure 3.16 of the CCC Report.

Figure 5.2 – The CCC's Anticipated Changes in Land Use for Agriculture and Forestry



Source: Figure 3.17 of the CCC Report.

Figure 5.3 – The CCC's Anticipated Changes in Exotic and Native Afforestation



Source: Figure 3.18 of the CCC Report.

5.2 Importance to Māori of Agriculture and Forestry

158. As discussed, for historical and cultural reasons a range of iwi and other Māori collectives (large and small) are strongly represented in land-based primary sectors – especially sheep and beef farming and forestry:

158.1. This is true of the Māori asset base, and also in employment terms (when downstream meat and forestry processing is considered).

159. Even though the rate of return generated by these investments is not as high as in other sectors, the total return to Māori generated by these interests is very significant.⁷³

160. Through Te Tiriti settlements many iwi are significant owners of pre-1990 forest land, as are some other Māori collectives who granted long-term leases to third parties for afforestation purposes:

160.1. In addition, Māori have a significant interest in land used for sheep and beef farming which could be converted into forestry if that provided better returns and other outcomes to landowners;

160.2. Māori also have a significant share of remote, steep and erosion-prone land for which afforestation for sequestration purposes (including native reversion) might be beneficial if that improved returns and other outcomes to landowners.

161. Importantly, for economic and cultural reasons many Māori landowners have not converted their land to more intensive and emissions-intensive uses (e.g. dairy farming), which can also be more profitable uses:

161.1. The introduction of forestry into the ETS in 2008, including deforestation charges for converting pre-1990 forest land into farming, has already impeded the ability of some Māori landowners to switch to more intensive farming;⁷⁴

161.2. The CCC's recommendations is likely to do likewise, subject to how free allocations of methane emissions rights will be allocated (as they will likely need to be to avoid emissions simply shifting offshore – “emissions leakage”), with implications for the

⁷³ Meade and Rice (2021).

⁷⁴ As has/will the introduction of nitrates emissions schemes for Lake Taupo and Lake Rotorua.

nature and pace of socio-economic development of Māori collectives and communities.

5.3 Opportunities for Māori in Transitioning to Low-Emissions Agriculture and Forestry

Reduced Competitive Disadvantage relative to Non-Māori Farmers

162. For many Māori farmers, the CCC's recommendations reduce any competitive disadvantage they might suffer relative to other Aotearoa farmers from applying ta ao Māori to their farming practices:⁷⁵

162.1. Where Māori farmers operate in undifferentiated commodity markets, adopting less-intensive land use generates benefits in terms of discharging kaitiaki obligations towards te taiao and future generations, but potentially involves financial sacrifice;⁷⁶

162.2. If all farmers are required to adopt similar land use practices in order to reduce emissions, this lowers the potential profit sacrifice faced by Māori farmers in pursuing similar outcomes for cultural rather than regulatory purposes.

Possible Sustainable Competitive Advantage through Differentiation based on Māori Values

163. Additionally, Māori farmers that adopt less intensive land uses (e.g. lower-emissions farming) might potentially enjoy sustainable advantages over other farmers with comparable land use by virtue of being able to brand their offerings with additional qualities relating to Māori values, such as community development:

163.1. Provided Māori farmers are able to sell differentiated offerings to discerning consumers, and access investors and employees that share their environmental, social and ethical values, they should be able to enjoy better returns or lower costs than other providers who achieve similar environmental outcomes, because of the additional Māori values they can bundle into their offerings.

164. Likewise, even for exotic plantation forestry for production purposes, there may be scope to differentiate logs and timber products in terms of not just the sustainability of their

⁷⁵ Though any competitive disadvantage they suffer relative to overseas farmers could remain.

⁷⁶ Meade (2019) discusses circumstances under which using land for cultural purposes either increases or decreases the profitability of land use.

production, but also their other embedded Māori values, as well as their contribution to Māori socio-economic development.

Possible Improvements in Farm Profitability from Improved Practices

165. There is scope, especially for less-intensive farming like sheep and beef farming, to improve farm profitability while reducing emissions, at least over a range of emissions reductions:

165.1. This is because some farm management practices involve the overuse of farm inputs, or can otherwise be improved without sacrificing profits;

165.2. It is also because better understanding of livestock genetics might yield benefits in terms of both production and environmental outcomes.

166. Key to unlocking this potential is low-cost monitoring of farm management practices and associated environmental and production outcomes, and access to information/advice and technologies for improving practices, tailored to the relevant farming context.

Employment Opportunities in Farm Monitoring, Information/Advice, and Low-Emissions Technologies

167. There is likely to be strong growth in the need for experienced and qualified farming consultants, and providers of monitoring and emissions-reduction technologies, to achieve the sorts of on-farm improvements anticipated by the CCC:

167.1. This raises possible training and employment opportunities for Māori, especially those with a commitment to serving their home regions who would enjoy continuity of work and be able to make a return on their training while also contributing to sustainable use of traditional lands, and community development.

Cultural and Commercial Co-Benefits – and Employment Possibilities – from Native Afforestation

168. Relatedly, Māori landowners with marginal farm land that is remote, steep and/or erosion-prone might be able to secure a range of cultural and commercial co-benefits from native afforestation for carbon sequestration purposes:

168.1. Carbon sequestration would generate a value stream by earning tradable emission rights under the ETS (assuming native afforestation is accounted for as post-1989

forestry) – albeit the growth of native flora is much slower than other species, so this return would arise only slowly;

168.2. Additionally, native afforestation may yield cultural benefits to Māori landowners in terms of restoring te taiao to a more natural state after decades (or centuries) of degradation;

168.3. Depending on the type of native afforestation, commercial co-benefits might arise in terms of things like manuka honey production (with potential benefits from co-branding honey production with community development, carbon sequestration, native ecosystem regeneration, etc), the commercialisation of bio-actives from sustainably produced native flora, and perhaps eco-tourism and/or adventure tourism; and

168.4. Subject to the development of suitable funding streams for ecosystem services like erosion control and biodiversity, additional commercial value might arise from native afforestation, even though that afforestation is not for the purposes of fibre production (although it might yield that potential, on a sustainable basis, for future generations).

169. Employment possibilities also arise from native afforestation, in terms of developing nurseries of suitable root stock, and from fencing and pest control of planted areas which would otherwise be vulnerable to damage.

Use of Biomass and Natural Fibres for Sustainable Fuels, Heating and Insulation

170. There is potential to create additional or alternative value streams for existing fibre produced using Māori land. These include:

170.1. Using wood processing waste for renewable heating fuel (e.g. pellets for wood burners);

170.2. Using wood fibre or wood processing waste for biofuels; and

170.3. Using wood or other natural fibres (e.g. wool) for sustainable insulation products.

What Policies or Other Support Measures Might be Required?

171. As discussed in Sections 3.6 (transport opportunities) and 4.5 (electricity and non-industrial heating opportunities), realising any benefits from differentiating agricultural production based on its embedded Māori values – so as to secure pricing premiums – is likely to require:
- 171.1. Certification, standards and monitoring/reporting schemes to verify to customers, capital suppliers and employees that the relevant Māori values are being complied with; and
 - 171.2. Intellectual property rights (IPR) protections for Māori values and mātauranga Māori, so that they cannot easily be imitated.
172. While certification, standards and monitoring/reporting schemes are likely to need to be independent, Māori would have a key role in their design and governance, for which support may be necessary:
- 172.1. Likewise, IPR development will likely require non-Māori participation, but Māori would have a key role in its design and governance, with support from government.
173. Improvements in farm profitability through improved on-farm practices and genetics will require access to suitable farm monitoring and information/advice, and associated technologies for reducing emissions while improving returns:
- 173.1. Support would also be required for training to enable Māori to provide the relevant services to Māori and other farmers.
174. Key to maximising the benefits of native afforestation will be providing multiple value streams from the same forests – over and above carbon sequestration benefits under the ETS, such as through:
- 174.1. Support for R&D into innovative products using native flora, as well as stronger IPR protection for mātauranga Māori;
 - 174.2. Development of payment streams for ecosystem services, such as biodiversity and erosion control;

- 174.3. Support to develop viable eco-tourism and/or adventure tourism possibilities in areas that might not already attract significant tourist numbers (pandemic border restrictions aside).
175. Finally, using biomass and natural fibres for sustainable fuels, heating and insulation is likely to require considerable R&D and investments in early-stage commercialisation before it can be taken to market:
- 175.1. Support for such R&D and early-stage commercialisation is likely to be key.

5.4 Risks/Barriers for Māori in Transitioning to Low-Emissions Agriculture and Forestry

Māori Land being Locked in to Less Profitable Uses

176. The CCC Report (p. 97) recognises that Māori might face a late-developer disadvantage in agriculture:
- “Consideration should also be given to any policies that could disadvantage Māori-collectives operating in the agriculture sector. When agricultural emissions are priced, free allocation should be provided in a way that does not disadvantage operators who were already managing resources in alignment with their kaitiaki values. In addition, some Māori-collectives may not operate intensively due to insufficient resource or being precluded from exercising their decision-making functions as a result of historic arrangements, such as perpetual leases. These Māori-collectives should also not be disadvantaged. Any approach that uses grandparenting is likely to be problematic.”
177. Where new arrangements for agriculture involve free allocations of methane emission rights, grandparenting them based on historical emissions has certain rationales, but disadvantages late-developing Māori land-owners who would receive relatively low allocations, and would therefore face barriers in intensifying land use into more profitable activities:
- 177.1. Likewise, discouraging exotic forestry for carbon sequestration purposes might preclude the only viable alternative for more profitable use of marginal Māori land such as steep and erosion-prone farmland;
- 177.2. Similarly, deforestation liabilities for pre-1990 forest land under the ETS reduces the ability of Māori forest land owners to convert to uses with higher commercial value (e.g. farming) or cultural value (e.g. papakāinga).

178. Using Māori land for long-term carbon sequestration would similarly reduce options for changes to higher-valued uses in the future, emphasising the need for assured payment and other value streams being in place before such hard-to-reverse long-term investments are made.

Hollowing Out of Rural Communities

179. The CCC Report acknowledges that changing land use from farming to forestry leads to rural job losses, and more so if it is carbon sequestration rather than production forestry (which requires more labour for both production and downstream processing):

179.1. In turn this reduces the viability of associated farming support services, and the rural communities that farming and these services sustain.

180. For Māori landowners, such lost employment opportunities may weigh heavily when considering changing out of farming into either exotic or native afforestation, especially for carbon sequestration purposes, particularly if it is local Māori employment that is at stake.

Barriers to Accessing Information, Technologies and Capital needed for Improved Farming Practices and Genetics

181. Many larger iwi and other Māori collectives (e.g. incorporations and land-owning trusts) active in the agriculture and forestry sectors are well-resourced, governed and managed:

181.1. They are likely to enjoy certain advantages in accessing information/advice, technologies, and the capital required, to improve on-farm practices and livestock genetics to achieve emissions reductions:

181.2. Many are doing so already, and also differentiating their product offerings to attract premiums based on embedding Māori cultural values in their production processes and branding.

182. A great many other Māori collectives, however – especially smaller ones and those with more challenging lands – face a range of constraints in accessing these necessary ingredients to reduce their emissions while not unduly sacrificing commercial and cultural returns.

What Policies or Other Support Measures Might be Required?

183. To avoid late-developing Māori land from being locked in to lower-valued uses, it may be necessary to complement any grandparenting of methane emission rights allocations with dedicated quotas for the relevant Māori landowners:

183.1. Similar to how special allocations were made for forestry under the ETS (e.g. special emission right allocations to iwi securing pre-1990 forest land through Te Tiriti settlements).

184. Relatedly, there is urgent need to establish mechanisms for ecosystem payments if Māori landowners are to commit their land to be used for long-term carbon sequestration through native afforestation:

184.1. Even with such payments secured, additional support may be necessary for ongoing fencing and pest control costs to protect native afforestation schemes, which might otherwise be a burden to landowners.

185. Māori concerned with the ongoing vitality of rural communities may need assistance to retrain farm sector workers displaced by increasing afforestation who might otherwise relocate in order to find jobs.

186. Support for farming information/advice and improved genetics may be critical if Māori landowners with governance, management and financing constraints are to be able to identify least-cost – and ideally profitable – ways to reduce on-farm emissions.

Key questions to consider in relation to this section:

1. What opportunities do you see to change your on-farm practices and livestock genetics to reduce farm-level emissions, while potentially improving profits?
2. What barriers do you foresee, and what support would you need to address them?
3. Do you think you can offer farm or forestry products differentiated in terms of Māori values, and earn a premium by doing so?
4. What support would you need to achieve such a branding advantage?

5. How concerned are you about the loss of rural jobs due to farm conversion into forestry? Would it be worse if new forests were for long-term carbon sequestration instead of production forestry?
6. What barriers do you face in converting your farm or forest land into uses with greater commercial or cultural returns? Will the CCC's recommendations reduce or increase the options you have to use your land in better ways?
7. Do you agree that some sort of Māori quota for methane emission rights might be required to avoid late-developing Māori landowners being prevented from better using their land?
8. Do you support a possible exemption for Māori landowners to use their land for exotic carbon sequestration forestry – especially on remote, steep and/or erosion-prone land – even if this is otherwise discouraged for other landowners?

6. Industrial Process Heat

Key points from this section:

1. The CCC is recommending that industrial process heat be quickly transitioned to renewable sources (electricity and biomass).
2. This is particularly relevant to Māori due to its impact on food processing (and to a lesser extent wood processing), which are important for Māori employment, but also for Māori suppliers of inputs (meat, milk) to food processors.
3. Food processors, especially smaller Māori-owned ones, may require assistance in identifying least-cost options, and to cover the capital and increased operating costs associated with switching to higher-cost fuels – especially if additional investments in fuel supply infrastructure are required – if the CCC’s recommendations are to be achieved in a timely way.
4. Possible opportunities for Māori in this context include:
 - a. The bundling of Māori values in processed food products to achieve premiums from differentiated offerings; and
 - b. Supplying and transporting the required biomass for low-emissions heating, investing in renewable generation, and/or hydrogen production.

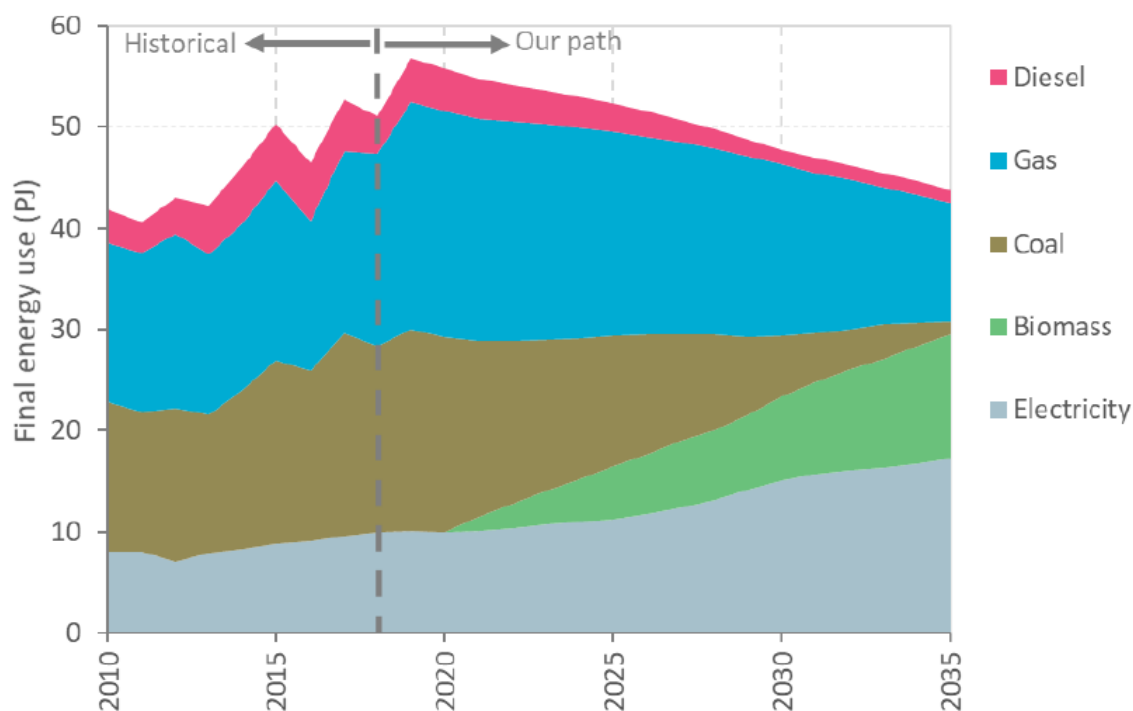
6.1 What the CCC is Recommending

187. As discussed in Section 1.3, the CCC recommends that industrial process heat for things like food (e.g. dairy and meat) processing and pulp and paper production should rapidly transition from coal and gas (and diesel) to biomass and electricity, with implications for upstream sectors like coal supply, and oil and gas.

188. The CCC’s anticipated transition is illustrated in Figure 6.1:

188.1. The CCC acknowledges that biomass will not be a viable alternative fuel in parts of the country where there is not a local or nearby wood processing operations with biomass not required for mills’ own energy needs;

Figure 6.1 – CCC's Anticipated Energy Pathway for Food Processing to 2035



Source: Figure 3.15 of the CCC Report.

188.2. It likewise acknowledges that electrifying industrial process heat will require investments in transmission and distribution infrastructure, as well as investments in renewable electricity generation.

189. The CCC does not propose the use of sustainably-produced hydrogen as an alternative to either coal or natural gas for industrial process heat.

6.2 Importance to Māori of Industrial Processes Heat

190. Meat processing, and to a lesser extent dairy processing, is significant for Māori employment:

190.1. Furthermore, the cost-competitiveness of food processing is important to upstream Māori farmers who supply inputs for food processing.

6.3 Opportunities for Māori in Transitioning to Low-Emissions Industrial Process Heat

Biomass Production and Transportation, Renewable Generation, and Hydrogen Production

191. As discussed in Section 5.3, Māori landowners might enjoy additional value streams by using wood processing waste for biomass fuel:

191.1. This might create additional opportunities for Māori in the transport sector, moving biomass to where it is needed for heating.

192. Likewise, as discussed in Sections 3.6 (transport) and 4.5 (electricity and non-industrial heating), Māori might enjoy opportunities in renewable electricity generation investment, and/or hydrogen production:

192.1. These could conceivably contribute to the CCC's objective of shifting industrial process heat to low-emissions technologies.

Bundling Māori Values in Processed Food Products to achieve Premiums from Differentiated Offerings

193. In earlier sections, potential was identified for Māori in relation to sustainable branding advantages based on Māori cultural values:

193.1. This potential relates primarily to situations where Māori organisations can make differentiated offerings to consumers, capital suppliers, and employees whose values align with those Māori values.

194. In relation to food processing an additional challenge arises in distinguishing inputs supplied by Māori farmers in accordance with Māori values and those supplied by other suppliers:

194.1. This means that food processors – who in many cases introduce branding at the processed good level (though oftentimes they supply inputs to downstream food processors who introduce branding at that stage) – would need to offer different brands based on the source of their inputs;

194.2. In principle this is achievable – e.g. for organic and non-organic produce – though may involve additional setup and ongoing processing and branding costs.

195. This means any profitable differentiation achievable by suppliers whose inputs bundle attributes related to Māori values might also be achievable at the food processor level:

195.1. This would be simpler to achieve by smaller processors serving distinct communities of Māori input suppliers, which sometimes arises when processors are owned by collectives of Māori farmers.

What Policies or Other Support Measures Might be Required?

196. Relevant policies or other support measures were discussed in Sections 3.6 and 4.5, relating mainly to:

196.1. How to achieve differentiation based on embedding Māori values in production; and

196.2. How to support Māori into renewables generation and/or hydrogen production.

6.4 Risks/Barriers for Māori in Transitioning to Low-Emissions Industrial Process Heat

197. Many food processors are large entities with the resources to identify least-cost options for converting to low-emissions industrial process heat:

197.1. That said, the capital cost of conversion, as well as likely increased operational costs, will affect the cost-competitiveness of even large food processors, with implications for upstream Māori suppliers of inputs (meat, milk).

198. Smaller processors – including Māori-owned processors – may face greater barriers in identifying and adopting least-cost options, and will likewise have to bear capital and ongoing operational costs in switching from current least-cost heating options:

198.1. This is especially the case if there are scale economies in any alternative heating solutions, as there may be if investments in infrastructure for supplying electricity or biomass are required.

199. Transitioning away from coal and gas (and diesel) to renewable energy sources will contribute to the possible contraction of domestic coal and gas production:

199.1. The CCC acknowledges that its recommendations will result in even greater job losses in those sectors that are already anticipated under business as usual policies, though employees in those sectors have skills that are relatively transferable (even if that requires transferring offshore);

199.2. While Māori in these affected sectors are likely to face costs from retraining or relocating, the overall impacts for Māori employment should be expected to be relatively modest given the scale of the affected workforces.

What Policies or Other Support Measures Might be Required?

200. Just as support is required for public and private organisations like schools, hospitals and rest-homes to convert to lower-emissions heating, so too is it likely to be required for food processors switching to low-emissions process heat:

200.1. This will be especially so if additional investments in infrastructure for electricity or biomass supply are required.

Key questions to consider in relation to this section:

1. What barriers do you face in switching food process heat to renewable sources?
2. What type and level of support would you need to achieve this transition in a timely way?
3. What opportunities do you see in supplying renewable energy to food processors?
4. What support might you need to take advantage of such opportunities?

7. Other Considerations, and Conclusions

7.1 Partnership

201. Earlier sections of this report discuss the substance of what is required for Māori to maximise opportunities and manage risks/barriers in the transition to a low-emissions economy. However, process considerations will also be important.

202. The CCC Report stresses that the transition to a low-emissions economy will require genuine partnership between Māori and both central and local government:

202.1. Its views are set out in Box 7.1, and illustrated in Figure 7.1.

203. Achieving meaningful partnership is likely to be critical for ensuring Māori are able to influence the design of policies and other measures required for Māori to maximise opportunities and manage risks/barriers in the transition to a low-emissions economy, including in relation to matters like governance of the CCC itself, as well as:

203.1. Design of emissions-reduction institutions, policies and support measures:

203.1.1. Perhaps including those regarding funding and support for social and/or business case development, and/or capital raising, in relation to any opportunities for Māori in the transition;

203.1.2. But also including any relating to targeted support measures required to ensure the transition relieves (or at least does not worsen) – rather than exacerbates – any existing Māori socio-economic deficits;

203.2. Creation of certification, standards and monitoring/compliance schemes, as well as suitable IPR protections for mātauranga Māori, to enable Māori to take full advantage of the social and commercial potential of Māori values and traditional knowledge;

203.3. Development of a Māori emissions profile (as recommended in Section 6.2.5 of the CCC Report); and

203.4. The development of training (and retraining) systems tailored to Māori issues and practices.

Box 7.1 – CCC's Recommendations for Partnership between Māori and Central/Local Government

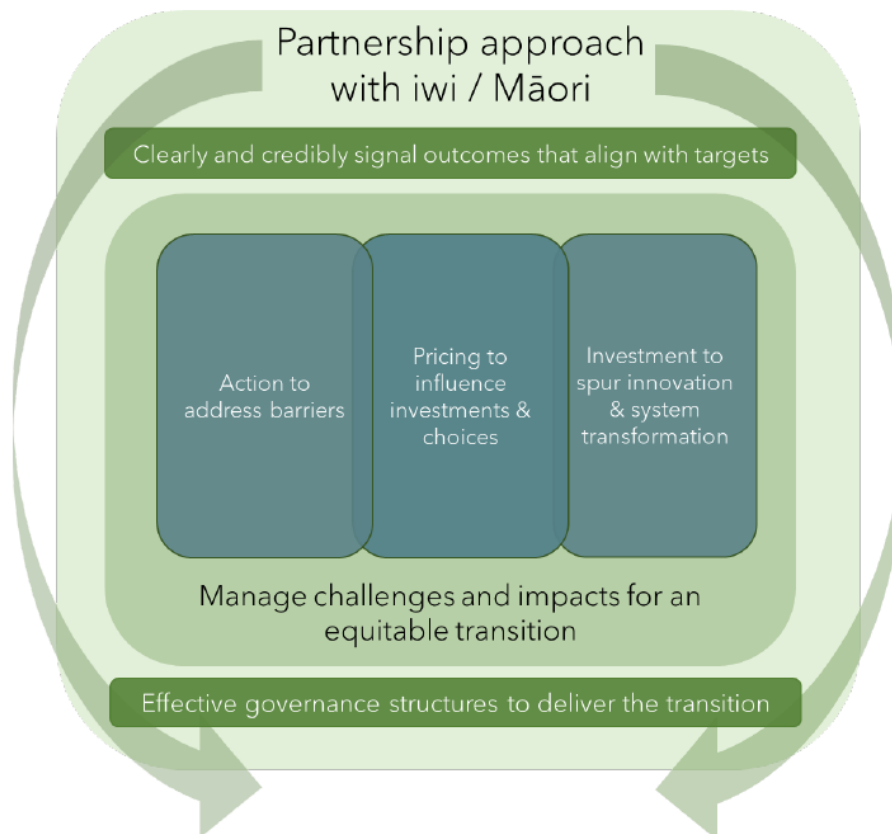
Genuine, active and enduring partnership with iwi/Māori

We recommend that, in transitioning Aotearoa to a thriving, climate-resilient and low emissions future, central and local government take action to ensure genuine and enduring partnership with iwi/Māori that gives effect to:

- a. **Tiakitanga and manaakitanga** by acting as good stewards and demonstrating equitable and mana enhancing behaviour within the Treaty Partnership. This requires real acknowledgement of rangatiratanga and enables iwi/Māori to exercise their role as kaitiaki.
- b. **Tikanga and kotahitanga** by working in partnership with iwi/Māori, through the right decision-makers and following the right process, to ensure Māori communities can prepare for and transition to a climate-resilient, low emissions Aotearoa. This is premised on iwi/Māori aspirations for intergenerational wellbeing; aspirations that are shared by many New Zealanders.
- c. **Whanaungatanga** by enhancing relationships within whānau and communities and with the whenua (land) or taiao (environment).

Source: Enabling Recommendation 3 of the CCC Report.

Figure 7.1 – How the CCC Envisages the Partnership Approach Working



Source: Figure 6.1 of the CCC Report.

204. How Māori and the Crown maximise opportunities and manage risks/barriers for Māori in the transition to a low-emissions economy – both now and in the lead-up to 2050 – will be an important test of the evolving Crown-Māori relationship.

7.2 Fair, Equitable and Just Transition

205. The CCC Report stresses the importance of ensuring that the transition to a low-emissions economy does not lock in existing disadvantage and either create or exacerbate disadvantage, acknowledging that many Māori are particularly disadvantaged already, and might become more so if the transition is not managed well:

205.1. For example, the CCC Report states (p. 97) that it anticipates net job gains for Māori from the transition to a low-emissions economy, but acknowledges that those new jobs will be at similar or lower wages.

206. It is well-accepted that previous major transitions in New Zealand have imposed disproportionate costs on Māori. For example, in a 2021 assessment by MBIE of the possible employment impacts of a transition to a low-emissions economy:

“Māori account for a high share of employment in emissions-intensive industries – particularly those industries characterised by relatively low qualification levels. Of the high emissions intensity industries that were analysed in this research, the sheep and beef industry has the largest Māori workforce (both as a share of the workforce and in absolute terms). In future, this industry is likely to face pressures both as an emissions-intensive industry, and as incentives to shift to alternative land uses strengthen as prices in the Emission Trading Scheme rise.

“Māori employees have historically fared poorly in transitions and economic shocks such as the economic reforms of the 1980s ... They have also weathered other significant impacts, such as the Christchurch earthquakes, less well than Pākehā workers ...

“Ultimately, the extent to which Māori workers are exposed to job displacement or reduced demand for labour in certain industries will depend on the types of change that firms undergo as New Zealand transitions to a low-emissions economy. However, given that Māori account for a high share of employment in high emissions intensity industry and have traditionally fared poorly in shocks and transitions, there is potential for the transition to a low-emissions economy to exacerbate existing inequalities for Māori. Accordingly, it is important that labour market policies, skills and education programmes and measures to support growth of low-emissions economic activity are effective in developing employment and business opportunities for Māori. Monitoring changes in employment patterns for sheep and beef farming, meat manufacturing and road and

rail transport will be particularly important given the large numbers of Māori employed in these industries.”

207. Although the CCC does not make specific recommendations for the type of support required to ensure a just transition for Māori, it does repeatedly stress the need for such support:

207.1. This means it is for subsequent engagement and policy development to identify and implement the types of support required.

208. The CCC Report also stresses that wealthier nations like Aotearoa have an obligation to shoulder a greater share of emissions reductions than less-wealthy nations, e.g. at p. 75:⁷⁷

“It is well acknowledged internationally that developed nations have a greater responsibility to take the lead in reducing emissions and support developing countries to transition. Developed countries have emitted more cumulative emissions than developing countries and for longer. They have benefited as a result. The principle of ‘common but differentiated responsibilities and respective capabilities’ was enshrined in the United Nations Framework Convention on Climate Change in 1992. It was reiterated and expanded in the Paris Agreement to reflect the national circumstances of all countries.”

209. Applying the same logic at the domestic level, it can be argued that those communities in Aotearoa that have benefitted the most from emissions-intensive activities should shoulder a greater share of the burden for reducing emissions:

209.1. This provides further motivation for the sorts of support measures the CCC recommends, especially if it is accepted that there are Māori communities that for cultural reasons or due to barriers have not developed as quickly as other communities into higher-emitting – and more profitable – activities.

210. Furthermore, policy practice in some other countries (e.g. the UK) explicitly accounts for the recognised issue that policy costs or benefits for low-income citizens can be experienced disproportionately relative to the same policies’ impacts on higher-income citizens. For example, HM Treasury in the UK acknowledges that:⁷⁸

⁷⁷ Similar conclusions are provided on more technical grounds in Errickson et al. (2021).

⁷⁸ See HM Treasury (2003), Annex 5 – quote from para 7 of Annex 5.

“A proposal providing greater net benefits to lower income quintiles is rated more favourably [if distributional concerns are accounted for] than one whose benefits largely accrue to higher quintiles.”

211. This stresses the need to take the particular circumstances of Māori into account when evaluating policies designed to ensure a fair, equitable and just transition to a low-emissions economy.

7.3 Possible Pathways for Māori

212. Ultimately the cost of low-emissions technologies will fall, and therefore become more affordable even to the most disadvantaged of Aotearoa’s communities:

212.1. However, in the almost 30 year transition to 2050, even small differences in those communities’ starting conditions could translate into very wide differences in long-term outcomes.

213. There are at least two possible pathways for Māori in the transition to a low-emissions economy:

213.1. One in which Māori thrive in the transition – despite starting the transition with many well-documented disadvantages – making good use of the many cultural and other advantages Māori enjoy, and receiving adequate, timely and well-targeted support as required; and

213.2. Another in which existing disparities between Māori and non-Māori are exacerbated
– despite making good use of the many cultural and other advantages Māori enjoy
– due to receiving inadequate, poorly-timed or poorly-targeted support.

214. The CCC and others recognise that the transition will drive inequality unless support is provided to at-risk and vulnerable members of the community:⁷⁹

214.1. Meaningful partnership is also a necessary component for determining which of the above two pathways is ultimately followed.⁸⁰

⁷⁹ E.g. Cha (2017).

⁸⁰ Bargh (2021).

7.4 Conclusions

215. This document provides a high-level overview of:

215.1. What the CCC Report recommends for the transition to a low-emissions economy;

215.2. The starting point from which Māori enter that transition;

215.3. What opportunities and risks/barriers Māori might encounter in the transition; and

215.4. What sorts of policies and other measures might ensure a successful transition for Māori?

216. As stressed at the outset, this document is intended only to frame and stimulate more informed and engaged discussion between Māori communities on the one hand, and MfE and other agents of the Crown on the other, as to how the transition to a low-emissions economy might affect Māori (in positive and negative ways), and what might be required to support Māori in the transition:

216.1. Meaningful engagement and co-design of any required arrangements should be expected to best-ensure that Māori can actively and constructively contribute to the sorts of fundamental changes that are required if the CCC's recommendations are to be realised.

Key questions to consider in relation to this section:

1. What does partnership between Māori and the Crown look like for the transition to a low-emissions economy, and which aspects of partnership will be most important for that transition? How will the required partnership be realised?
2. What will be the key ingredients of a fair, equitable and just transition to a low-emissions economy? How will the fairness of the transition be defined, measured, and ensured? Who should decide, and how?

* * *

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