

A stack of cut logs in the foreground, with a misty forest background. The logs are stacked in a way that shows their circular cross-sections, revealing the wood grain. The background is a soft-focus forest with a misty or foggy atmosphere, and a bright light source, possibly the sun, is visible through the trees, creating a lens flare effect.

# The future of forestry, carbon and natural capital: a New Zealand perspective

Warren Parker

The PAMU logo is a yellow circle with the text "PAMU" in black, bold, uppercase letters inside it.

PAMU™

# OVERVIEW

- Introducing Pāmu, C and ETS
- Forest context domestically, globally
- Land use change to forestry
- Natural capital – biodiversity, Nature repair or regenerative
- Social license pressures
- Exotic and native species relative profitability
- Policy settings: ‘Right tree, right place, right purpose’
- Take aways





## Pāmu – a State Owned Enterprise

- 112 farms – 358,866 ha
- \$290m revenue, \$59m EBITDAR
- \$2.359m total assets
- \$268m forestry, C and horticulture (70ha)



# Pāmu Forestry Estate (hectares)

## **Pāmu Estate** (Dec 2022)

Exotics	14,574
Natives	1,601
QEII/Reserves	9,885
<b>Total</b>	<b>26,060</b>

R. pine, D Fur, Eucalypts,  
Oak, Redwood

1500 hectares per year  
through to 2030

## **Pāmu Natives** (est. Dec 2022)

Production Timber	249
Commercial Manuka	750
Non-production (e.g. riparian)	602
<b>Total</b>	<b>1,601</b>

Beech, Totara,  
Kahikatea





# Forestry plantings designed into landscape to complement livestock and achieve “best” use of land



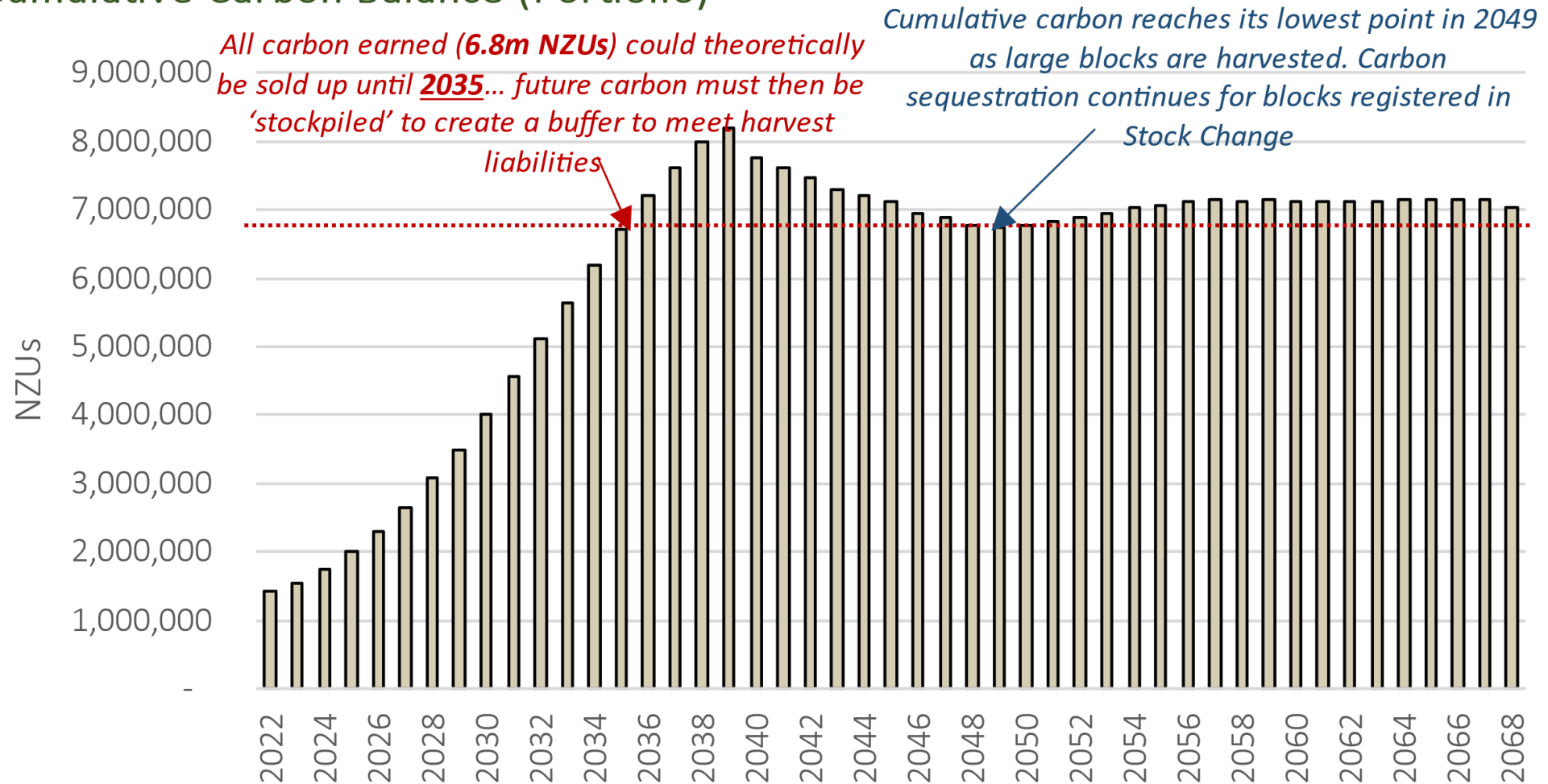
**Totara harvest, Pāmu farm, Northland (Feb 2022)**



**Radiata planting integrated into landscape to complement livestock operations**

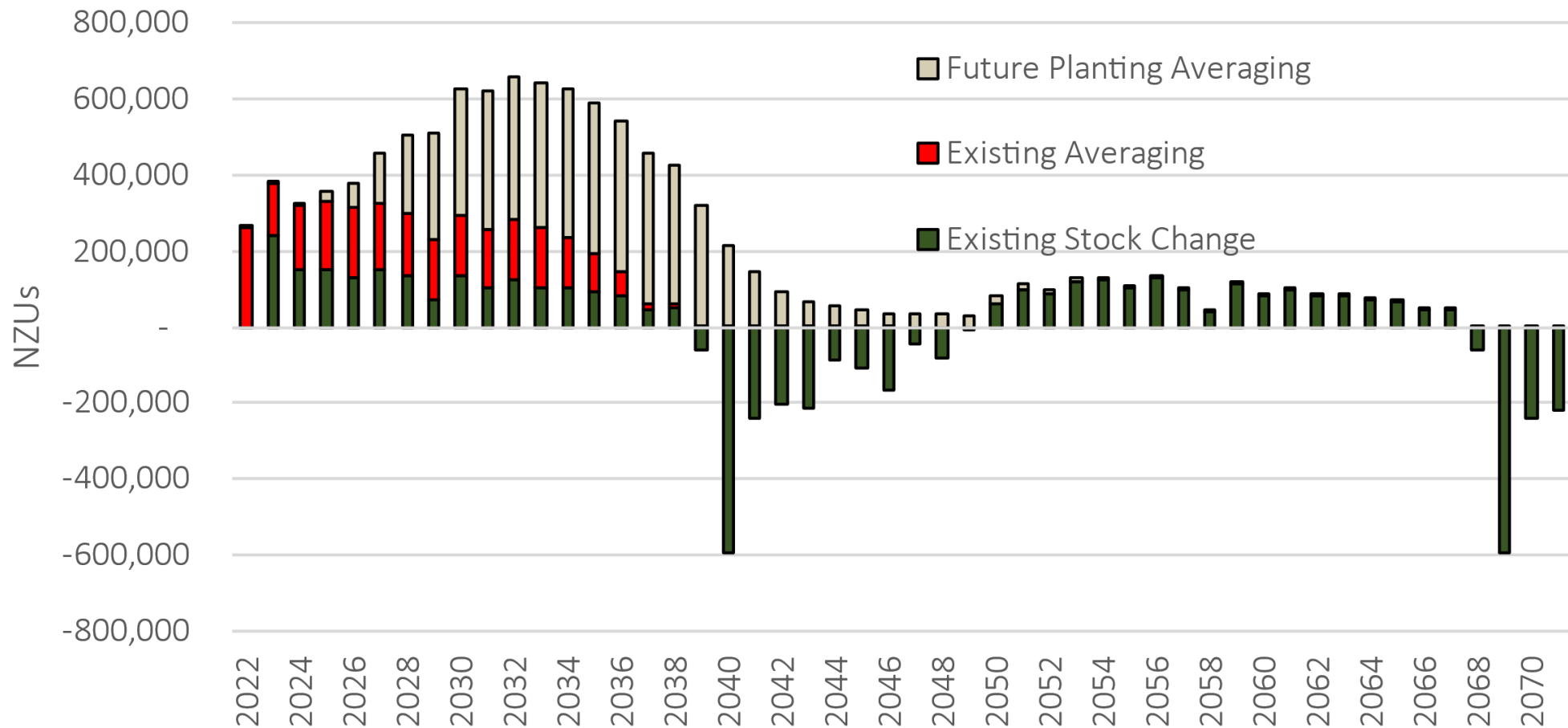
# Pāmu cumulative carbon balance illustrating asset value

## Cumulative Carbon Balance (Portfolio)



# Pāmu Carbon Portfolio reflects new plantings and ETS changes

## Annual Carbon Claimed/Surrendered (Portfolio)





# Building a portfolio of natural capital (ecosystem services) assets requires allocation of capital to this

- Sequestration of carbon
- Pollination (honey)
- Wind energy
- Solar energy
- Biodiversity
- Wetland (C,N, Biod)

*New Zealand Journal of Ecology* (2020) **44(2)**: 3412  
©New Zealand Ecological Society

## Economic valuation of the ecosystem services provided by Pāmu Landcorp farms

Research Article

Clint Cameron <sup>1\*</sup>, Joanna McQueen-Watton <sup>1</sup>, William Shaw <sup>1</sup>

<sup>1</sup>. Wildland Consultants, 99 Sala Street, PO Box 7137, Rotorua 3042, New Zealand

\* Corresponding author

DOI: <https://dx.doi.org/10.20417/nzjecol.44.19>

hectare<sup>-1</sup> year<sup>-1</sup>. Findings reveal that while Pāmu Landcorp's 'nonproductive' land comprises only 16.2% of total area, the net value of ecosystem services provided per hectare per year are 29.2% higher than productive land (\$1388 and \$1961 for 'productive' and 'non-productive' land, respectively). Additionally, while wetlands comprise only 0.8% of total land area, under this analysis they provide an estimated 8% of net total economic value, reflective of the higher values attributed to this ecosystem (\$14 208 ha<sup>-1</sup> yr<sup>-1</sup>). The valuation framework developed in the current study has

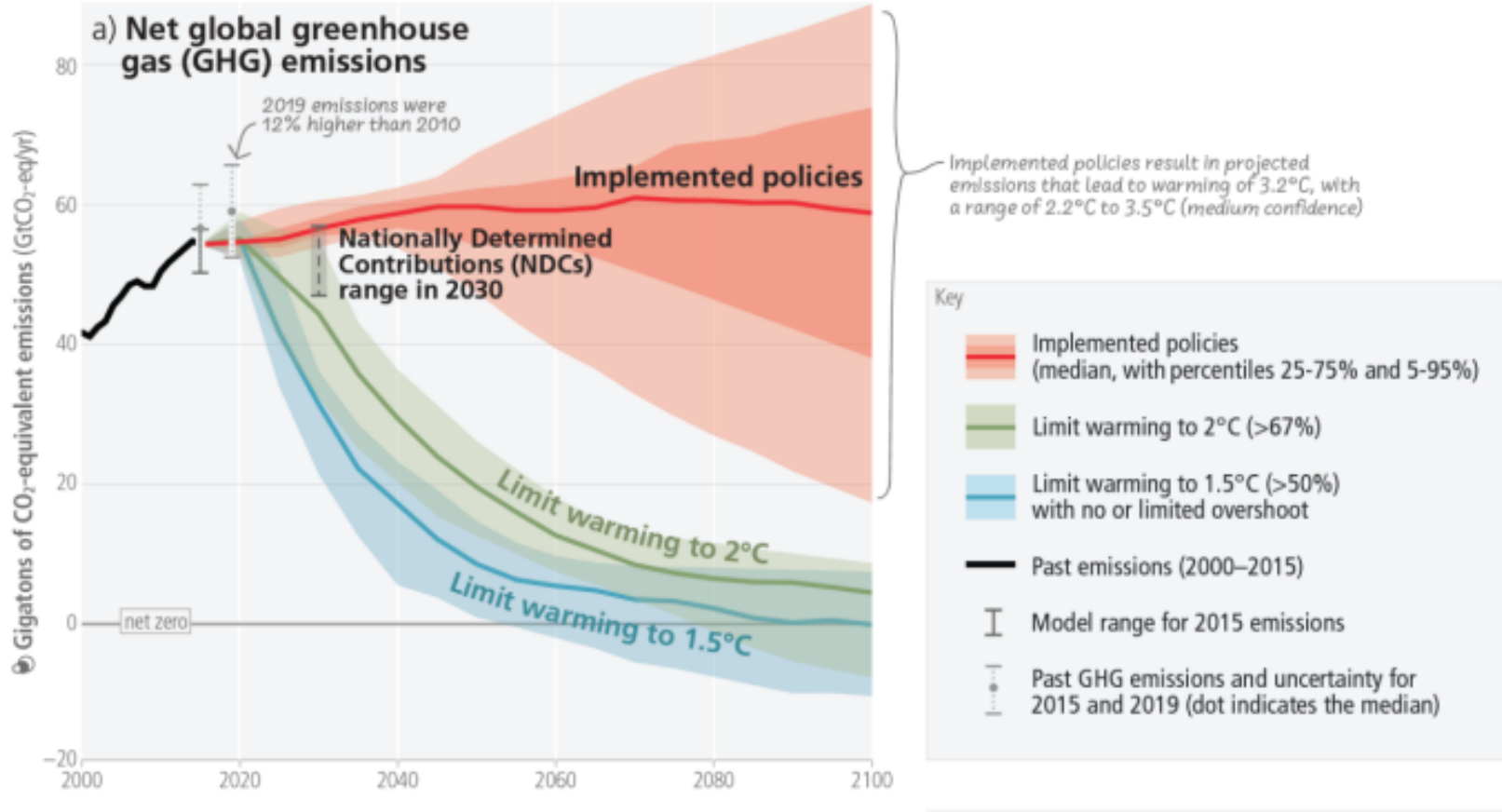




# Context: Forests vital to NZ meeting 2030 NDC and net zero 2050

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO<sub>2</sub> and net zero GHG emissions can be achieved through strong reductions across all sectors

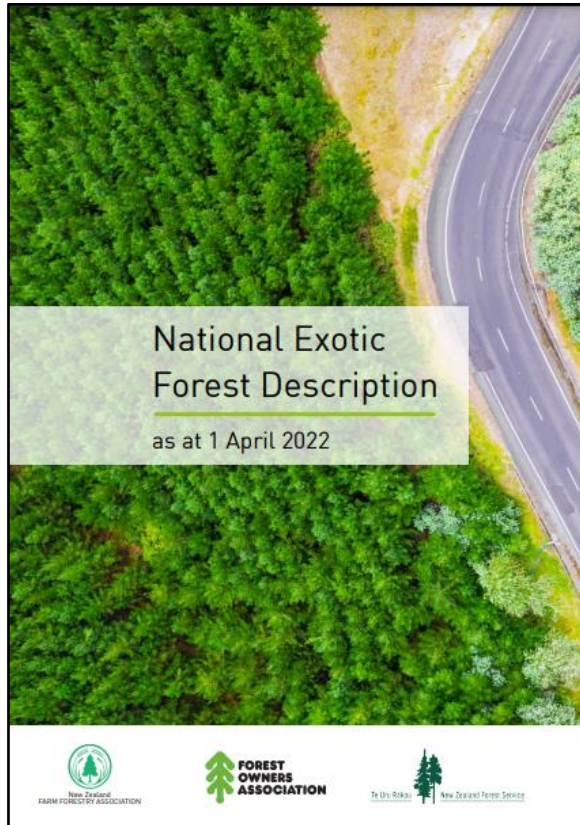


# Context: Globally forest area is declining and NZ is good at renewable plantation forestry

1. Global net deforestation is ca 4.4m ha/year
  - a) Australia bushfires 2019/20: 48,000ha pine plantation; Canada 2023: 15.3 m ha).
2. Spruce and Mountain bark beetle damage
  - a) 2017- 2019, more than 270 million m<sup>3</sup> of standing timber in Central Europe was damaged
  - b) 78 m ha of montane forest was lost 2001–2018
3. Global demand for timber/wood fibre is forecast (FAO/others) to increase 350% by 2050 (vs 70% for food)
4. NZ can grow renewable plantations 25-35years vs >100 yrs for northern hemisphere.



# Plantation forestry is 6.5% of NZ's land area (26.6m hectares) & increased net ca. 40,000 ha 2008 to 2021



## Key facts as at 1 April 2022



**1.76**  
million hectares  
planted in production  
forest (up from 1.74)

**18.6**  
years  
average forest standing  
age (up from 18.3)



**549** million  
cubic metres  
planted forest standing  
volume (up from 531)



**45,000**  
hectares  
new planting estimate for the  
year ending 31 December  
2021 (up from 34,000)



## Land-use change from pastoral farming to large-scale forestry Update

July 2023

Orme & Associates Limited



## “Statistics, lies and damn lies”

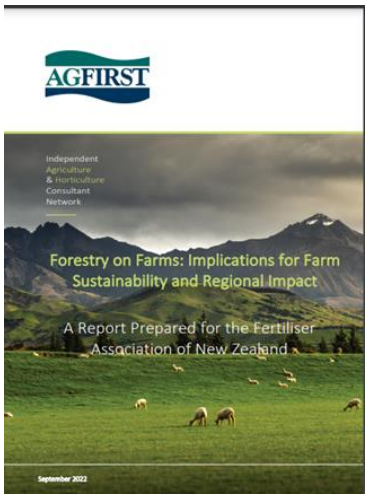
- Beef + Lamb NZ reports – 210,000 hectares land use change from pastoral to ‘forestry’ 2017 to 2022
- NEFD survey – 40,000 ha new plantation forest relative to 2008
- 89% Land Use Capability Class 6 & 7 (steep, v. steep)
- Opposed to whole farm conversions, loss of community services (rural depopulation) and ‘offsetting with no reduction in gross GHG’

Whole of Farm Purchase	Year				Updated 2021	Updated 2022	Grand Total (Hectares)	Overall % by Conversion
	2017	2018	2019	2020				
Honey (Mānuka) Forestry	3,039	7,340	1,678	3,313	3,175	274	18,819	8.9%
Carbon Forestry OIO	1,455	8,982	10,626	15,261	28,112	12,833	77,270	36.7%
<b>Total Whole of Farm</b>	<b>7,004</b>	<b>27,567</b>	<b>38,502</b>	<b>38,278</b>	<b>63,582</b>	<b>35,508</b>	<b>210,442</b>	<b>100.0%</b>
Previous Report 2021	7,004	27,567	38,502	28,159	52,451	-		

# Forestry on farm – C from exotics increase; from natives reduce profit

	Northland		Hawkes Bay	
	EBITDA	EBITDA+C	EBITDA	EBITDA + C
Base	76,832	<b>71,424</b>	342,825	<b>334,196</b>
10% Pine	74,328	<b>106,963</b>	336,405	<b>401,079</b>
30% Pine	64,668	<b>174,822</b>	350,904	<b>512,185</b>
100% Pine	64,985	<b>446,009</b>	173,275	<b>896,664</b>
30% Natives	29,869	<b>24,123</b>	117,346	<b>221,267</b>

High C prices will result in large scale afforestation of farmland; add to global food insecurity; shift emissions offshore (leakage)



# Climate Change Commission budgets out to 2035 reflect further land use change

- 380,000 ha new exotic forests
- 300,000 ha natives (mostly from hill country (red meat, wool sectors))
- 1.4 to 1.8m hectare marginal land, 740,000 ha could revert
- 2,000 ha per year from dairy to horticulture (26,000 ha)

- **Climate change will alter the allocation of natural capital to lower emission & nature repair**

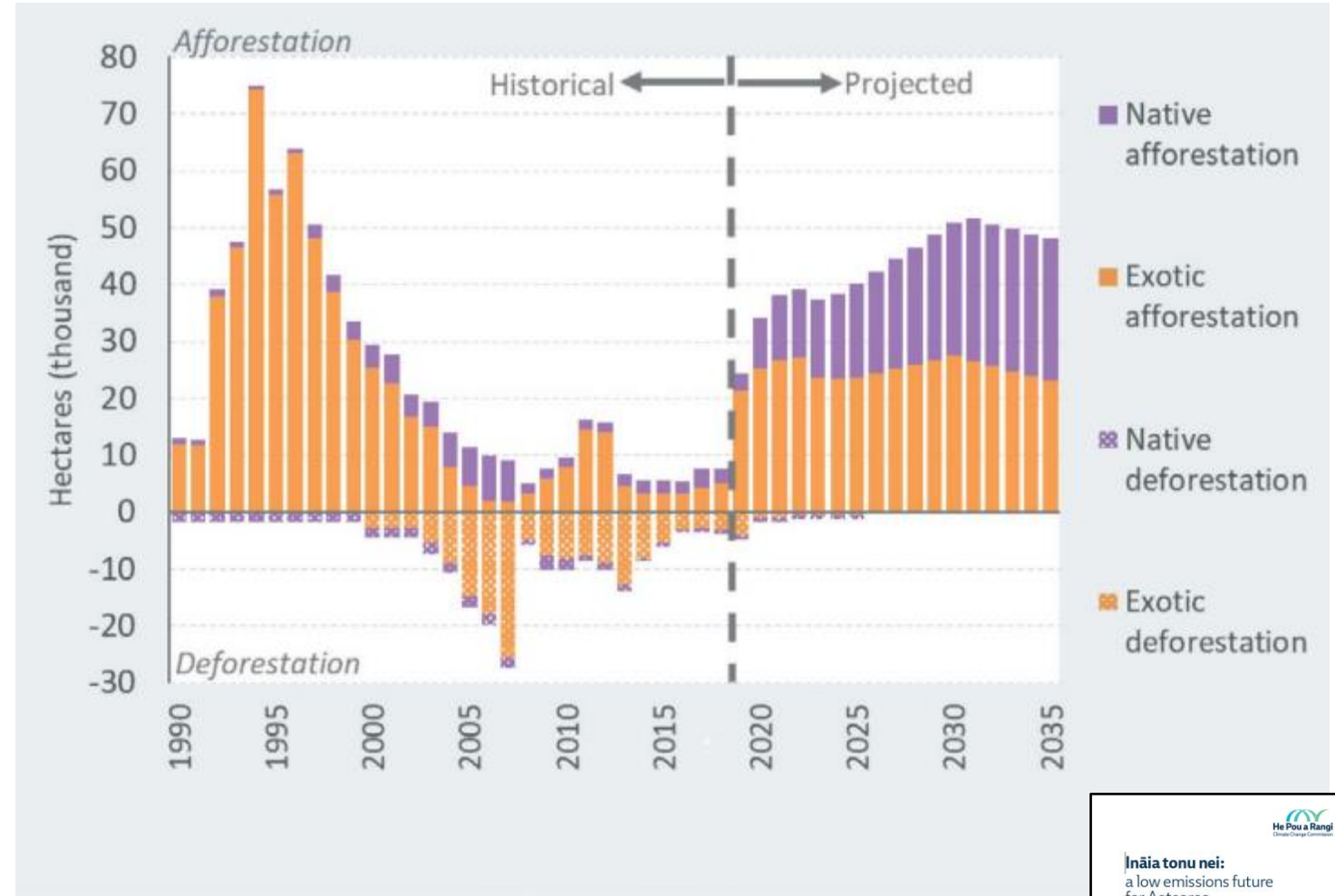
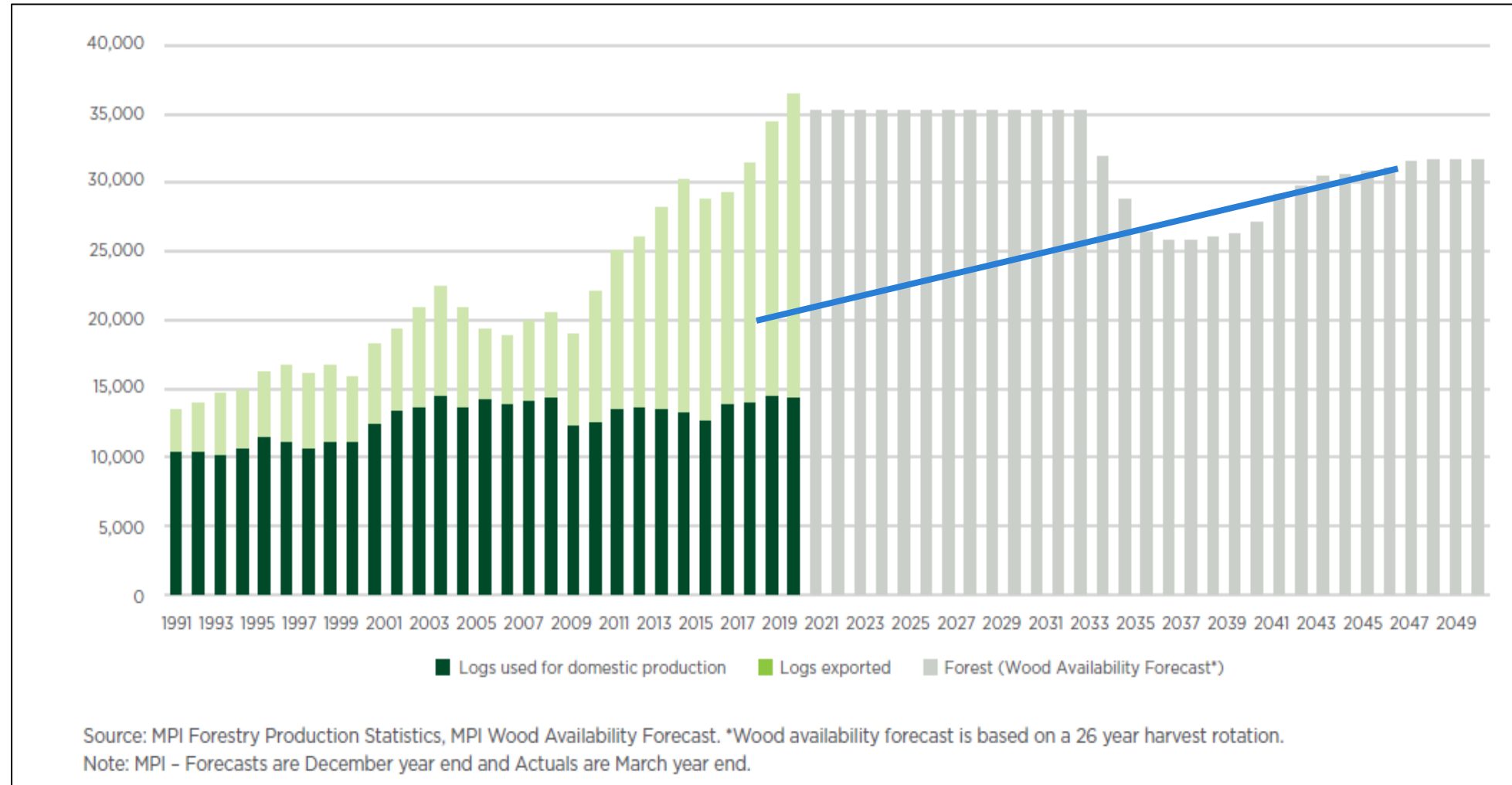


Figure 7.15: Afforestation and deforestation by year in the demonstration path

Source: Commission analysis

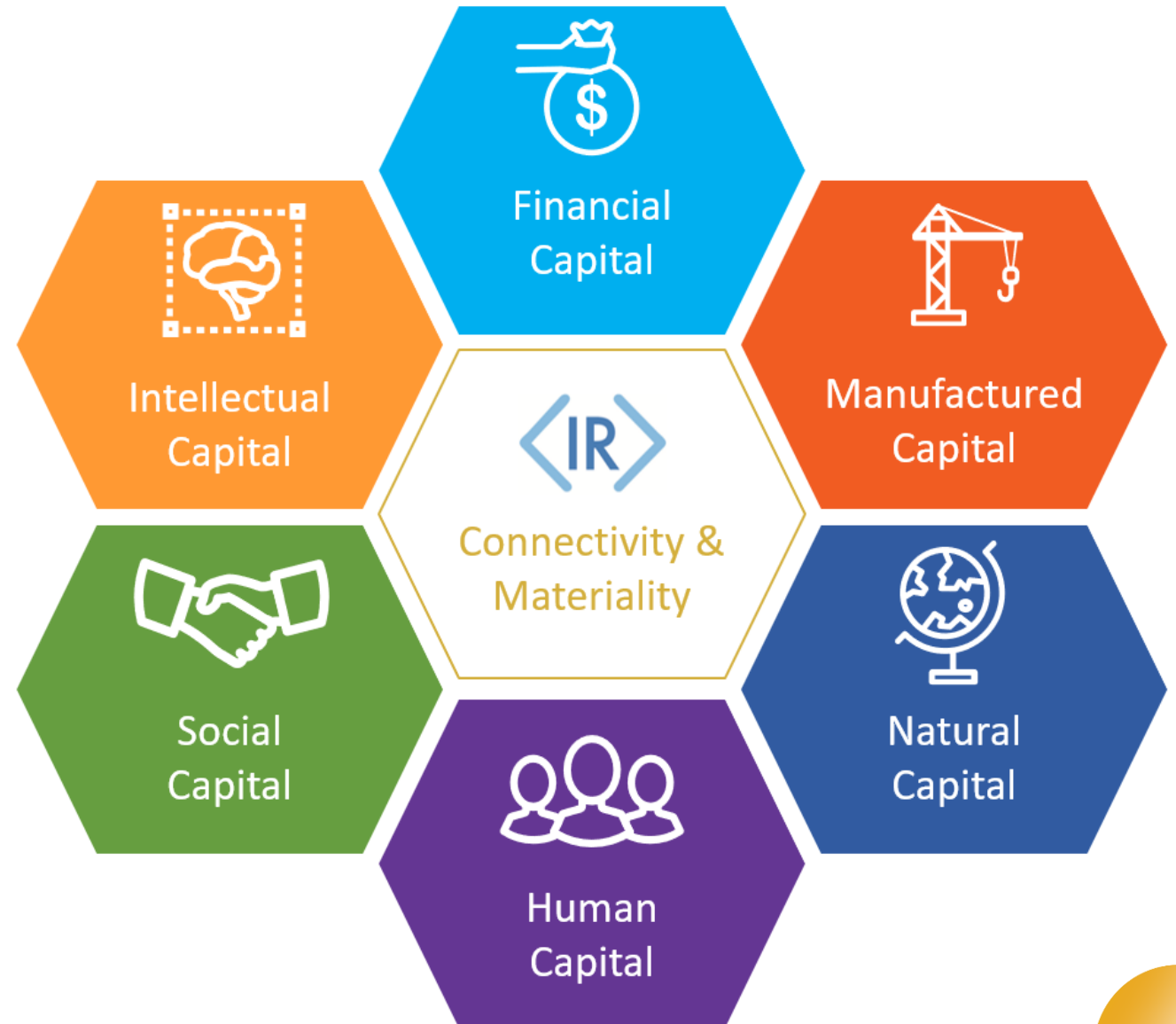


# Does NZ (or Australia) have sufficient trees to meet demand mid- to late-3030's even if log exports largely cease? No



# Natural capital interfaces with other [5] capitals –

human capital + IP = new methods [markets] for natural resource management

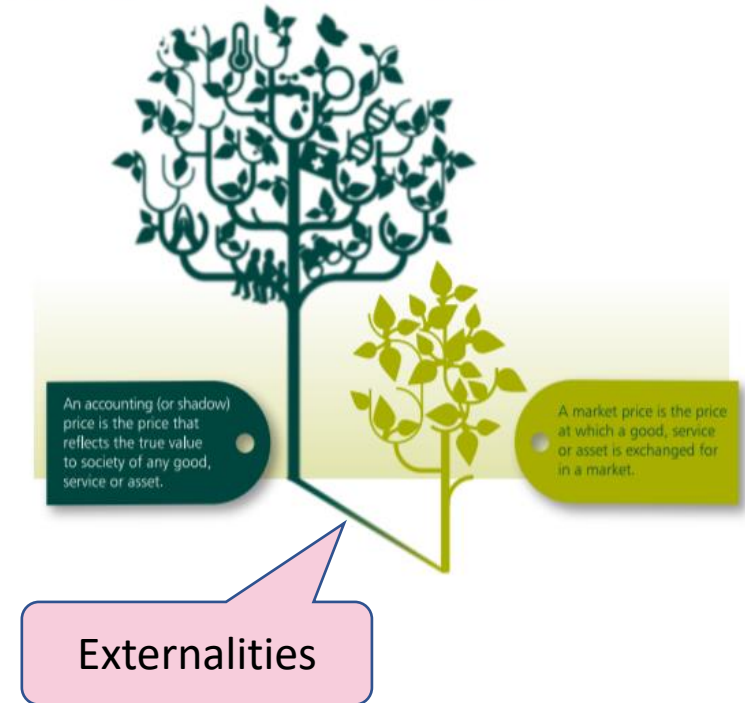


The Economics  
of Biodiversity:  
The Dasgupta  
Review



“....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.”

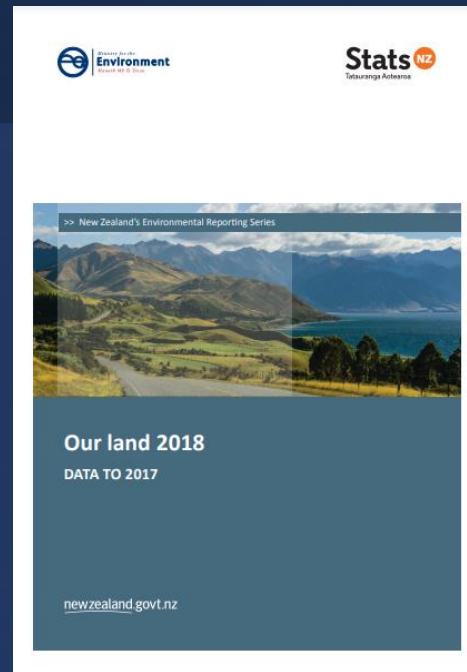
Figure 1.2 Market Prices and Accounting (or Shadow) Prices



The economic case for biodiversity – ecosystem services is compelling; measurement is more difficult!

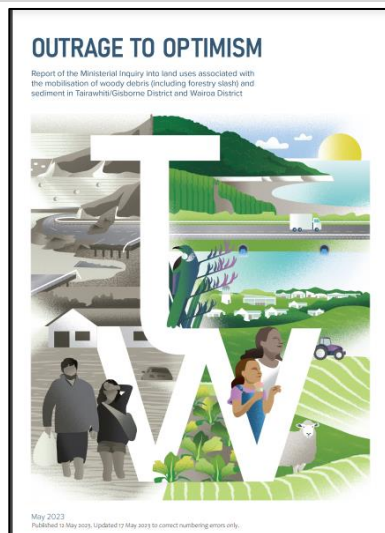


# Natural capital in NZ – measuring its state





# Social license challenged – Cyclone Gabrielle (Feb 2023)





**Cyclone Gabrielle windthrow Turangi, adjacent Lake Taupo February 2023; 5000ha ?**





A background image showing a close-up of a white wind turbine blade on the left side, extending towards the center. In the lower right, a small white sailboat is visible on a dark blue sea under a clear blue sky.

**INTEGRITY MATTERS:  
NET ZERO COMMITMENTS  
BY BUSINESSES,  
FINANCIAL INSTITUTIONS,  
CITIES AND REGIONS**

REPORT FROM THE UNITED NATIONS'  
HIGH-LEVEL EXPERT GROUP ON THE  
NET ZERO EMISSIONS COMMITMENTS  
OF NON-STATE ENTITIES

# What about offsetting?

(UN Report, October 2022)

“A high-quality carbon credit should, at a minimum, fit the criteria of **additionality** (i.e. the mitigation activity would not have happened without the incentive created by the carbon credit revenues) and **permanence.**”

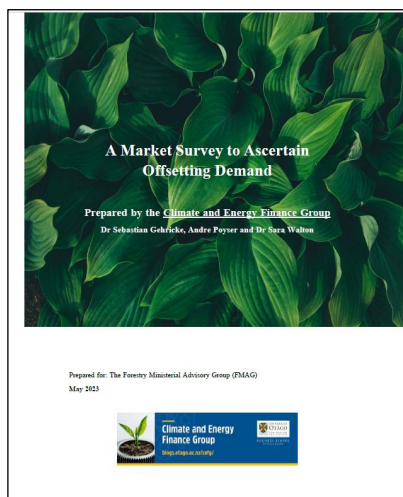


# Future of food - CarboNZero Silver Fern Farm beef – ‘nature positive’



# NZ business views on offsetting (May 2023)

	Abatement	Offsetting	Insetting
NZ entities (n =	74	12	14
Listed	73	24	4
Large	77	17	6
Small	5	5	90



Premium for Native credits (n=11)	
Less than 10%	4 (36%)
10-20%	5 (45%)
More than 20%	3 (27%)





# Land use policy to get trees in right place

- RMA reform (in progress – including long-term infrastructure planning for large scale forests >40,000ha)
- Temper/restrict landowner property rights through LUC/designated areas or by strengthening district planning provisions
- Reflecting this “C only” exotic forestry is to be brought under district planning laws like other land uses in November 2023



Pāmu Edendale farm, Southern Hawkes Bay



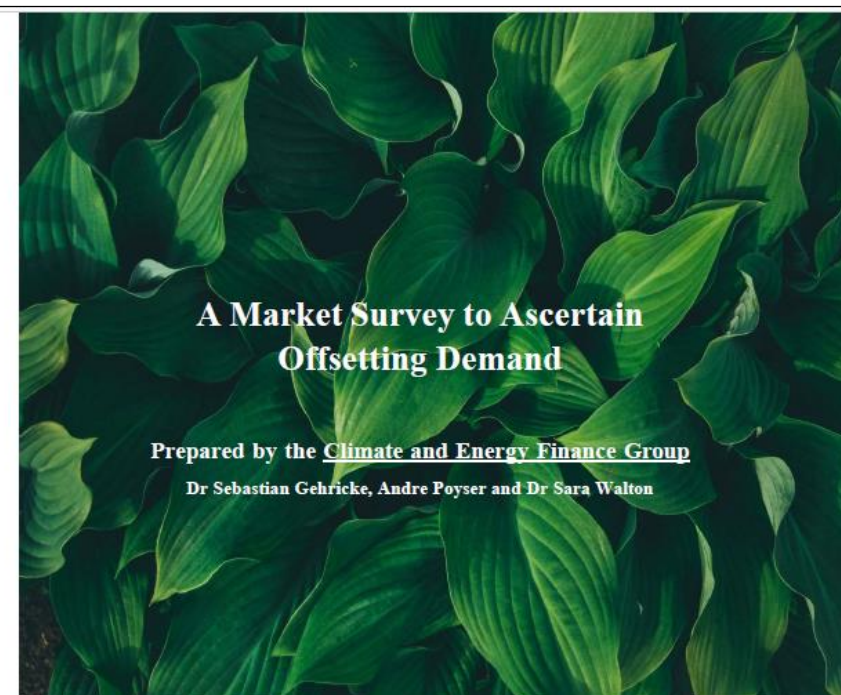
# Takeaways

- Forestry's paradox – vital to NZ's future, yet contested & lacking license
- ETS certainty for investor confidence & exemplar market for natural capital
- Forestry is a valuable, growing and complementary asset on many farms
- Further land-use change and reallocation of capital to lower emissions enterprises is inevitable and natural capital markets will facilitate this
- Digitalisation is key to unlocking and validating nature-based markets
- Land use policy, not C price is means to get trees in right place



**Table 8 Factors considered when making emissions reductions decisions.** This table shows the number and percentage of respondents that selected factors considered in the decision of their organisation to abate, offset or inset emissions. \*Respondents were allowed to select more than one response.

Factors	Number of Respondents	Percentage of Respondents
Our capacity to implement abatement and in setting projects	43	12%
The cost of abatement and insetting projects	41	12%
The opinions of the board on our carbon emissions	37	11%
The opinions of our customers/clients	32	9%
International best practices for emissions reductions	32	9%
The opinions of our shareholders on our carbon emissions	31	9%
The price of NZU credits	28	8%
We look at what the rest of the industry and our competitors are doing	28	8%
Regulatory changes in the emissions trading scheme	28	8%
The opinions of our employees on our carbon Emissions	22	6%
The introduction of regulations on disclosure of Emissions	19	5%
Other	10	3%
	351*	



Prepared for: The Forestry Ministerial Advisory Group (FMAG)

May 2023

