Forestry Ministerial Advisory Group

"Positioning the forest industry to be a major player in regenerating natural capital, growing regional economies and transitioning to net zero emissions"

Warren Parker

Chair FMAG

OVERVIEW – THREE QUESTIONS

Why re-position the NZ forest industry?

Why regeneration of natural capital matters and forestry's role in this?

Why regional economies need to transition to contribute more to a net zero circular bioeconomy?

"Stand-in 20[50] …."

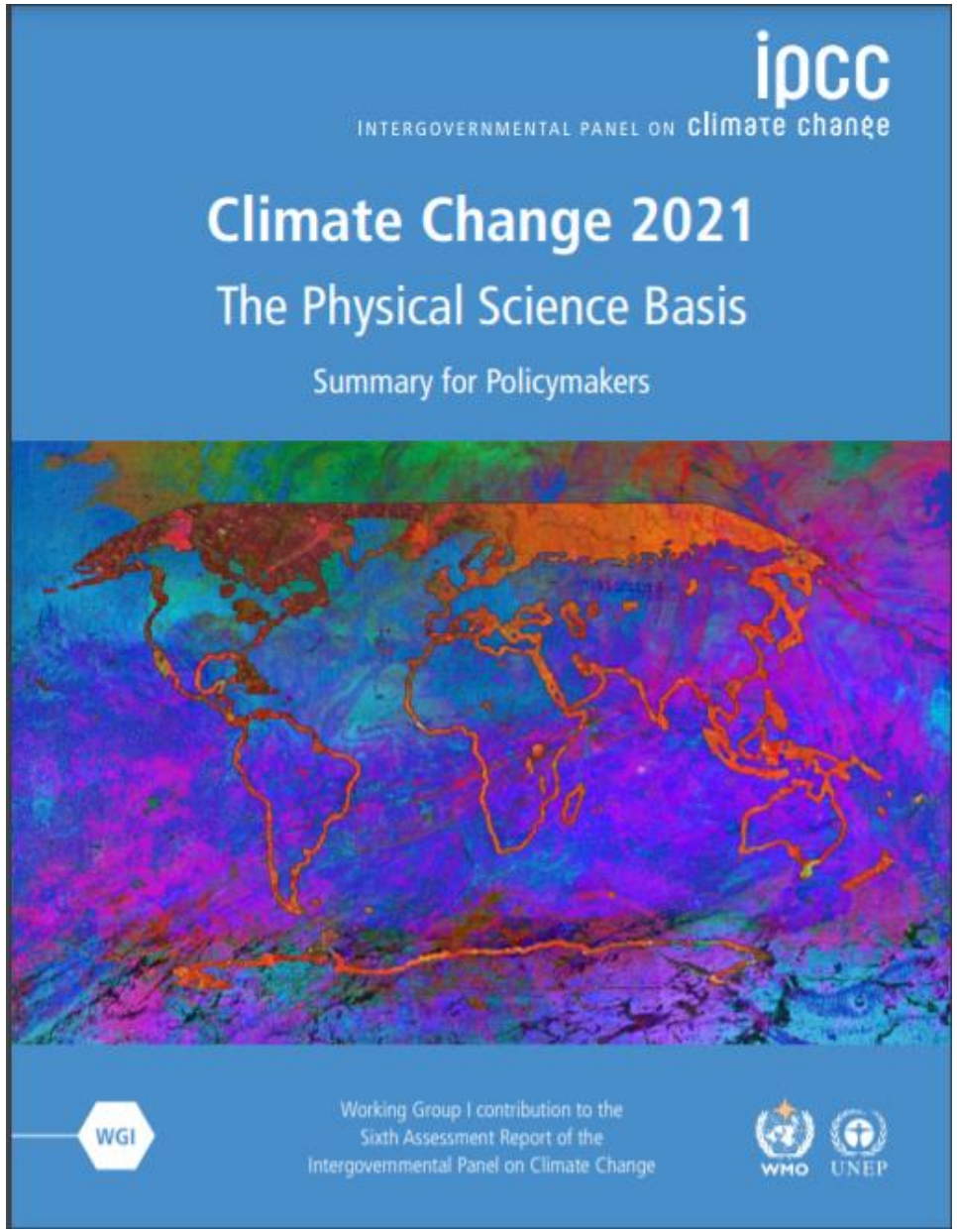
"We cannot work to create a future that we first do not imagine".

P. Ellyard

….. Less oil and gas and coal; different energy mix; bioproducts for packaging, road surfaces, buildings; industrial heat = more trees

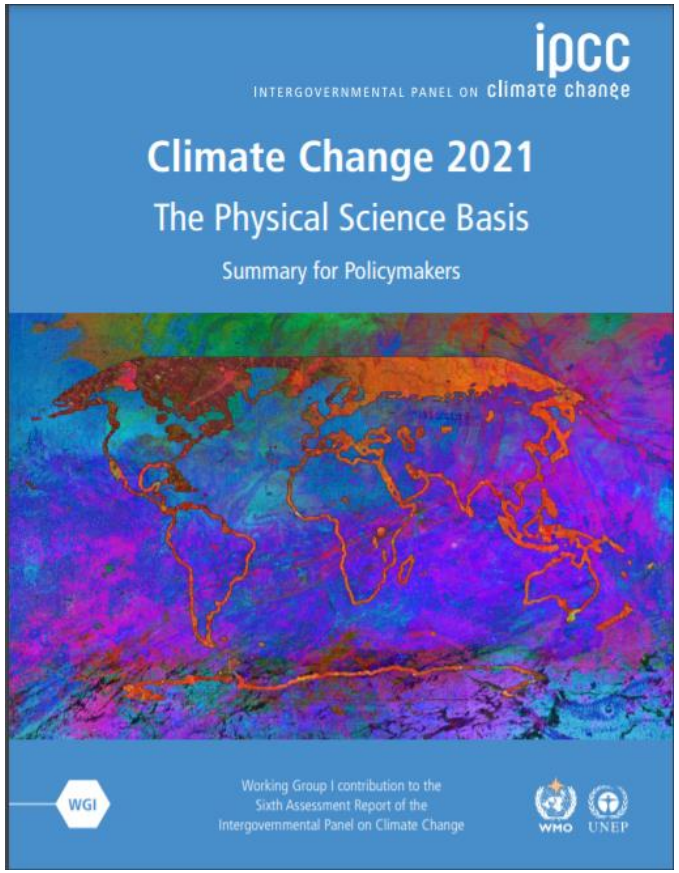
The pressing imperative to decarbonise and reposition economies

9 August 2021

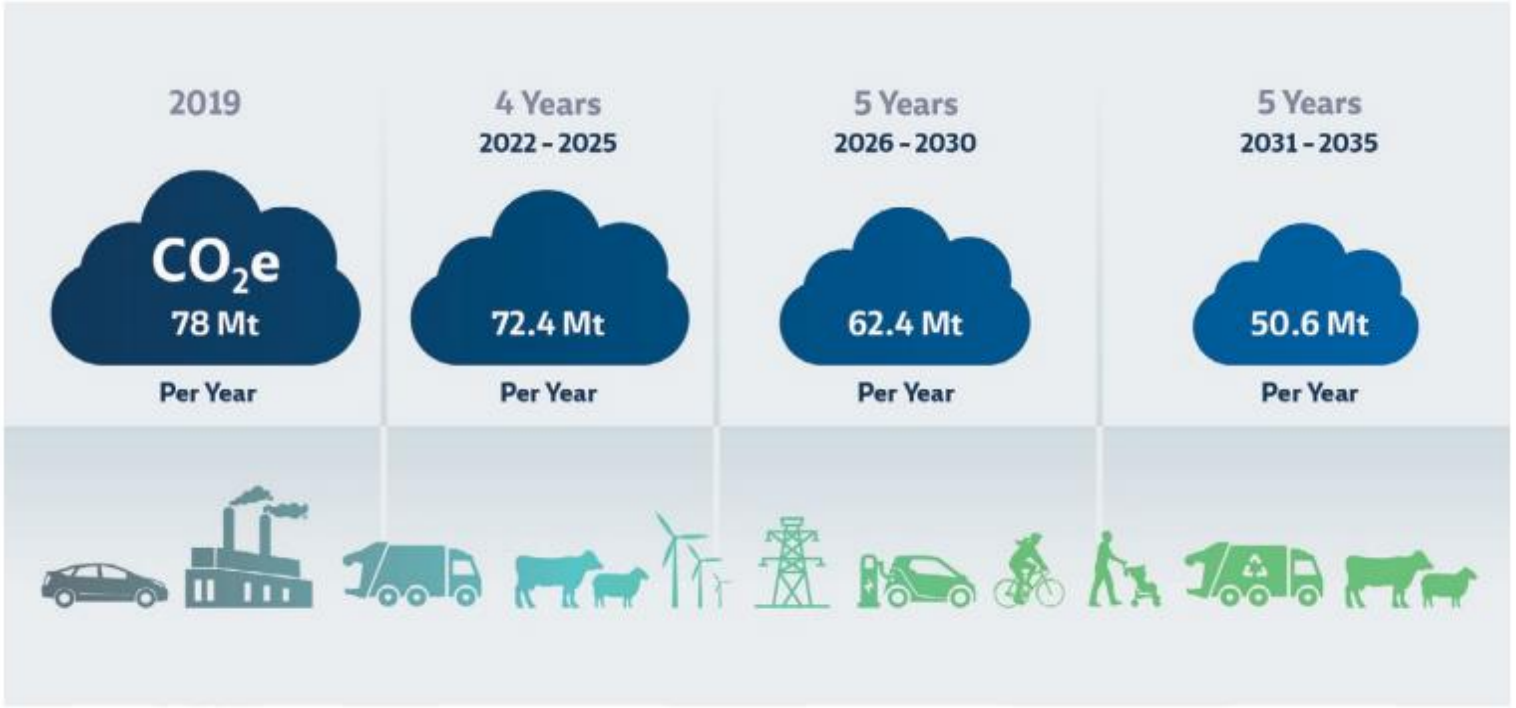


Key messages - two

- …. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in carbon dioxide (CO2) and other greenhouse gas emissions occur in the coming decades.
- From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO2 emissions, reaching at least net zero CO2 emissions, along with strong reductions in other greenhouse gas emissions. Strong, rapid and sustained reductions in CH4 emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality



NEW ZEALAND's CHALLENGE Climate Change Commission Budget (p. 28, 1 June 2021) *"We're not on track to meet our targets"*



Emissions budgets 2022 - 2035 (AR5) annual average emissions

	GWP_{100} values	
	***AR4*, no climate-carbon feedbacks**	***AR5*, no climate-carbon feedbacks**
Carbon dioxide	1	1
Methane	25	28
Nitrous oxide	298	265
HFC-134a	1,430	1,300

Why re-position the forest industry?

Current position

- Logs on wharves
- Debris on beaches
- Forest harvesting ‘scars’
- Mill closures
- I can’t get timber when needed
- Forests displace land for food
- Forestry erodes rural communities
- Peak pine, more natives
- Fragmented non-aligned leadership
- Third largest export earner

Desired future state

Unacceptable and not sustainable

Forestry Ministerial Advisory Group

Land-use change & social license

stuff ☰ business

Carbon-neutral goal could spell the end of hill-country farming

Kerry Worsnop · 05:00, May 01 2019

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New Zealand World Politics Pacific Te Ao Māori Sport Business Country

IN DEPTH

Green Rush: Will pines really save the planet?

9:24 am on 8 October 2019 Share this

Kate Newton, Senior Journalist, In Depth
@katenewtonnz kate.newton@rnz.co.nz

Guyon Espiner, Investigative reporter, In Depth
@GuyonEspiner guyon.espiner@rnz.co.nz

Vast new pine forests are being hailed as a solution to New Zealand's carbon emissions deficit - and promise a lucrative pay
say they're gutting rural communities, not all

https://www.rnz.co.nz/news/in-depth/399192/green-rush-will-pines-really-save-the-

RURAL / FARMING

Spreading forestry blocks ruining rural communities - farmers

From Checkpoint, 6:15 pm on 8 October 2019 Share this

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Spreading forestry blocks ruining rural communities - ... Watch later Share

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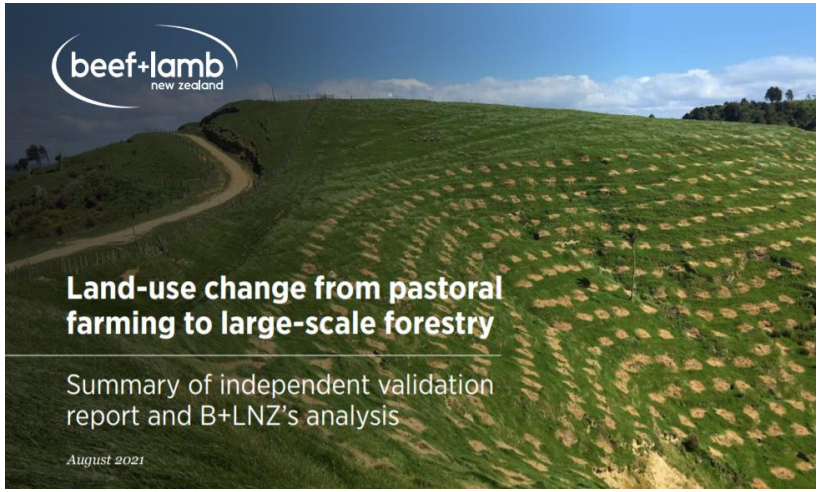
Tuesday, 14 May 2019 09:17

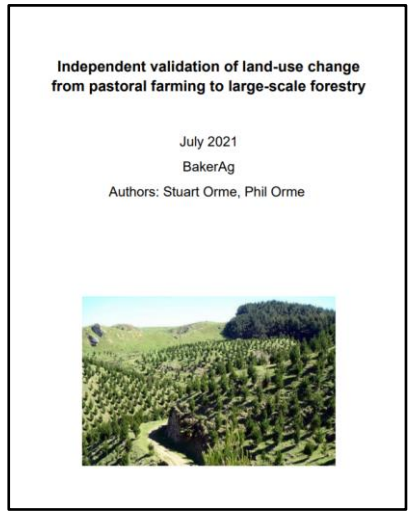
Climate change consultation was 'a farce'

Written by Sudesh Kissun

font size | Print | Email

Federated Farmers Waikato president Andrew McGiven believes animal numbers would have to be effectively halved to meet the 2050 target set by the Government's new Zero Carbon Amendment Bill.




Independent validation of land-use change from pastoral farming to large-scale forestry

July 2021

BakerAg

Authors: Stuart Orme, Phil Orme

Key findings

Whole of Farm Purchase	Year 2017	2018	2019	2020	Grand Total (ha)	Percentage by Conversion
Honey (Mānuka)	3,039	7,340	1,678	2,281	14,338	10.3%
NZ Sales	2,510	11,245	26,198	11,881	51,834	37.2%
OIO	1,455	8,982	10,626	4,883	25,946	18.6%
Total Whole of Farm (ha)	7,004	27,567	38,502	19,045	92,118	66.0%
Partial farm plantings by Landowner through 1BT/JV (2018 – 2020)						
1BT Landowner Grant		12,124 indigenous + 13,434 exotic			25,560	18.3%
Crown Forestry JV		21,822			21,822	15.6%
Total Partial farm funded		47,382			47,382	34.0%
Totals					139,500	100.0%

- Loss of 700,000 stock units
- CCC targets are being met
- Restrict planting LUC <6
- Modify ETS to dissuade investment
- Limit offsetting to 8% emissions

Why re-position the forest industry?

Current position

- Logs on wharves
- Debris on beaches
- Forest harvesting ‘scars’
- Mill closures
- I can’t get timber when needed
- Forests displace land for food
- Forestry erodes rural communities
- Peak pine, more natives
- Fragmented non-aligned leadership
- Third largest export earner

Desired future state

- *Most logs processed onshore*
- *Harvesting with minimal impact*
- *New globally competitive timber mills and biorefineries*
- *Forests co-exist beneficially in landscape and several new forests are planted at large scale (>40,000ha)*
- *Forest supply chain generates high wage jobs and meaningful career paths*
- *Co-ordinated industry leadership and fibre is co-equal with food*
- *Recognition NZ cannot achieve net zero emissions by 2050 without ‘huge’ input from forestry*

Forestry Ministerial Advisory Group

Vision – alignment with the Food & Fibres Sector of Aotearoa

"Our vision is to produce the world's most distinctive, trusted, sought-after food and fibres. Partnered with nature, they speak of our land, water and people. Taiao drives our prosperity, our innovation and leadership. We aspire to be good ancestors. As kaitiaki, we're proud to honour the place we call home."

"People everywhere understand our plantation and indigenous forests, and that the products and services from them, are critical to regenerating Aotearoa New Zealand's natural environment, enriching our communities and powering the transformation to a circular, low-carbon economy."

Forestry Ministerial Advisory Group

Renewable forests – tomorrow's oil fields & key transition pathway to a low C bioeconomy

A Clear, Strong, and Thermally Insulated Transparent Wood for Energy Efficient Windows

*Ruiyu Mi, Tian Li, Daniel Dalgo, Chaoji Chen, Yudi Kuang, Shuaiming He, Xinpeng Zhao, Weiqi Xie, Wentao Gan, Junyong Zhu, Jelena Srebric, Ronggui Yang, and Liangbing Hu**

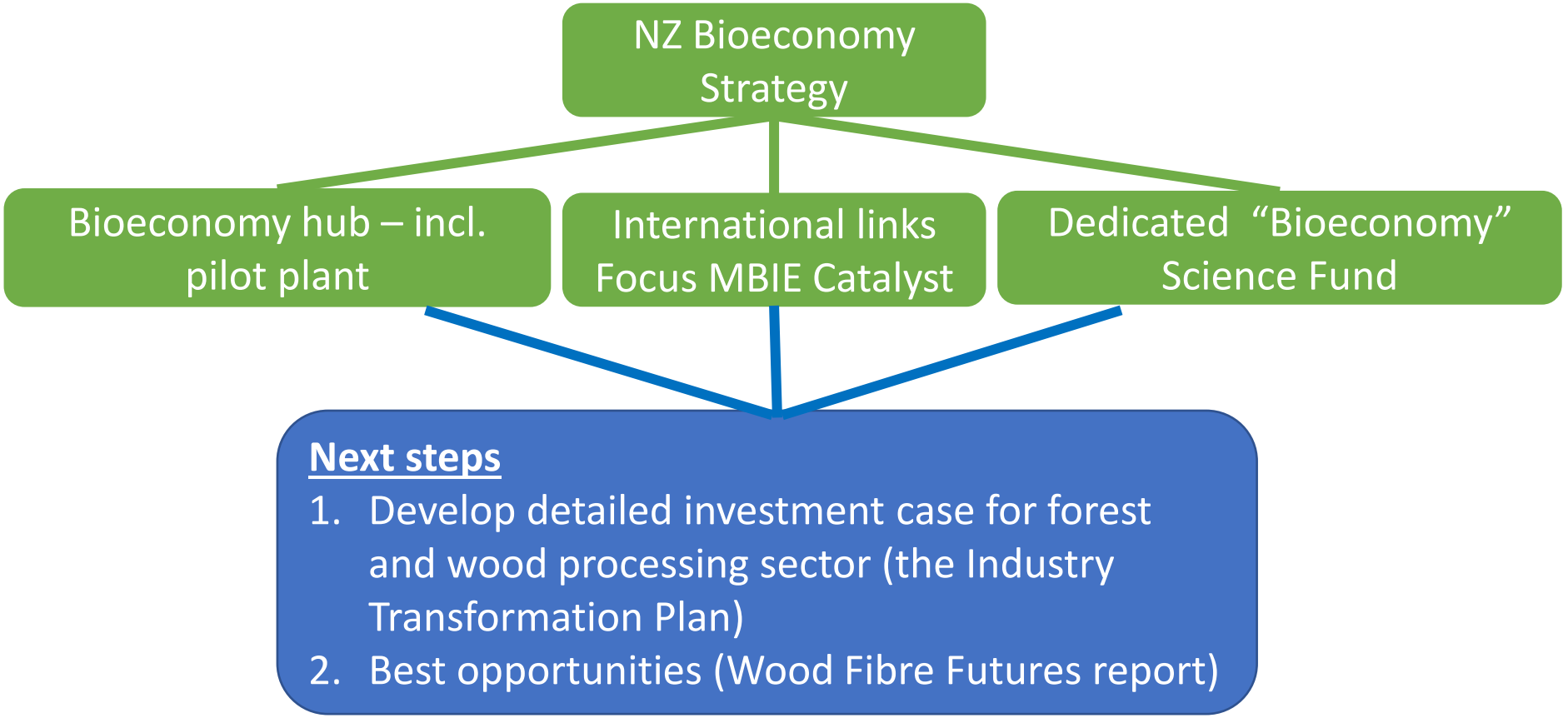
The energy used for regulating building temperatures accounts for 14% of the primary energy consumed in the U.S. One-quarter of this energy is leaked through inefficient glass windows in cold weather. The development of transparent composites could potentially provide affordable window materials with enhanced energy efficiency. Transparent wood as a promising material has presented desirable performances in thermal and light management. In this work, the performance of transparent wood is optimized toward an energy efficient window material that possesses the following attributes: 1) high optical transmittance (≈91%), comparable to that of glass; 2) high clarity with low haze (≈15%); 3) high toughness (3.03 MJ m^{-3}) that is 3 orders of magnitude higher than standard glass (0.003 MJ m^{-3}); 4) low thermal conductivity (0.19 W m^{-1} K^{-1}) that is more than 5 times lower than that of glass. Additionally, the transparent wood is a sustainable material, with low carbon emissions and scaling capabilities due to its compatibility with industry-adopted rotary cutting methods. The scalable, high clarity, transparent wood demonstrated in current work can potentially be employed as energy efficient and sustainable windows for significant environmental and economic benefits.

particular account for 10–25% of the heat loss due to their poor thermal management capability,[3] with ≈3.95 quads (or 1.16×10^{12} kWh) of primary energy consumed through windows in cold weather.[4] At present, glass is considered as the most commonly used window material. However, single-pane glass windows suffer from the following weaknesses. First, glass has a high intrinsic thermal conductivity (≈1 W m^{-1} K^{-1}), leading the energy required for heating to easily leak.[5] Second, glass is fragile and tends to break upon sudden impact, making it a safety hazard.[6] Moreover, massive CO_2 emissions of 25 000 metric tons per year are produced during glass production.[7] Exploring energy efficient window materials is thus highly desirable to address heating costs, energy shortages, and the global impact of climate change associated

https://www.fpl.fs.fed.us/documnts/pdf2020/fpl_2020_mi001.pdf

Position forest industry as central to future low C 'circular' bioeconomy

Position forestry and wood processing to play a large and complementary role in NZ's transition to a low carbon economy (meet Net Zero 2050)



Climate Change Commission reflects FMAG advice ……

Recommendation 15

4. Integrating considerations across the agriculture, building, energy, forestry, land, transport, and waste sectors (see relevant sector recommendations) including:
   a. Collating and publishing data on existing biomass resource supply and demand to identify potential regional supply chains.
   b. Introducing regulatory or investment settings that prioritise high value and emissions reduction uses for biomass resources.
   c. Evaluating the future value of the bioeconomy including as a source of fuels, construction materials, other products, employment and economic opportunity.
   d. Creating an environment that enables research and innovation to drive a valuable future bioeconomy (consistent with Recommendation 13 on innovation, finance, and behaviour change).

Recommendation 14

Increase the circularity of the economy

We recommend that, in the first emissions reduction plan, the Government commit to:

Developing and delivering a long-term strategy to move Aotearoa to a more circular economy.

This should include:

1. Acting in partnership: To be enduring, the strategy must be created in partnership with Iwi/Māori, give effect to the principles of Te Tiriti o Waitangi/The Treaty of Waitangi, and align with the He Ara Waiora framework. Consideration should also be given to:
   a. How to embed a complementary mātauranga Māori approach in the strategy (see also Recommendation 26 on equitable and proactive partnership with Iwi/Māori).
   b. Enabling Māori-collectives to participate in associated business opportunities.
2. Prioritising and investing in data collection to support measurable indicators to enable monitoring of progress towards circularity and the impact on emissions.
3. Providing a clear governance structure, including tasking a minister and lead agency to assess and implement actions for a more circular economy.
4. Setting up a mechanism that enables active collaboration with Iwi/Māori, local government and industry.

Recommendation 13

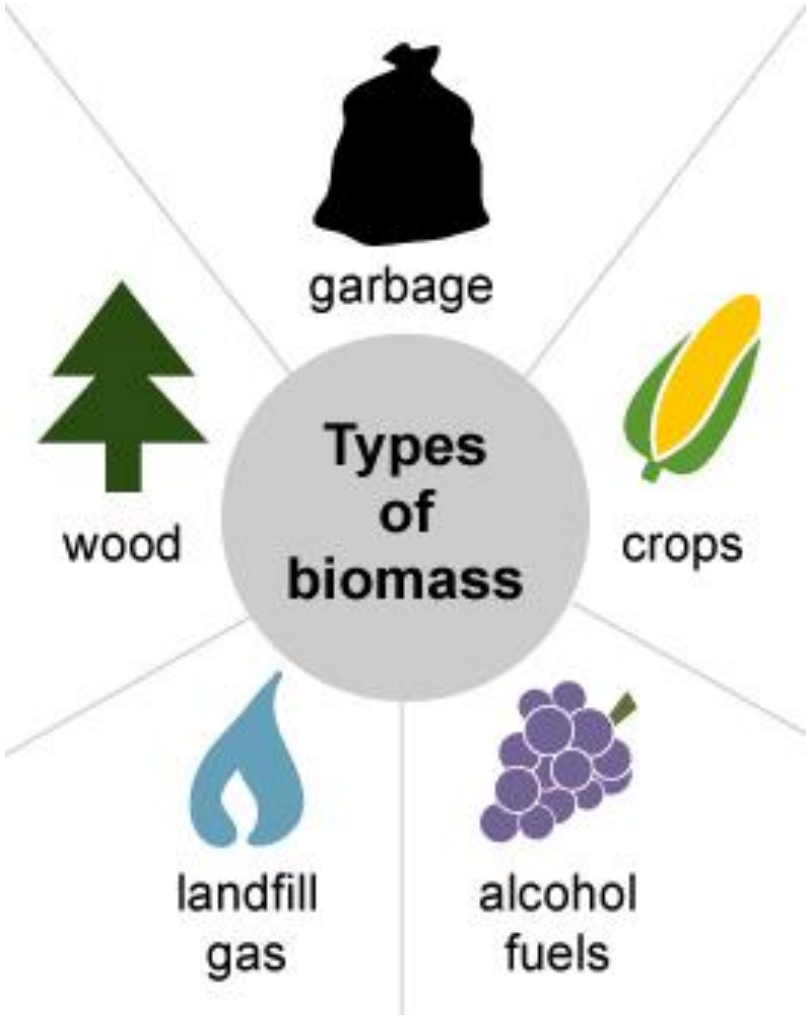
Enable system-level change through innovation, finance and behaviour change

We recommend that, in the first emissions reduction plan, the Government commit to:

Enabling system-level change in Aotearoa through innovation, finance and behaviour change

This should include:

1. Accelerating the transition through innovation by:
   a. Giving high priority to low-emissions research, development and innovation within public science and innovation funding approaches. This should include support for research, development and innovation that draws on mātauranga Māori.
   b. Introducing targeted measures to support low-emissions research, development and innovation. This could include tax incentives, research grants and intellectual property regulations, and must include mechanisms to enable Māori-collectives and researchers to equitably benefit.



A bioeconomy means?

"The sustainable production and conversion of [renewable] biomass, for food, health, fibre and industrial products and energy" Schmit et al. Bio-based and Applied Economics 1(1): 47-63, 2012

- i.e. reduce or replace fossil oil

NZ does not [yet] have a bioeconomy strategy

Germany's bioeconomy strategy

https://biooekonomie.de/en/bioeconomy-germany-background

Market as well as regulatory drivers for transition

Market access

Science-direct targets

ESG investment criteria

Taskforce for Climate Disclosures Framework

Forestry Ministerial Advisory Group

Requirements for data collection purposes			Requirements for modelling purposes								
Activity data to be collected	**Specific requirements (e.g. frequency, measurement standard, etc)**	**Unit of measure**	**Default dataset to be used**	**Dataset source (i.e. node)**	**UUID**	**Default Data quality parameters**					**Remarks**
						TiR	**TeR**	**GR**	**P**	**DQR**	
Inputs											
GRAPE PRESSING											
Organic grapes consumption	actual measurement	kg	Grape, full production (phase), organic, variety mix, Languedoc-Roussillon, at v	http://eplca.jrc.ec.europa.eu/EF-node/	a5288d5e-f503-470b-8e28-99c1182a4e6e	na	na	na	na	na	Non EF-compliant
			Grape, early production (phase), organic, variety mix, Languedoc-Roussillon	http://eplca.jrc.ec.europa.eu/EF-node/	8dcbe172-0773-4eff-a11c-4654499fff0f	na	na	na	na	na	Non EF-compliant
			Grafted vine plant, nursery (phase), production and varieties mix, at tree nurse	http://eplca.jrc.ec.europa.eu/EF-node/	b2cde660-baaa-4922-a0a4-9d3c8b82c9bd	na	na	na	na	na	Non EF-compliant
			Grafted vine, plantation/destruction (phase), conventional	http://eplca.jrc.ec.europa.eu/EF-node/	bd2ff381-d701-4da1-8134-65edbf074818	na	na	na	na	na	Non EF-compliant
Conventional grapes consumption	actual measurement	kg	Grape, full production (phase), integrated, variety mix, Languedoc-Roussillon, a	http://eplca.jrc.ec.europa.eu/EF-node/	23046b41-a00d-499a-9ce5-653669cf6cbd	na	na	na	na	na	Non EF-compliant
			Grape, early production (phase), integrated, variety mix, Languedoc-Roussillon,	http://eplca.jrc.ec.europa.eu/EF-node/	9c9a58da-4216-4bc8-93eb-283f9c77a682	na	na	na	na	na	Non EF-compliant
			Grafted vine plant, nursery (phase), production and varieties mix, at tree nurse	http://eplca.jrc.ec.europa.eu/EF-node/	b2cde660-baaa-4922-a0a4-9d3c8b82c9bd	na	na	na	na	na	Non EF-compliant
			Grafted vine, plantation/destruction (phase), conventional	http://eplca.jrc.ec.europa.eu/EF-node/	bd2ff381-d701-4da1-8134-65edbf074818	na	na	na	na	na	Non EF-compliant
Lorry: mass transported	actual measurement	kg	Articulated lorry transport, Total weight >32 t, mix Euro 0-5 diesel driven, Euro 0 - 5 mix, cargo consumption mix, to consumer more than 32t gross weight / 24,7t payload capacity	http://lcdn.thinkstep.com/Node/	328984f2-4a54-419a-b88a-5426a75d0b27	1	1	3	2	1	EU-28+3
Lorry: transport distance	actual measurement; default value: 25 km	km									
Lorry: utilisation ratio	default value: 64%	%									
Electricity consumption	Default value: 0,0056	KWh/kg	Residual grid mix AC, technology mix consumption mix, to consumer 1kV - 60kV	http://lcdn.thinkstep.com/Node/	SELECT COUNTRY-SPECIFIC FROM LIST BELOW*						
WATER AND ENERGY CONSUMPTION											
Water consumption	yearly average	m3/year	Tap water; technology mix; at user; per kg water	https://lcdn.quantis-software.com/PEF	212b8494-a769-4c2e-8d82-9a6ef61baad7	2.4	2.0	2.0	2.0	2.1	EU-28+2
Electricity consumption	yearly average	MJ/year	Residual grid mix AC, technology mix consumption mix, to consumer 1kV - 60kV	http://lcdn.thinkstep.com/Node/	SELECT COUNTRY-SPECIFIC FROM LIST BELOW*						
Fuel consumption (gasoil)	yearly average	MJ/year	Diesel mix at refinery from crude oil production mix, at refinery 10 ppm sulphur, 7	http://lcdn.thinkstep.com/Node/	da248653-790b-44bf-9e43-d4ae66cafbe1	1	1	1	2	1	EU-28+3
MATERIALS AND INGREDIENTS CONSUMPTION											
Ammonium bisulphite	actual measurement	kg/year	Ammonium sulfate, as N as N at plant, aggregated inputs per kg N	http://lcdn.blonkconsultants.nl	c7e491fa-901e-4fe0-bd97-b892de71cbd4	1.9	1.6	1.9	2.1	1.9	EU-28+3
Ammonium sulphate	actual measurement	kg/year	Ammonium sulfate, as N as N at plant, aggregated inputs per kg N	http://lcdn.blonkconsultants.nl	c7e491fa-901e-4fe0-bd97-b892de71cbd4	1.9	1.6	1.9	2.1	1.9	EU-28+3
Arabic gum	actual measurement	kg/year	Pea protein concentrate; aggregated inputs technology mix, production mix at pl	http://lcdn.blonkconsultants.nl	e2d014e9-d301-4911-8b07-3fd2db542bb8	2.1	1.7	2.0	2.4	2.1	EU+28
Ascorbic acid (vitamin C)	actual measurement	kg/year	Ascorbic acid production technology mix production mix, at plant 100% active s	http://ecoinvent.lca-data.com/	2a7985b0-bf14-40ff-bf5b-70536980ce87	1	2	1	2	2	RER
BARRELS FOR AGEING (IF APPLICABLE)											
Barrel	actual measurement	kg/year			-						DATA GAP
Oak industrial wood - barrel	actual measurement	kg/year	Sawn wood, hardwood; planed, dried; at plant; per kg sawn wood	https://lcdn.quantis-software.com/PEF	79726212-0bf2-40b9-9e71-fdbc601ec1e6	2.02	2.02	2.02	2.02	2.02	EU-28+3
Stainless steel - barrel	actual measurement	kg/year	Stainless steel quarto plate		{9933f558-aed2-45d6-b864-41542052262}						PROXY
TRANSPORT OF GRAPES, MATERIALS, INGREDIENTS AND BARRELS											
Lorry: mass transported	actual measurement	kg	Articulated lorry transport, Euro 4, Total weight >32 t (without fuel); diesel driven, Euro 4, cargo; consumption mix, to consumer; more than 32t gross weight / 24,7t payload capacity	http://lcdn.thinkstep.com/Node/	938d5ba6-17e4-4f0d-bef0-481608681f57	1.0	1.0	1.0	2.0	1.3	EU-28+3
Lorry: transport distance	actual measurement	km									
Lorry: utilisation ratio	actual measurement	%									
Lorry: empy return	actual measurement	yes/no									

Market access driver: EU PEF category rules

- Product Environmental Footprint (PEF) Category Rules and Organisation Environmental Footprint (OEF) Sector Rules
- Consistent, detailed method of calculating emissions, water and other resource use including production, processing, packaging and transport (example for wine (part)))

Source: https://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm

Danone –
adopts "science-based targets"

WENITA FOREST PRODUCTS

WHAT ARE SCIENCE BASED TARGETS?

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

The Science Based Target initiative is non-profit initiative led by the CDP, the World Resources Institute, the World Wildlife Fund and the United Nations Global Compact.

It helps companies to set and validate reduction targets in line with what climate science says, which is necessary to keep global warming below two degrees Celsius.

In 2015, Danone committed to setting Science-Based Targets. In 2017, our targets were validated, making Danone one of the first 100 companies to align its carbon reduction trajectory with the Paris Agreement.

Press Release – Auckland, New Zealand, July 30, 2019

Danone to invest NZ$40 million towards achieving 100% carbon neutrality of its South Island *Nutricia* spray drying plant

Leading global food company, Danone, today announced a NZ$40 million (approx. €25 million) investment in its *Nutricia* spray drying plant towards achieving carbon neutrality by 2021.[1] This significant, industry-leading milestone will be driven primarily by the installation of a NZ$30 million (approx. €17.5 million) state-of-the-art biomass boiler that will reduce the plant's CO_2 emissions by 20,000 tonnes per year.[2]

Danone's *Nutricia* spray drying plant is located at Balclutha, in the Otago region of the South Island. The plant processes raw milk sourced from eighteen local farms into powder that is used as the base for production of leading Infant Milk Formula (IMF) brands including Aptamil and Karicare.

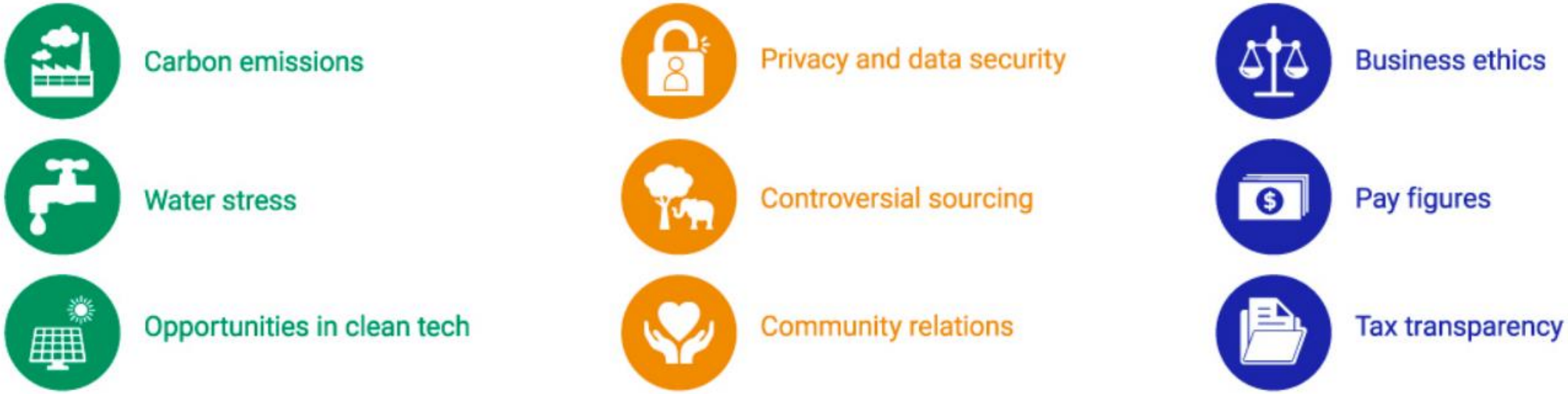
The world is transitioning to a zero-carbon economy. More than 1,000 businesses around the world are working with the Science Based Targets initiative (SBTi) to reduce their emissions in line with climate science.

MEET THE COMPANIES JOIN THEM

Cargill, Inc.	VIEW TARGET	Targets Set	2°C	United States of America (USA)	North America	Food and Beverage Processing	N
Corbion	VIEW TARGET	Targets Set	2°C	Netherlands	Europe	Food and Beverage Processing	S
Arla Foods	VIEW TARGET	Targets Set	2°C	Denmark	Europe	Food and Beverage Processing	A

Environmental, social and governance (ESG) driver

ESG strategies may consider the following key issues in the investment process, alongside financial factors:



https://www.visualcapitalist.com/fact-check-the-truth-behind-five-esg-myths/

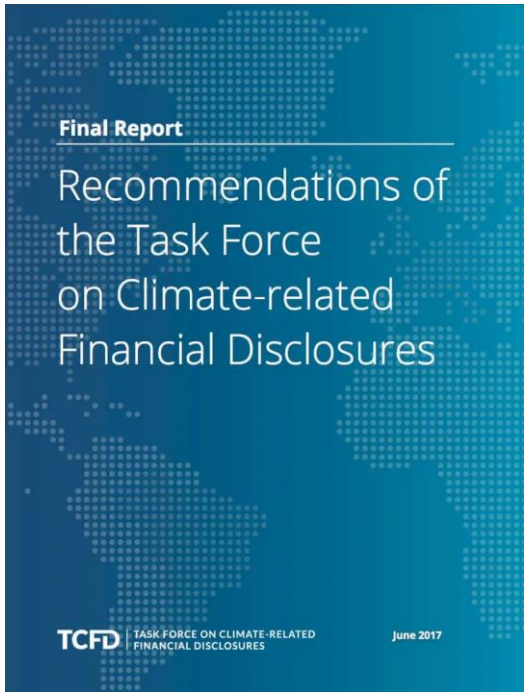
15 SEPTEMBER 2020

New Zealand first in the world to require climate risk reporting

Hon James Shaw

Climate Change

New Zealand will be the first country in the world to require the financial sector to report on climate risks, the Minister for Climate Change James Shaw announced today.



New reporting framework

Core Elements of Recommended Climate-Related Financial Disclosures

Governance

Disclose the organization's governance around climate-related risks and opportunities.

Find out more here

Strategy

Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.

Find out more here

Risk Management

Disclose how the organization identifies, assesses, and manages climate-related risks.

Find out more here

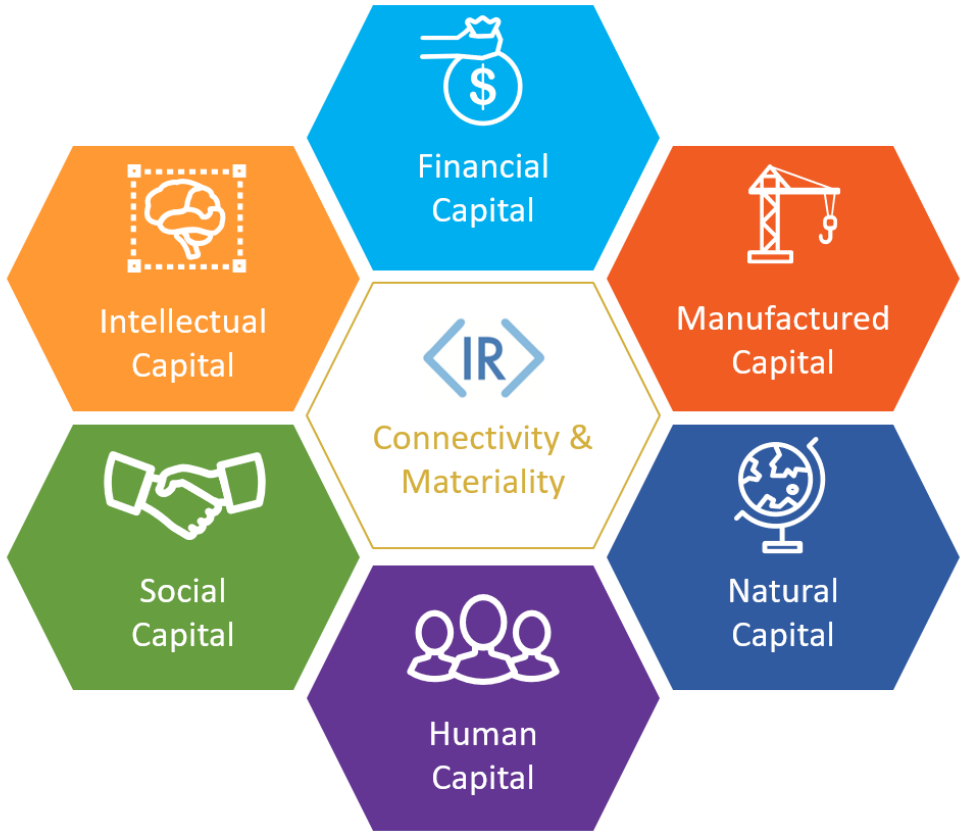
Metrics & Targets

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.

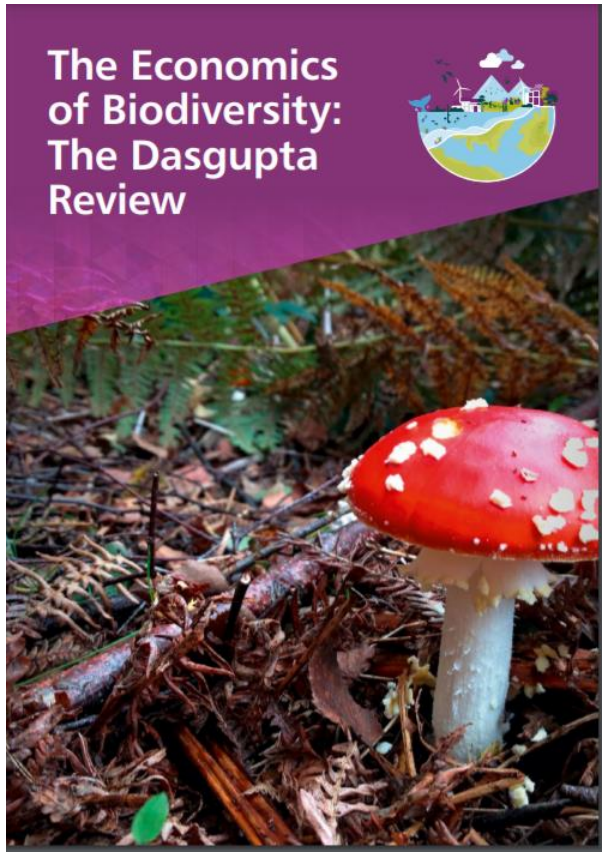
Find out more here

Webinar Directors' duties & liabilities around climate risk

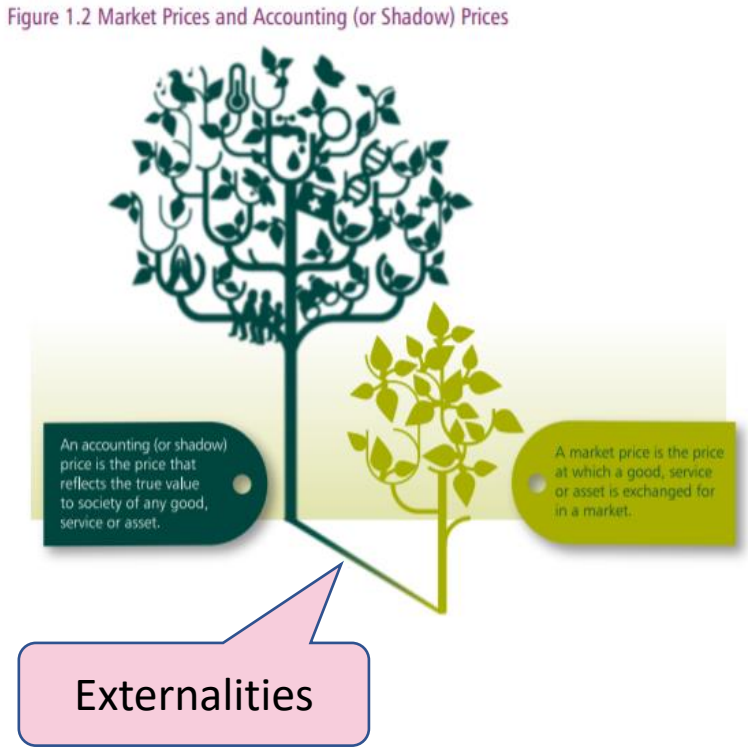
Why regeneration of natural capital matters and forestry's role in this?



Six capitals for integrated reporting
https://satriun.com/article/a-new-language-to-communicate-long-term-value-creation/



"We are facing a global crisis. We are totally dependent upon the natural world. It supplies us with every oxygen-laden breath we take and every mouthful of food we eat. But we are currently damaging it so profoundly that many of its natural systems are now on the verge of breakdown."



Forests [managed well] regenerate natural capital

Identifying economic and environmental complementarities between the dairy and forestry industries in the CNI

Warren Parker & Juan Monge

	Forest		Dairy	
Hectares	28,000		26600	grazable
Stocking	550	trees/ha	2.5	cows/ha
Yield/unit	650	m3/ha	380	kg MS/cow
Rotation	28	years	1	seasonal
Total yield	650,000	m3/yr	25,270,000	kg MS/yr
Ave price	90	$ m3	5.55	$ payout
Total income	58,500,000	$ to forest owner	140,248,500	$ to farmer
Net	35,100,000	$ stumpage	39,168,500	$ EFS
Product	64,760	t pulp	24,268,625	kg whole milk powder
	263,900	green timber m3		
Export price	875	Pulp $US/t	7.80	$NZ kg MS
	310	timber $/m3		
Export $	**172,929,436**		**189,295,273**	
Land value	10,000	$/ha	36,100	$/ha
Employment	>300	Kinleith	242	on farm
Nitrogen	140	tonnes/yr	1835	tonnes/yr
Phosphate	?		1290	tonnes/yr
Carbon (GHG)	1003	t stored/ha	6	t GHG/ha/yr emitted

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Riparian planting in plantation forests

Native forest barriers will be planted on New Zealand's East Coast .. to protect waterways against forestry slash and silt in future storms. East Coast landowner Aratu Forests has signed a 90-year agreement that gives environmental land use business eLandNZ the right to plant and manage areas that are no longer suitable for production forestry.

Source: https://www.gisborneherald.co.nz/local-news/20210531/forestry-game-changer/

Pinus radiata to indigenous species?

Source: Adam Forbes, PhD thesis, 2015, University of Canterbury, p.43

Site proximity to native species seed source, light through canopy, browsing

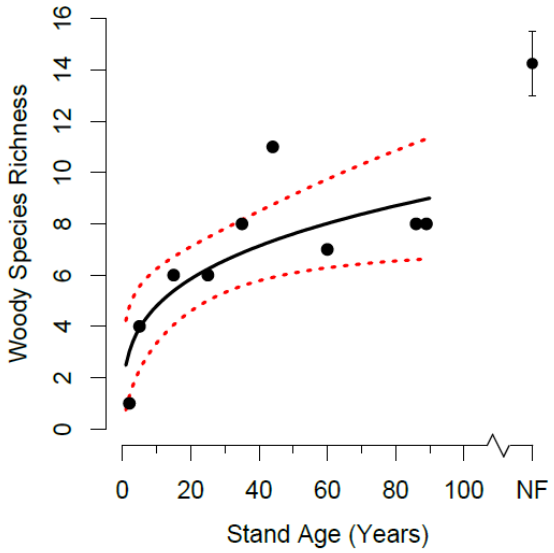


Figure 6. Predicted indigenous woody species richness (*S*) as a function of stand age and meso-scale topographic exposure, across a chronosequence of nine *Pinus radiata* plantation stands aged 2–89 years, Kinleith Forest, central North Island, New Zealand. For comparative purposes, the *S* from an old-growth natural forest ("NF") reference site is shown. Error bars = ±1SE; dashed lines indicate the 95% CI.

Carbon farmers bought swaths of NZ promising to create native forests — but researchers doubt it will work

Eloise Gibson · 05:00, Jun 23 2021

Pureki forest Trial Site, Pāmu farm, south of Rotorua

Why regional economies need to transition to contribute more to a net zero circular bioeconomy?

CCC view on regional jobs (p.177) – Taranaki, West Coast economies shifts coal, gas, dairy

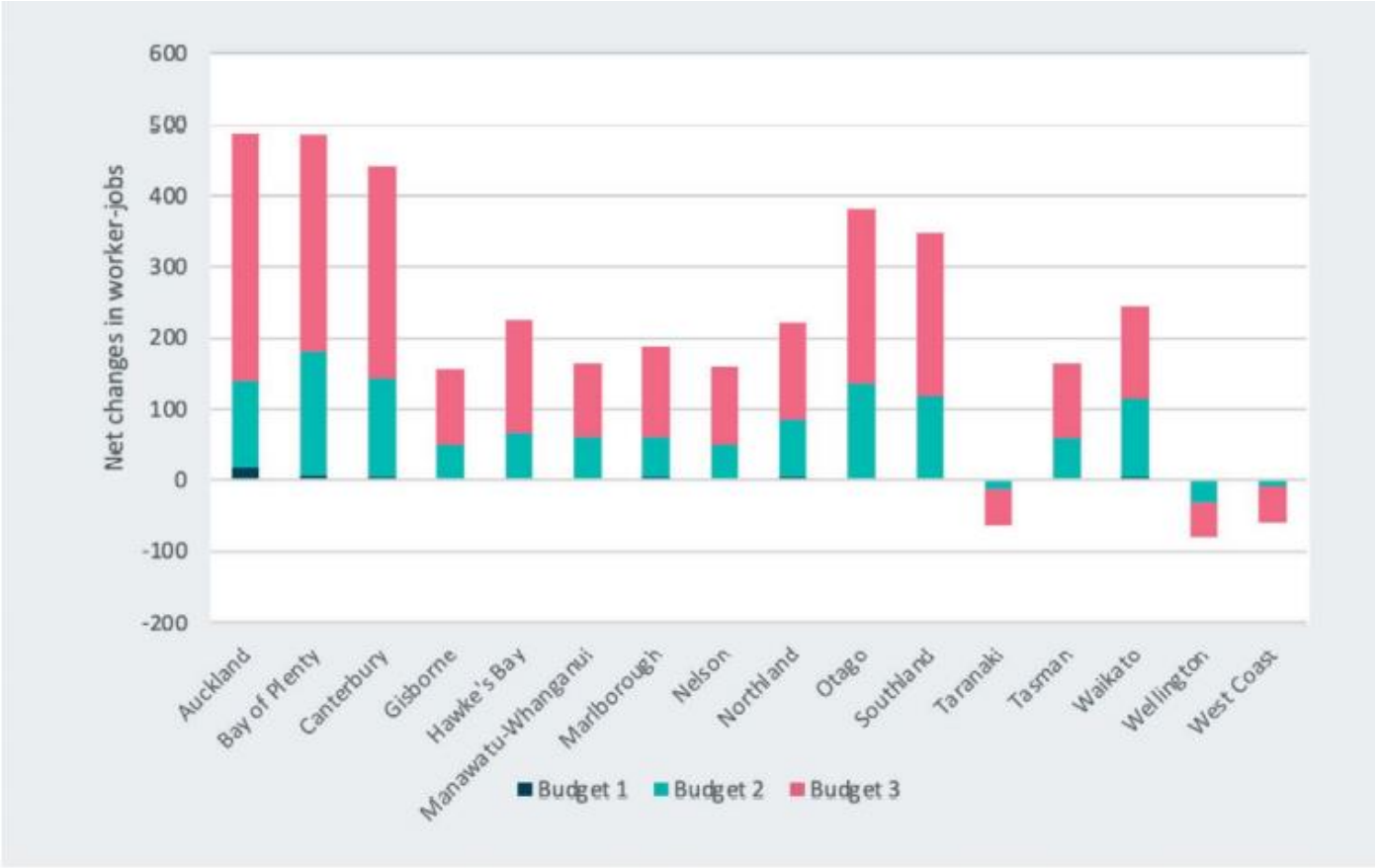


Figure 8.8: The overall net change in jobs that our modelling estimates could occur in each region under the demonstration path relative to the Current Policy Reference case

Source: DIM-E simulation results

CCC budget
Forests expand by 2035

Exotics – 380,000 ha
Natives – 300,000 ha

- Native establishment cost $5b-$15b (repaid within several decades by C)
- 1.4 to 1.8m hectare marginal land, 740,000 ha could revert
- Exotic spp planting peaks 2030

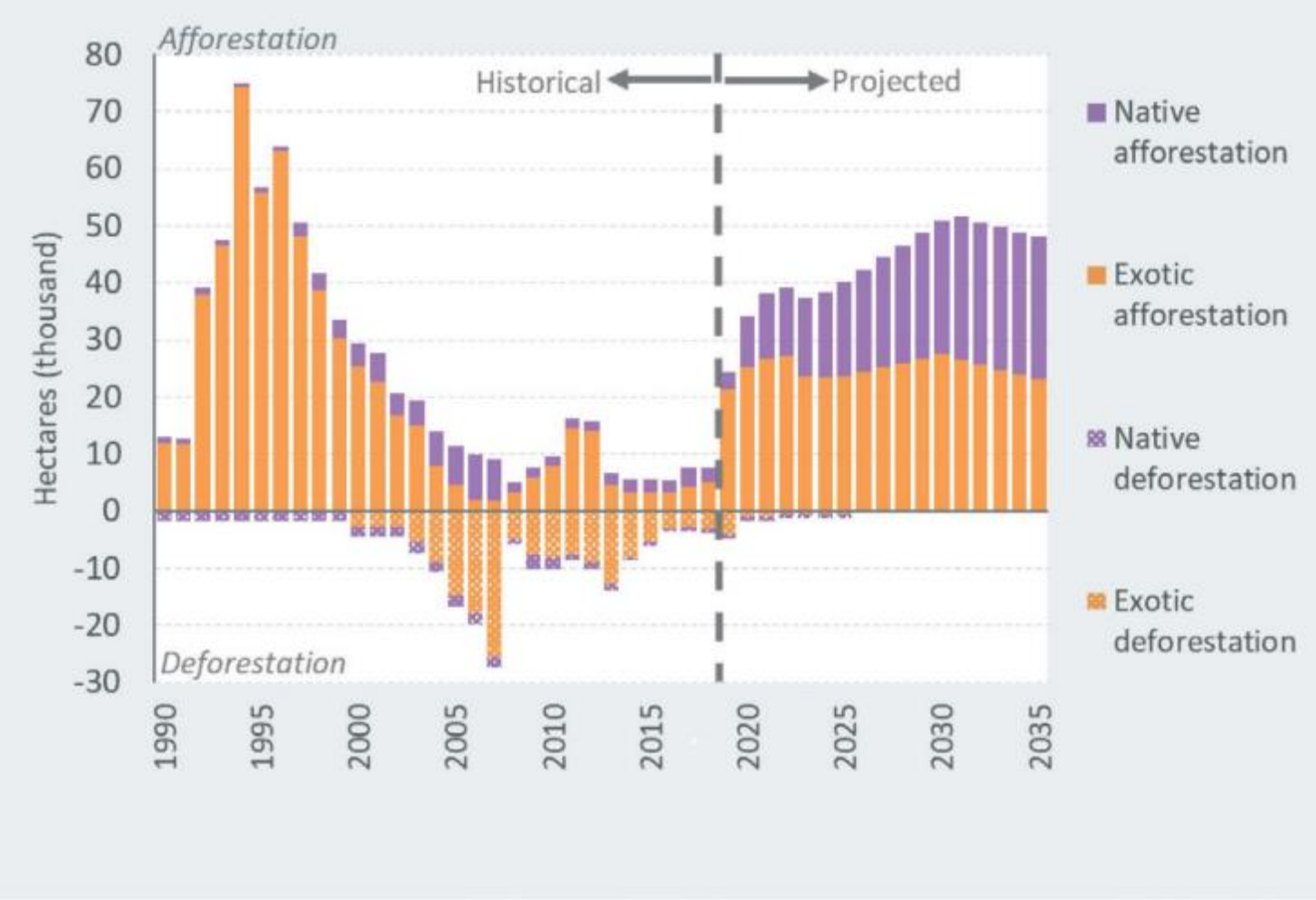
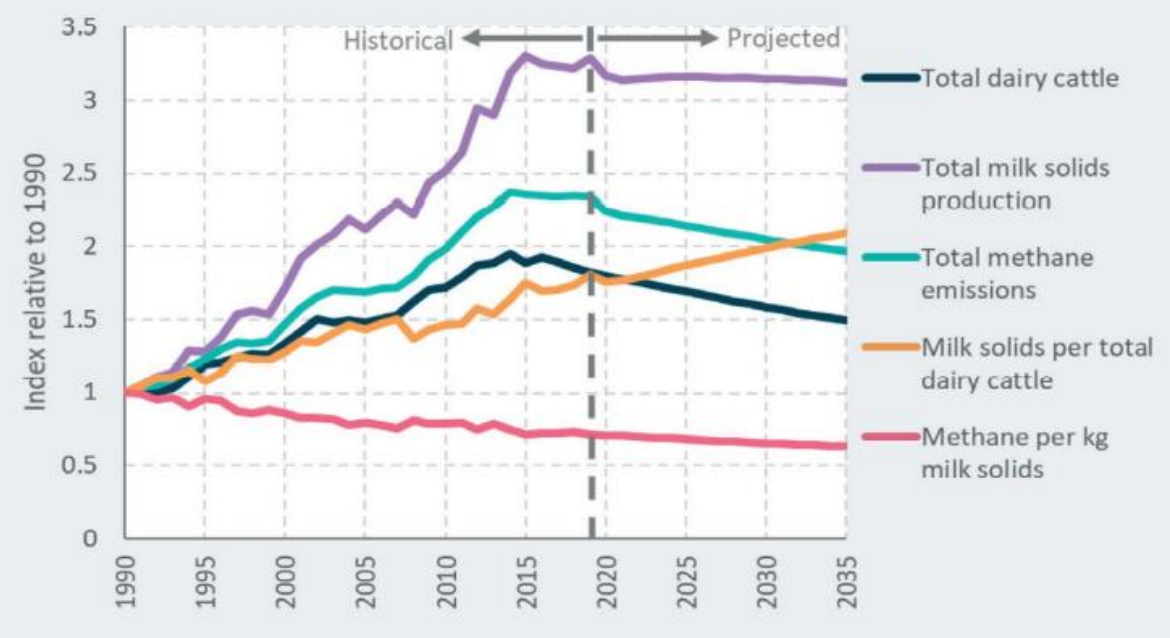


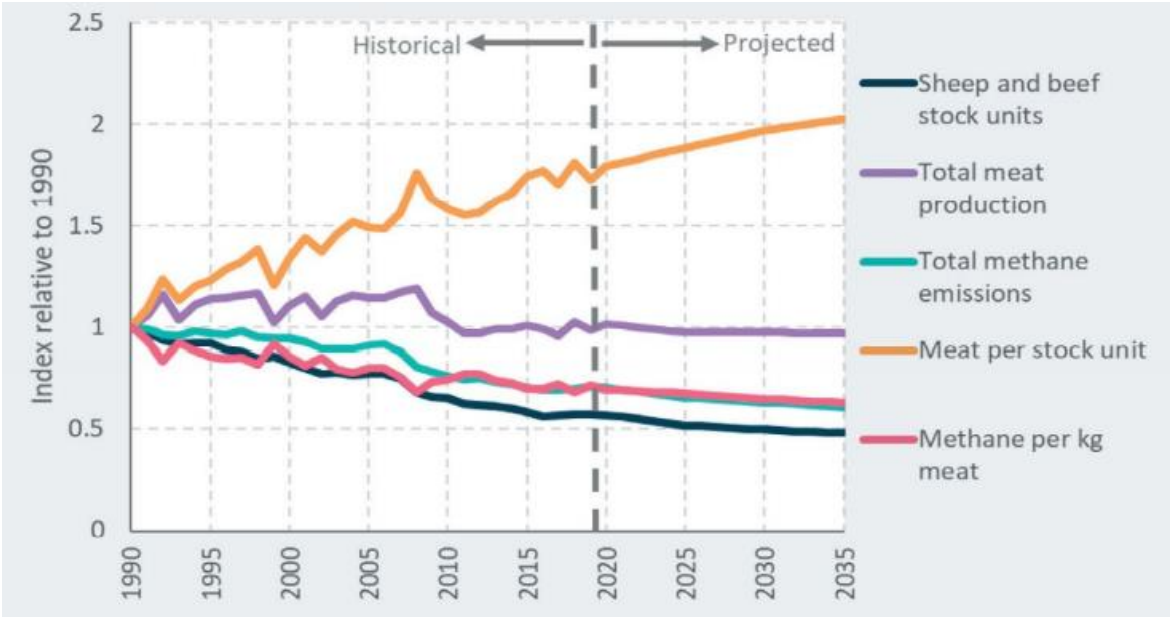
Figure 7.15: Afforestation and deforestation by year in the demonstration path

Source: Commission analysis

Climate Change Commission – livestock and dairy sector changes (Fig 7.13, p. 134)



Dairy – 13% fewer head by 2030 compared to 2019



Sheep & beef cattle – 13% fewer head by 2030

CCC budget
Forests expand by 2035
Exotics – 380,000 ha
Natives – 300,000 ha

- Native establishment cost $5b-$15b (repaid within several decades by C)
- 1.4 to 1.8m hectare marginal land, 740,000 ha could revert
- Exotic spp planting peaks 2030

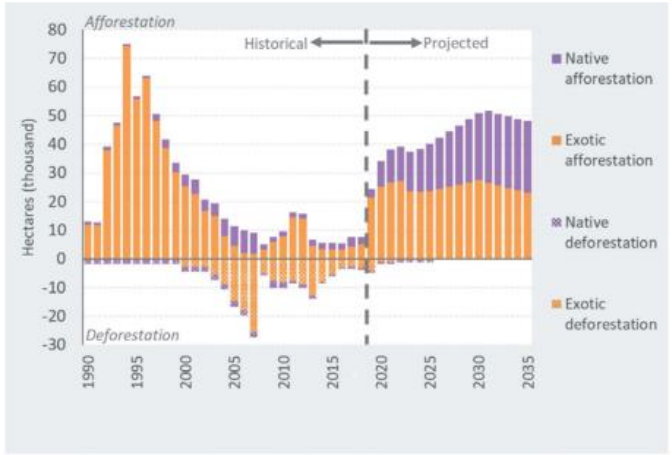
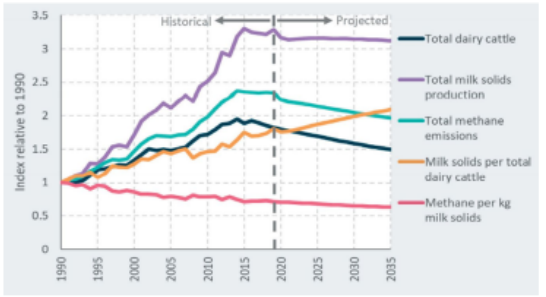


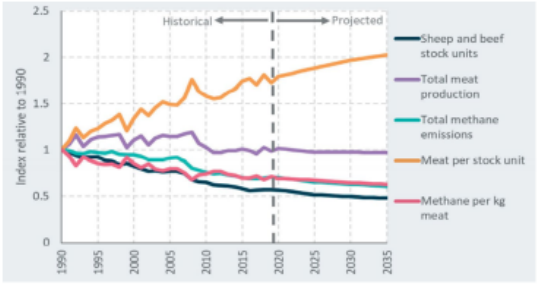
Figure 7.15: Afforestation and deforestation by year in the demonstration path
Source: Commission analysis

+

Climate Change Commission – livestock and dairy sector changes (Fig 7.13, p. 134)



Dairy – 13% fewer head by 2030 compared to 2019



Sheep & beef cattle – 13% fewer head by 2030

=

Land use, social and rural economy change

Sheep, beef cattle and grain farming job changes

There could be 3000 fewer jobs in these sectors by 2035 (p.176) or 2600 fewer jobs if action is taken as proposed by Commission (including jobs for native species – nursery etc, the bioeconomy (bioenergy) and wood processing....)

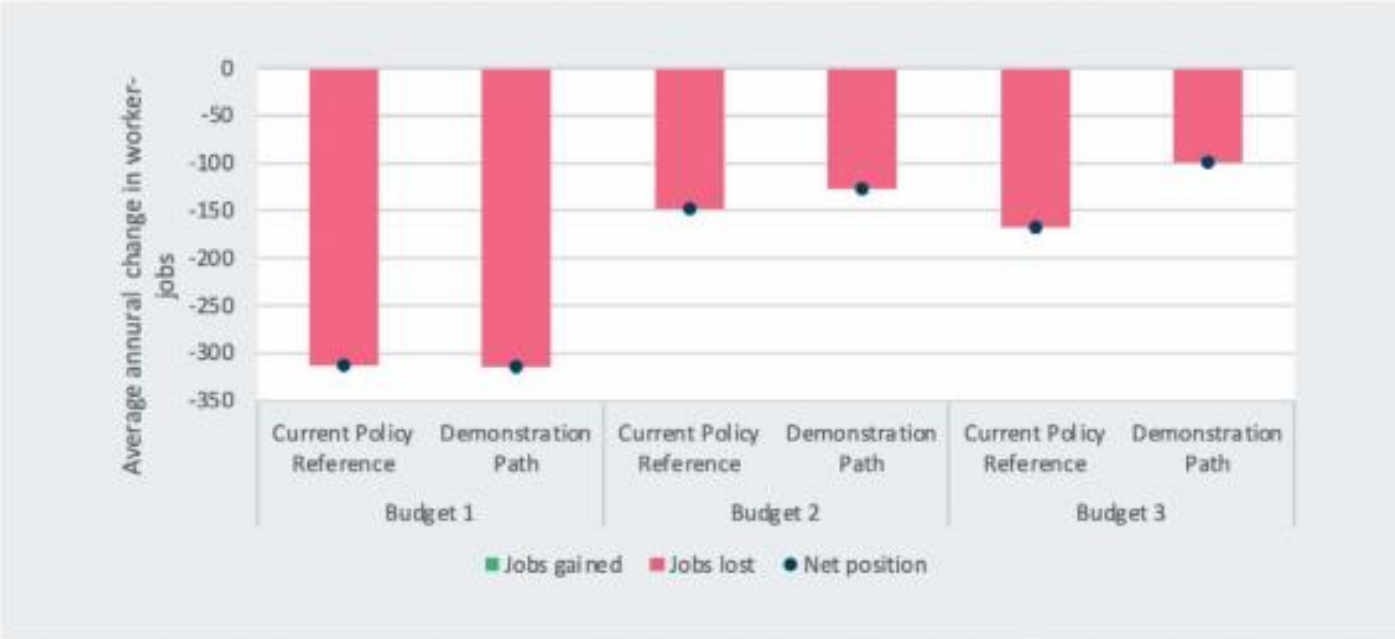


Figure 8.13: The average annual change in employment in sheep, beef and grain farming in each emissions budget period under the Current Policy Reference case and demonstration path

Source: DIM-E simulation results

Biomass for processing heat and fuel

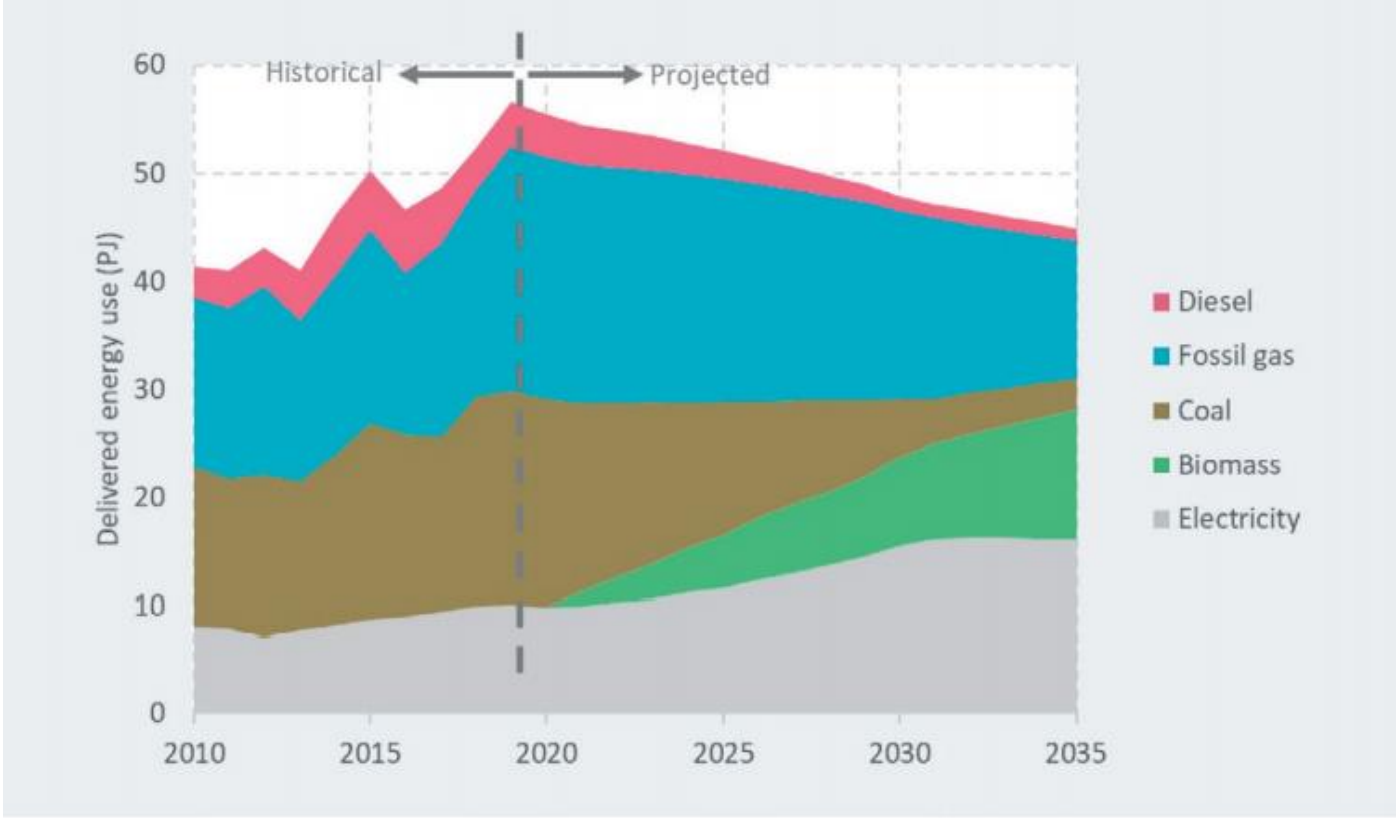


Figure 7.12: Food processing energy use in the demonstration path

Source: Commission analysis

COUNTRY

Fonterra to phase out coal use at Stirling cheese plant in Otago

11:18 am on 27 July 2021

Share this

Fonterra has announced plans to phase out the use of coal at its Stirling cheese plant in Otago by August next year.

Otago's Stirling plant will be coal free and using wood biomass to fire the site by August next year. …. Stirling [will be] Fonterra's first 100% renewable thermal energy site, …. Co-op's goal of [being coal-free] by 2037. ….wood biomass, [will reduce] the site's annual emissions by 18,500 tonnes of CO_2 [=7000 fewer cars].

- Pioneer Energy, Central Otago, will supply wood chips

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NZ's first food waste-to-bioenergy facility gets underway -

https://farmersweekly.co.nz/section/agribusiness/view/nzs-first-food-waste-to-bioenergy-facility-gets-underway

REPOROA

- Create enough energy to annually power up the equivalent of around 2500 households in the region, produce clean bio-fertiliser for 2000 hectares of local farmland, and provide carbon dioxide and heat to enhance the growth of tomatoes in T&G Fresh's local glasshouse.
- "The outcome is a carbon-neutral, circular economy solution," he said.
- "By revolutionising our reuse and recovery of this organic resource, each year the facility is expected to remove up to 10,000 tonnes of carbon dioxide – that's the equivalent of planting 218,400 trees every year."

Decarbonising freight

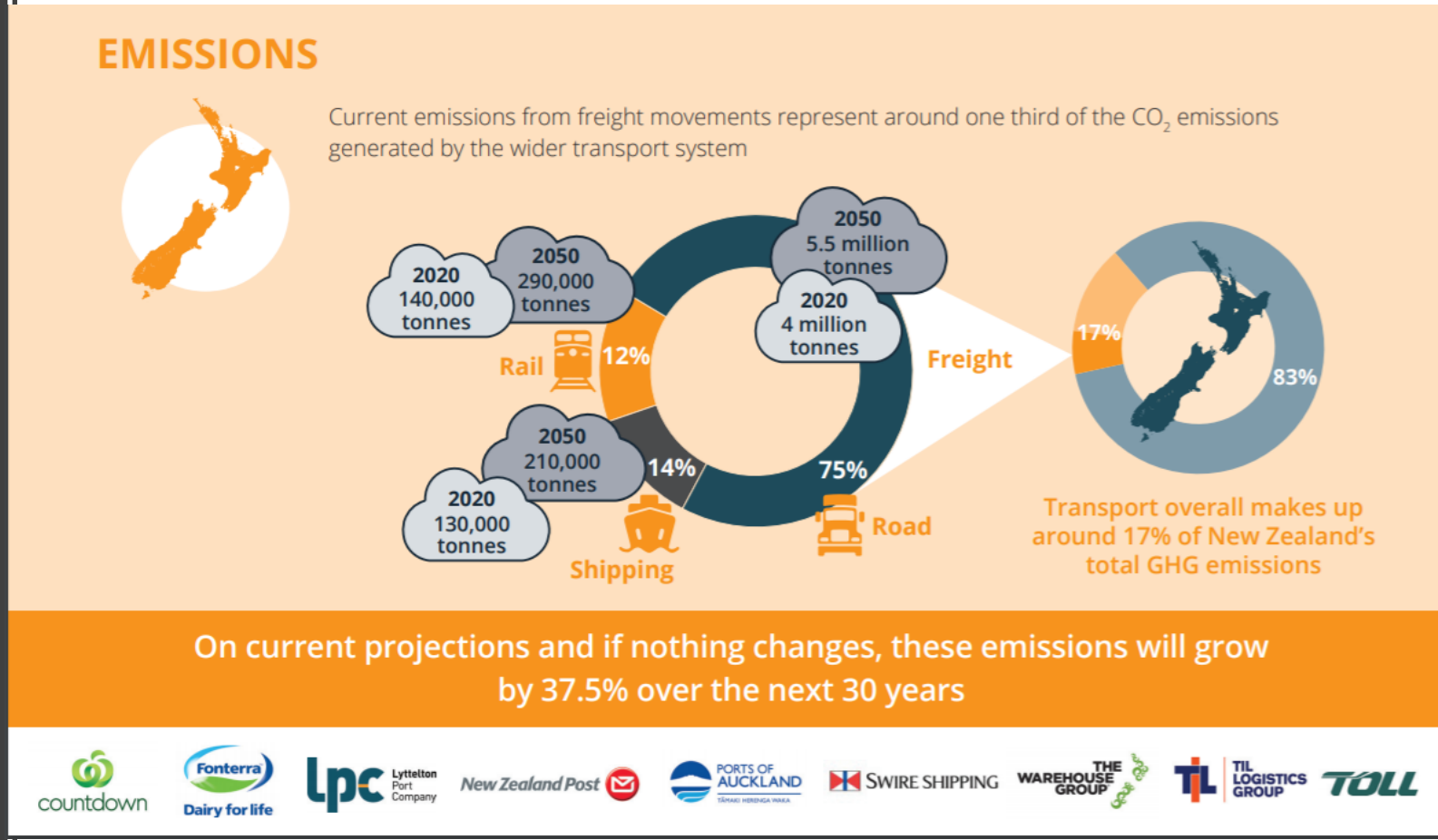
1. Reducing emissions by optimising the use of existing vehicles;

Then

2. Replacing fossil fuels with biofuels (adding 5% biodiesel reduces GHG by 4%);

Finally, as vehicles are retired,

3. Eliminating them by replacing them with zero carbon vehicles.



https://www.sbc.org.nz/media/sbc/our-word/low-carbon-freight-pathway-documents/Low-carbon-freight-pathway-factsheet.pdf

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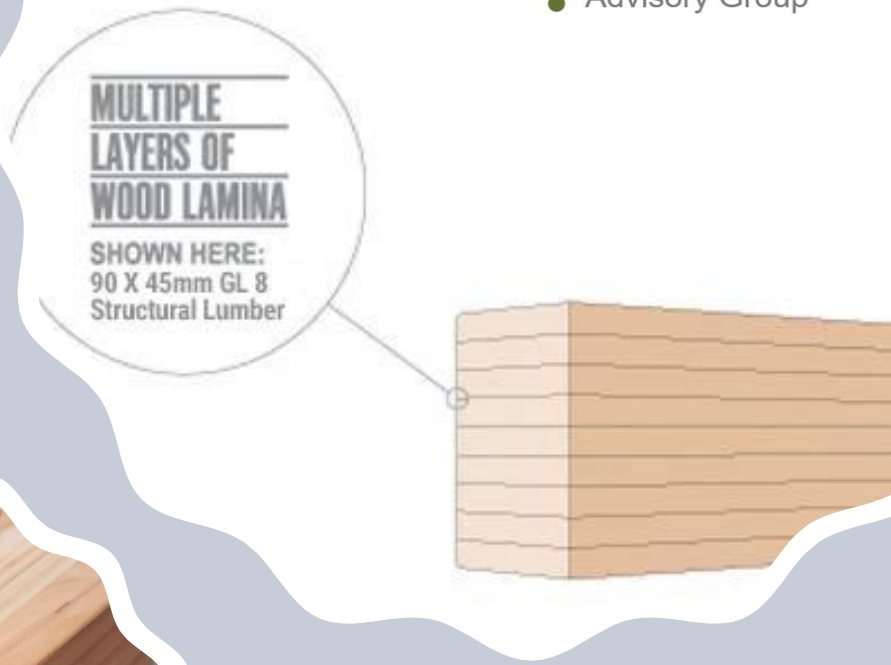
Optimised engineered lumber (OEL™) – WET

- Gisborne location: 6 production lines, up to 140,000 cubic meters of OEL™ per annum, and >130 jobs
- OEL™ is 40% stronger than non engineered timber
- OEL™ absorbs >900kg of CO_2e; same volume of concrete releases >400kg of CO_2e into the atmosphere.
- OEL™ is produced in a Net Zero Energy plant



Commodity levies collected by agriculture bodies

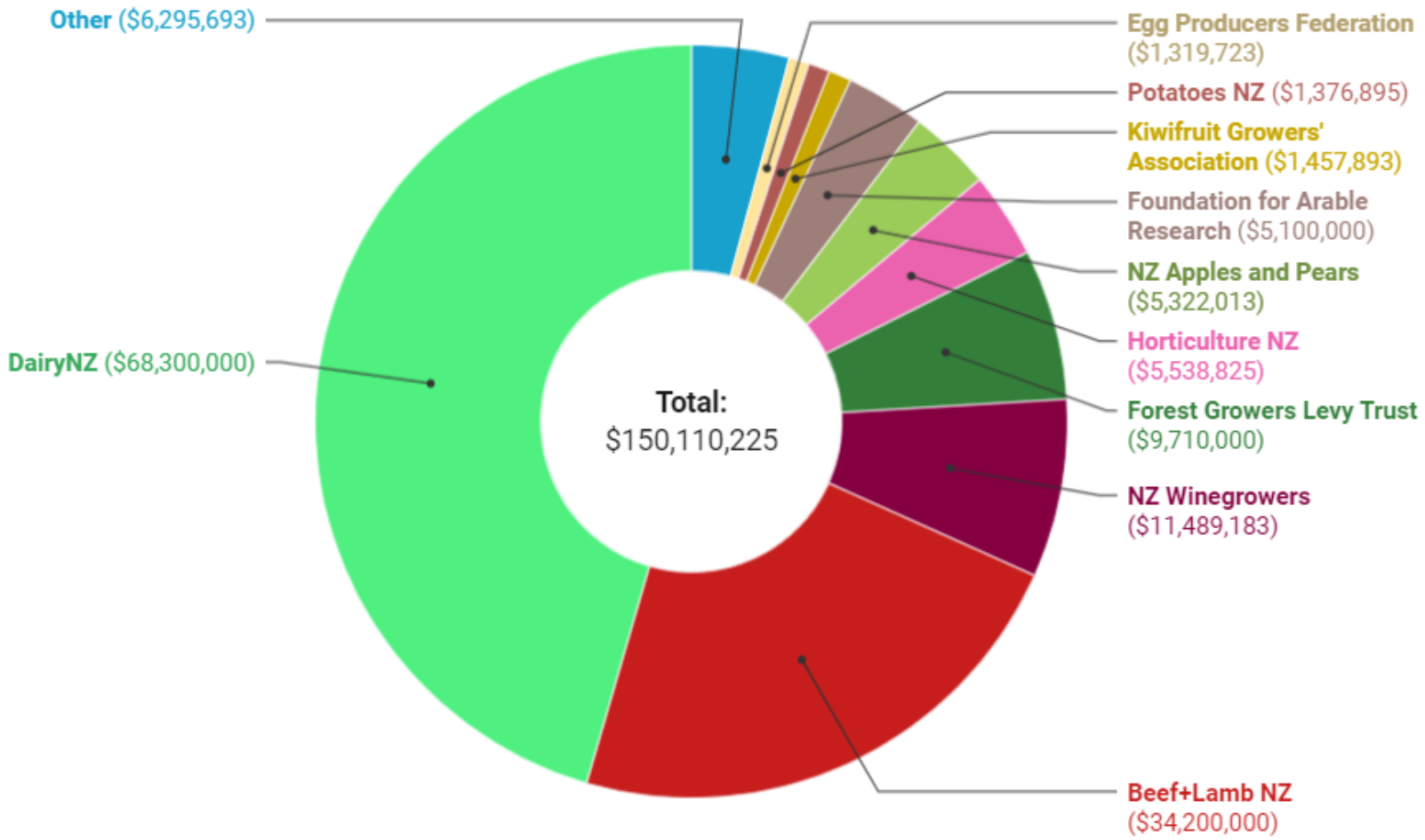


Chart: Newsroom Pro • Source: NZ Companies Office • Get the data • Embed • Download image • Created with Datawrapper

Summary – THREE QUESTIONS

1. Why re-position the NZ forest industry? Because its profile is poor and it needs to win “hearts and minds” of all NZers in order to play a central role in NZ transitioning to a net zero circular bioeconomy
2. Why regeneration of natural capital matters and forestry’s role in this? Because the economy is dependent on natural capital and it is currently being depleted and this is not sustainable; trees in the right place, for the right purpose and managed well restore capital
3. Why regional economies need to transition to contribute more to a net zero circular bioeconomy? Because traditional industries will get smaller and/or disappear and they need to be replaced by new climate friendly and small footprint new and/or repurposed industries such as biorefineries, bioenergy plants and monetised ecosystem services

Table 22.1: The amount of offshore mitigation needed under different NDC levels

NDC approach	Level (Mt CO_2e)	Implied quantity of offshore mitigation (Mt CO_2e)
2017 estimate of the current NDC	601	47
Latest estimate of the current NDC (-30%)	596	52
Middle of the IPCC interquartile range (-36%)	568	80
Lower quartile emissions IPCC pathways (-45%)	527	121

Developed countries (NZ) expected to take lead

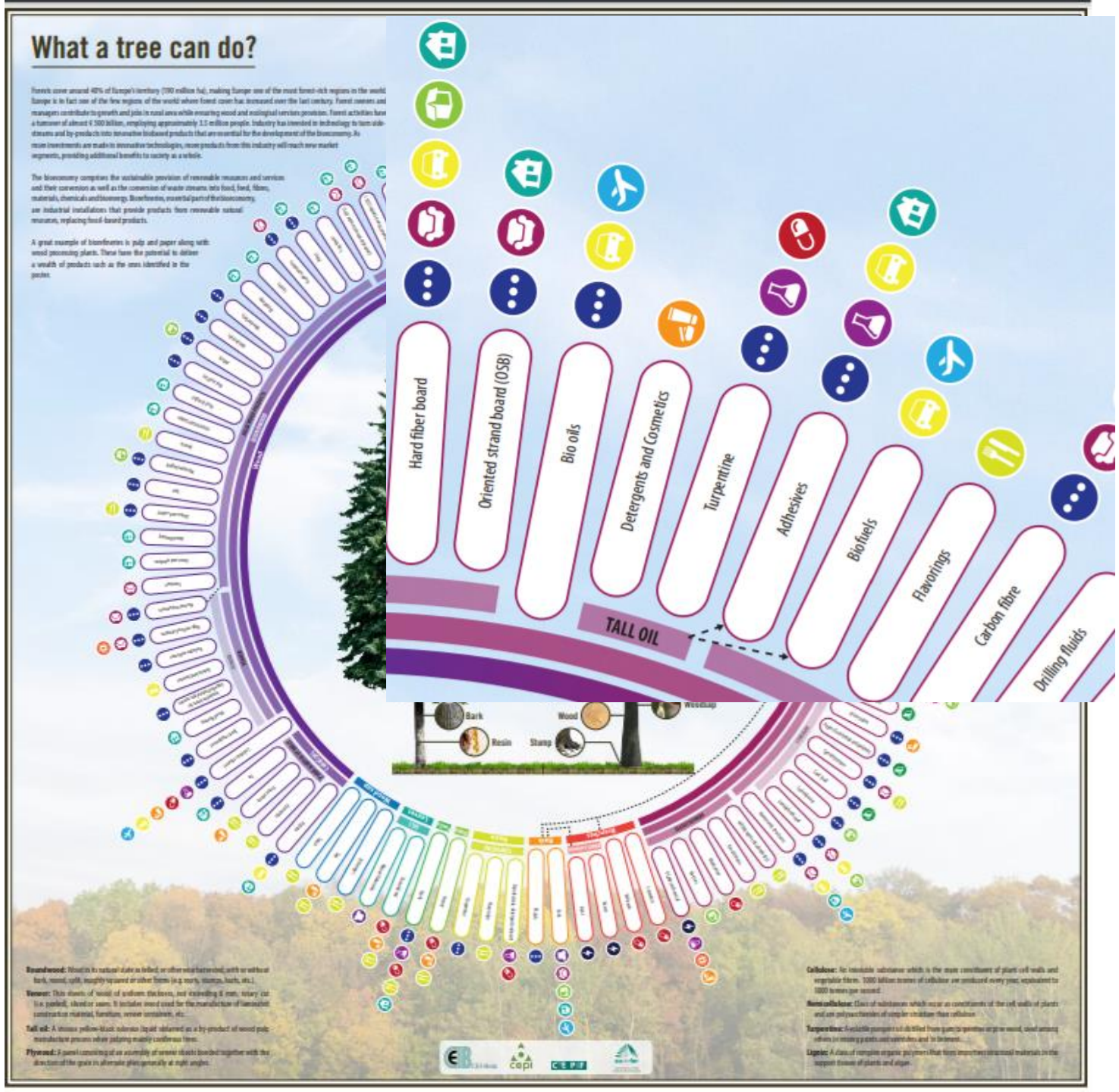
Table 22.2: Possible economic costs of offshore mitigation used to meet an NDC enhanced to 36% below 2005 emissions

	Price ($/tonne)		
Direct/indirect costs included	$30	$70	$140
Direct cost only	$2.4b	$5.6b	$11.2b
Direct + indirect costs	$4.3b	$10.1b	$20.2b

As well!! - NZ cannot 'reasonably' meet its Nationally Determined Contribution (NDC) commitment domestically and will need to invest offshore (essentially the cost of deforestation and limited new planting)

.. Offshore mitigation cannot be used to compensate for failure to implement domestic policies … only to bridge the gap between emission budgets and the NDC. (Section 22.4.2)

What a tree can do



Source: https://www.cepi.org/wp-content/uploads/2021/02/What-a-tree-can-do-final_compressed.pdf