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Residual and log biomass fuel projections for New Zealand, 2026

Indicative availability by region and source

Peter Hall, Scion



Report information sheet

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Executive summary

Objective

The goal of this report and the accompanying tables is to describe the woody biomass residue resources in New Zealand by volume, type, energy content, and region over time from 2026 to 2055 (~30 years). The focus is on existing resources derived from established forests, wood processing, and other woody biomass residue streams etc.

The estimated delivered costs of biomass supply in 2026 are included. These are estimated costs, which include a profit margin, and should be regarded as indicative only. They are not, and are not meant to be, a price. The impact of diesel price on these costs can be substantial, with a 5% plus or minus change in transport costs possible based on the changes seen in the first half of 2026.

This report is an update and expansion of the preceding work done in 2023/24. This analysis includes more resources, with the addition of production thinning volumes, scrub, and wildings from Canterbury and short rotation forestry in Southland. The data on resources that were reported on in 2023/24 are updated based on the latest available information.

The potential for biomass supply from new forest, or bioenergy crop plantings such as short rotation coppice is not addressed here.

Approach

The various resources; in-forest post-harvest residues, municipal wood waste, wood processing residues, orchard residues, straws / stover from arable cropping, port bark, shelter belt turnover / harvest residues, production thinnings, waste thinnings, pruning residues, available pulp logs and some of the lower quality export logs are described in terms of gross volumes (green tonnes and energy) and two levels of recoverability. The estimates of recoverable material vary by resource but are intended to allow for some material being unsuitable for recovery for quality, financial or environmental reasons.

The in-forest, post-harvest residues are assessed as three categories based on the location of the residues, landings, flat to rolling cutovers (suitable for ground-based harvesting) and steep cutovers (cable / hauler harvest). The potential availability of post-silvicultural treatment residues such as waste thinnings and prunings are affected by slope. The split of forest where logging operations require hauler-based operations versus ground-based operations were estimated from Geographic Information System analysis at a Regional and Territorial Authority level.

The characteristics (moisture content, ash content, gross calorific value and typical net calorific value) of the residues are described.

The costs of the various resources including; any fees for accessing the materials, recovery / harvesting, hogging, screening, loading and transport are estimated based on 2026 costs for capital, fuel, labour etc. These costs are an estimate and are not intended to suggest market prices but as an indicator of where prices might start.

Key results

The woody biomass resource in New Zealand is substantial and is summarised below. These figures are for a variable percentage (1st recovery level, not the gross resource, which is higher) of the total resources estimated to be present. Full details on the percentages and the gross resources are presented in the methods and a set of appendices (tables) included at the end the report.

The long run supply of material that could be considered for wood and other lignocellulosic biomass fuels is around 4.2 million green tonnes per annum based on the low point in supply around 2037 caused by historic variation in forest plantings. If K grade logs, which are mostly exported, are included the volume increases to 10.0 million tonnes per annum. If A grade export logs are included the volume increases further, to around 17 to 18 million green tonnes per annum.

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
All in-forest post-harvest residues	2,675,000	1,916,000	1,946,000	2,092,000	2,145,000	2,180,000
Thin to waste residuals	210,000	194,000	132,000	184,000	192,000	193,000
Production thin residues	64,000	86,000	69,000	39,000	36,000	43,000
Production thin volume	466,000	500,000	108,000	115,000	-	-
Prunings	9,000	21,000	12,000	8,000	8,000	9,000
Port bark	226,000	203,000	192,000	226,000	226,000	226,000
Wood processing residues	-93,000	-93,000	-93,000	-93,000	-93,000	-93,000
Municipal wood waste	236,000	253,000	273,000	294,000	317,000	343,000
Orchard & vineyard	129,000	131,000	134,000	136,000	139,000	142,000
Straw and stover	295,000	301,000	307,000	313,000	319,000	325,000
Shelter belt	58,000	58,000	58,000	58,000	58,000	58,000
Pulp (exc. incumbent use)	2,530,000	1,861,000	1,060,000	1,098,000	1,199,000	1,108,000
Residuals & pulp	6,805,000	5,431,000	4,198,000	4,470,000	4,546,000	4,534,000
K grade	7,464,000	5,636,000	5,885,000	6,521,000	8,021,000	9,213,000
A grade	7,933,000	8,104,000	5,807,000	5,818,000	6,805,000	7,146,000
Sawmill chip	1,697,000	1,697,000	1,697,000	1,697,000	1,697,000	1,697,000
SRF E. nitens	113,000	104,000	86,000	95,000	60,000	37,000
Export log & chip	17,207,000	15,541,000	13,475,000	14,131,000	16,583,000	18,093,000
Total (residuals & logs)	24,012,000	20,974,000	17,672,000	18,601,000	21,130,000	22,629,000

A potential resource that could be used but is not suggested for use as a residual fuel resource, is stump wood. Volumes of these resources estimated to be available (green tonnes per annum) are shown below.

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2053
Stumps	341,000	174,000	110,000	142,000	148,000	159,000

Work is underway on assessing the wildings resource in the South Island as a wood fuel resource. So far only the Canterbury region has been assessed and the resource is modest. It would be a one-off volume of around 65,000 m³ (0.45PJ).

An estimate of current use of these residual woody resources is that around 850,000 green tonnes per annum is being used (up from 290,000 tonnes in 2024). However, this figure is likely to increase in the future as coal burning operations look to low carbon alternatives for their heat supply. The declining supply of natural gas from domestic sources along with the associated rising prices for gas may also lead to increased interest in wood as a process heat fuel. This use of the residuals needs to be tracked and publicly reported to give confidence to potential wood fuel users around available supply.

The cost of supply was estimated for the various resources, and a national level cost supply curve generated.

A summary graph of the volumes over time is shown below, on page 6.

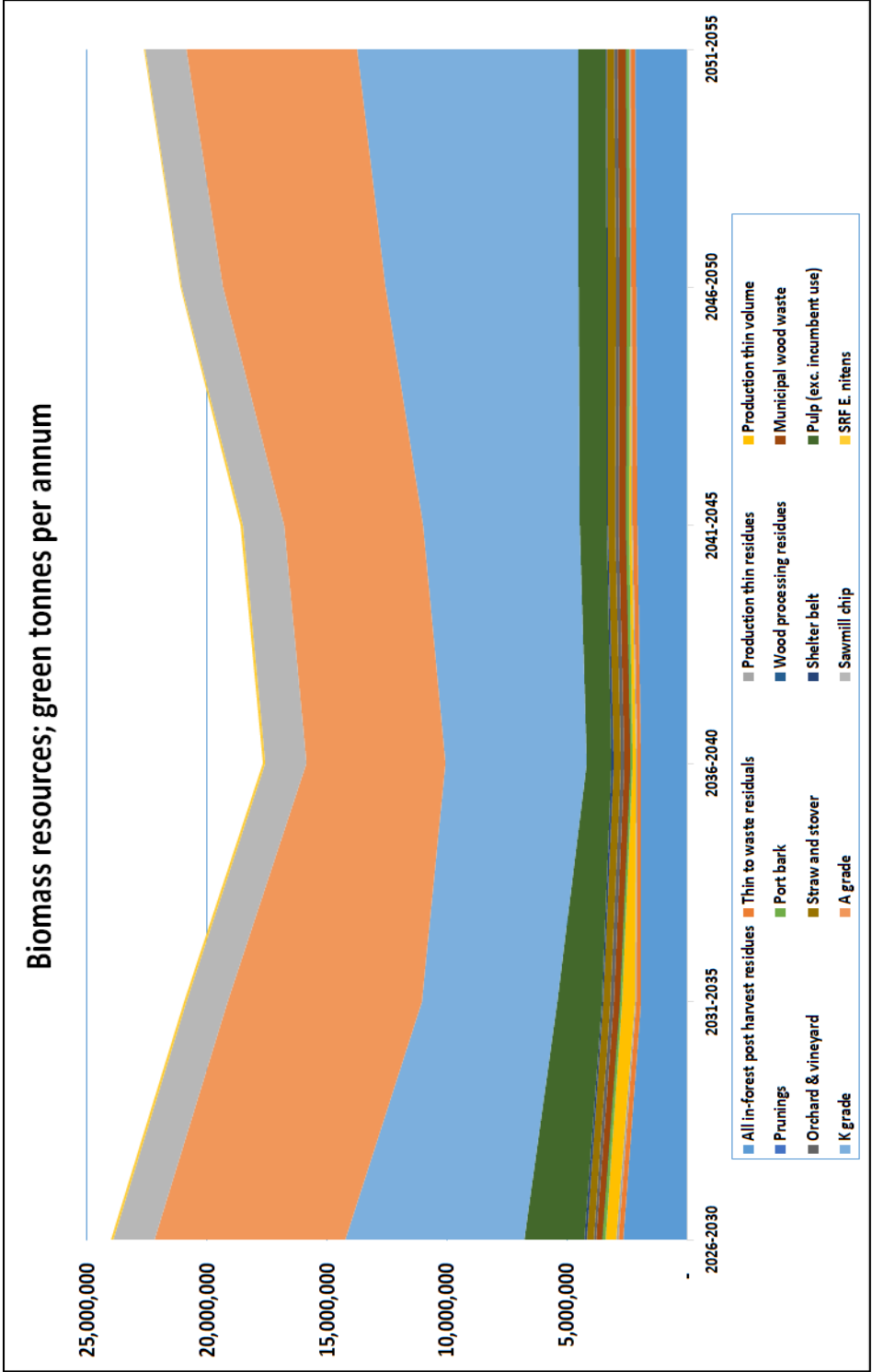
Further work

The data in this report is based on data available as of August 2026. As plantation forestry derived resources are a fundamental component of the woody biomass and as the situation regarding forestry plantings and removals changes over time this data will need updating in the future. The initial analysis of woody biomass resources in New Zealand and associated reporting was done in 2017, with expansions and updates in 2021 and 2024. It is suggested that another update be considered in 3 years' time.

A further critical issue is the increasing amount of use of some of these resources as boiler fuel replacing coal. Examples are the conversion of the dairy factory at Hautapu from coal to wood, the conversion of a laundry and dry-cleaning operation from coal to wood and the conversion a meat processing plant near Hamilton from coal to wood, along with the interest from other parties in similar conversions. Tracking the volume and location of this use so that the remaining available volumes are accurately represented at a regional level is of increasing importance.

Analysis of the potential for new afforestation to provide future supply is possible using GIS based models with input layers such as slope, site productivity, roading network, land prices, carbon prices and log prices (including energy products). This analysis would facilitate planning of future plantings.

As decreasing export log prices and rising costs put pressure on forestry operations (harvest volumes are down 5% in the first half of 2026) an analysis of potentially financially stranded stands (those not profitable to harvest) and the impact of this on the supply of residuals and low-grade logs should be considered.



Residual and log biomass fuel projections for New Zealand, 2026

Indicative availability by region and source

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Introduction

The intent of this report is to present estimates of current and future possible regional volumes of combustible biomass residues suitable for heat, heat and power, fuel supply and potential feedstock for biofuel production. Assessments are given for every 5-year period out to 2055; for gross supply and estimates of realisable / recoverable supply biomass (green tonnes) and energy (GJ).

The assumptions behind the information are provided to support the findings of the assessment and to allow others to apply their own interpretations to the base data on the levels of recoverable biomass.

The resource analysis covers in-forest harvest residues (from landings and cutover), thin to waste volumes from forests, pruning residues, unutilised wood processing residues, production thinnings, municipal wood waste, horticultural wood residues and agricultural (straw & stover) residues, bark from ports and material from shelterbelt turnover. Volumes of A, K and pulp grade logs are also estimated. The recoverable volume of stumps is also calculated, based on assumptions around reasonable limits on slope and soil disturbance. Estimates of the one-off volumes of material available from scrub clearance and wildings harvest are made.

In-forest residues were split into categories by site type; – landing / roadside, flat to rolling terrain (ground-based harvest) cutover and steep terrain (hauler harvest) cutover. These residues have differing levels of accessibility, levels of recoverability and costs of recovery (Table 1). There are environmental limits which need to be applied to some resources (e.g. straw and stover and in-forest cutover residues) to maintain soil fertility, biodiversity, and potentially mitigate soil erosion.

Estimates of currently surplus quantities available from wood processing facilities are included in the assessment. Wood processing residue availability estimates exclude those that are estimated as already being used by the wood processing industry to produce on-site heat and power.

The availability of pulp logs is based on the quantities remaining after meeting the demands of the pulp, paper, and fibre board industries.

Bark from ports is reported as a potential fuel resource. However, there are issues around this material and its availability in the future;

- most of it is currently used for landscape mulch or composting
- predicting future volumes is difficult given the uncertainty around the impact of both phytosanitary regulations and log export markets / volumes.

Estimates of the amount of greenhouse gases (GHGs) that could be reduced by displacing coal with biomass are made for national level data.

Glossary

CO	cutover
GB	ground-based
GHG	greenhouse gas
GCV	gross calorific value
GJ	Gigajoule
g. t.	green tonne = wood with an as received moisture content
LR	landing residues
MDF	medium density fibreboard
MWW	municipal wood waste
m ³	cubic metre
NEFD	national exotic forest description
NCV	net calorific value
odt	oven dry tonne = biomass at 0% moisture content
p. a.	per annum
PT	production thinning
Stover	corn stalk from maize grain harvesting
WAF	wood availability forecast
WPW	wood processing waste

Residuals Assessment: outline of approach and categories

Table 1 - outline of residue data categories and recoverability levels and factors

	Gross volume	Recoverable level 1	Recoverable level 2
Municipal wood waste	Total estimated at landfill	= Gross x 0.80 (to exclude treated and highly contaminated wood)	= Gross x 0.60 (for losses and sites too remote to use)
Wood processing waste	Gross amount after producer sites own use	= Gross x 0.95 to account for losses	=Gross x 0.90 for small remote sites and lack of participation
Horticultural residues	Gross amount produced	= Gross x 0.80 for losses during gathering and screening etc.	=Gross x 0.65 to account for sites too remote, small or lack of interest in utilisation)
Agricultural residues	Gross amount produced; accounting for 50% retention for soil sustainability	= Gross x 0.80 for losses during gathering and screening etc.	= Gross x 0.60 to account for sites too remote, small or lack of interest in utilisation)
In-forest Landing	Gross amount	= Gross x 0.80 to small / hard to recover	=Gross x 0.65 sites too remote
In forest Cutover a. Ground-based b. Hauler	Gross amount; a Gross amount; b	a. = Gross x 0.70, rest too small / hard to recover b. = 10% recoverable; rest assumed to be too expensive and risky	a. = Gross x 0.55; allows for sites that are too remote b. = 5% recoverable; rest assumed to be too expensive and risky
Port bark	Gross amount estimated from log volume	= Gross x 0.80 (to allow for losses and sales to other users)	= Gross x 0.60 (to allow for losses and sales to other users)
Shelter belt turnover	Gross amount estimated from mapping of shelter belts	= Gross x 0.80 to small / hard to recover	= Gross x 0.65 sites too remote
Production thinnings	Gross volume of residues (not thinnings volume)	= Gross x 0.80 to small / hard to recover	= Gross x 0.50 sites too remote
Waste thinnings	Gross volume of thinnings	= Gross x 0.50 to small / hard to recover	= Gross x 0.25 sites too remote
Prunings	Gross volumes of prunings	= Gross x 0.30 for flat / rolling terrain only	=Gross x 0.15 close to roadside only
Pulp logs	Volume of pulp logs after existing market demands are met	= Gross x 0.90 to small / hard to recover	= Gross x 0.90 sites too remote

K grade	Gross volume of KIS, KI and KS grades	= Gross X 0.95 to small / hard to recover	= Gross X 0.80 to small / hard to recover
A grade	Gross volume of KIS, KI and KS grades	= Gross X 0.95 to small / hard to recover	= Gross X 0.50 to small / hard to recover
Production thinnings logs	Gross volume of current and planned production thinning operations	= Gross X 0.80 to small / hard to recover	= Gross X 0.60 to small / hard to recover
Production thinnings residues	Gross volume of residues from production thinnings	= Gross X 0.80 to small / hard to recover	= Gross X 0.50 to small / hard to recover
Production thinnings expansion	Gross volume estimated to be harvestable by expanding production thinning onto all terrain where ground-based PT operations are viable	= Gross X 0.80 to small / hard to recover	= Gross X 0.60 to small / hard to recover
Stumps*	Gross volume of stumps from areas suitable from ground-based harvest. Steep terrain excluded. 1 in 4 stumps removed.	= Gross X 0.70 to small / hard to recover	= Gross X 0.40 to small / hard to recover
Wildings**	Estimate of gross recoverable Volume of biomass- Canterbury only	N.a. – included in original estimate	N.a. – included in original estimate
In-forest total	In-forest total	In-forest total	In-forest total
All biomass totals	All biomass Gross totals	All biomass total at recoverability level 1	All biomass total at recoverability level 2

*Gross volumes assume 350 stumps per ha, taking only 25% of these with each stump having a recoverable volume of 0.2 m³.

** Wilding harvest volume would be a one-off harvest, not a recurring resource that endures over time.

Methods

Fuel characteristics

Fuel characteristics (moisture content, ash content, net and gross calorific values) for the different resources were derived from a range of sources; including Trolove and Garrood (2007), Hall (2000, 2023), EECA (2010), van Loo (2008) and a range of unpublished laboratory testing results from bioenergy studies conducted by NZ FRI, Scion (Veritec Laboratory reports) and the Bioeconomy Science Institute (BSI).

Costs

Indicative delivered costs (including profit margins of 10%) were derived using 2026 cost inputs for capital, fuel, labour, overheads and consumables, etc. and the transport and harvesting system costing template (Excel spreadsheet) in Riddle (1994), revised by Blackburne (2009). Capital costs were sourced from the INFORME harvesting price guide (2026) and various other sources for items such as fuel, oil, tyres, labour, etc.

The same process was used on transport costs. Forest residue transport distances are based on forest industry data for average log hauls (Galbraith, 2007) and estimates of other distances derived from Google maps etc. 50 tonne (50Max) Gross Vehicle Mass (GVM) trucks were used in the transport cost analysis. The use of high productivity motor vehicles (HPMV) may reduce transport costs in the order of 5 to 10%, but it should be noted that these larger units are not able to use all rural roads due to bridge weight limit restrictions. At sites where the truck GVM is limited to 44 tonnes, the cost of transport could increase by around 5%.

These indicative costs do not necessarily reflect actual delivered prices as site specifics such as transport distance, limitations on truck size due to access restrictions and scale of demand can have a substantial influence. Costs were derived based on full utilisation of equipment, in reality some idle time will likely occur; increasing operation costs and risks which would be reflected in delivered prices.

However, as technology develops, and system productivity improves costs may reduce over time. For example, recent innovations in chipper technology are expected to substantially reduce fuel consumption in this part of the system (where chipping is applicable).

In-forest residues - maximum volumes

Forest harvest potential varies over time due to the uneven age class distribution of the plantation forests and can be estimated using data from the National Exotic Forest Description (NEFD) (MPI, 2023). If we are looking at long-term secure supply, we also need to consider the long-term (out to 2055) volume as the maximum supply, not the peaks that might occur before then. This is important because the in-forest residue resource is the largest residual biomass resource in New Zealand, and its fluctuations have considerable effect on the volumes available.

The low point in forest harvest and therefore in-forest harvest residue supply tends to occur at around 2035 to 2039.

In-forest residues smoothing

Due to the peakiness of the forest plantings (based on the mid 1990s planting boom) the residue calculation based on the forest age class data is also peaky. It is unlikely that the forest harvest will reach the maximum peak of potential wood available supply, as the required necessary harvesting infrastructure is not likely to be available. Therefore, some smoothing of the harvest is predicted to occur (MPI wood availability forecasts, 2021). In the analysis here, smoothing of the data has been applied by averaging of adjacent periods. This is a viable approach as the window of opportunity for forest harvesting can be 10 years (tree age 23 to 33 years).

Wood processing residues

Wood processing volumes were derived from a combination of data from Scions wood processing database (2026) and the EECA heat plant database (2018); which allows estimates of the volume of wood processing residues produced along with the demand for those residues at an individual processor level.

Municipal wood wastes

Estimates of municipal wood waste were derived from a survey of municipal landfills (Ireland-Blake 2017) conducted as part of the Scion Biofuels Road Map project. Anecdotally there is a further significant amount of wood waste going to non-municipal clean fill sites that has not been captured. Adjustments to the volume of wood waste based on population increases by region have been made.

Port Bark

Data on bark produced from a log export port was obtained and related to the volume of logs being exported. This data was used to estimate the volume of bark being produced at other log export ports. The unknown variable going forward is the log export volume. This has been estimated based on domestic processing demand and projected log volumes available. Harvest volumes do fluctuate to some extent based on log prices and demand. 2026 has seen a 5% drop in log export volumes in the first 6 months of the year.

Horticultural residues

Horticulture and viticulture residues are principally derived from the removal of old or unwanted trees and vines. Data on this was derived from Saggar et al 2007, which indicates that turnover rates in orchards range from 4% to 12% per annum depending on the crop. The amount of material is adjusted over time allowing for a small expansion of the industry. Not all the estimated gross material will be available for cost / access reasons and recoverability was set at 80% (high) and 65% (low) of the gross.

Agricultural residues (straws and stover)

The amounts of straw and stover residue produced were estimated based on Saggar et al., (2007) and Ministry of Agriculture and Forestry (MAF, 2011). Further, more recent data (2022) was obtained from the Foundation for Arable Research. The land area under crops was derived from the land cover database. The total amount of residual material produced must be reduced by half to give the gross available, as half the straw is deemed to be needed to be retained on site for soil nutrition and health (Saggar et al, 2007). Straw and stover data are presented in oven dry tonnes (odt) per annum, as opposed to green tonnes (g. t.) which were used for wood residues. From the gross tonnage we take 50% as the start point; then use two recoverability factors, 80% and 60%, to account for some material being lost during harvest and transport or being inaccessible or sold to other uses such as animal bedding.

Shelter belt residuals

A GIS map layer of shelter belts across New Zealand was used to determine the length of shelter belts present. Google Earth was used as a cross reference for this map layer and as an estimator of shelter belt width. Taking the length of shelter belts by region, an average width 6 metres and assuming a 60-year life for a shelter belt, harvest volume of 540 m³ per ha of shelterbelt and 30% residuals an estimate of the amount of woody biomass from turnover of shelterbelts was derived.

Production thinnings residues

The volume of residual material available from production thinnings was not included in the previous analysis. Residue volumes have been derived from the area by age class of tree crops identified as being planned to have a production thinning in the 2023 NEFD (MPI, 2023). The volume to be extracted was estimated by simulating the size of the trees at production thinning age by region and then taking proportion of that volume as waste generated at landings during stem to log processing.

Production thinnings

The volume from production thinnings was not included in the previous estimate of biomass resources, only the residuals from these operations as above. Here we have estimated the volume based on the NEFD figures for *Pinus radiata* plantations by area, management regime and region and along with yield tables used these figures to estimate the volume of material from production thinnings. Generally, this material would be sold into the post and pole or pulp/chip log markets, including MDF feedstock. However, if these markets are weak or absent this material could be used as an energy feedstock.

Potential production thinnings

There is a lot more area of New Zealand's plantation forest that could be subject to production thinning based on the terrain it is planted on. Even limiting the area to modest slopes would still allow larger areas to be managed this way and the thinned material could be used as a bioenergy feedstock. A separate report (Hall, 2026) on this potential volume was used as the data source. The figures were generated using the NEFD data for *Pinus radiata* plantations by area, management regime and region and along with yield tables.

Waste thinnings

The area of waste thinnings being carried out was estimated from the 2025 NEFD and the volume of material (stem and crown) was derived from a combination of forestry models; PradCalc and NuBalM.

Prunings

Prunings are considered an unlikely source of biomass due to the cost of extraction. However, the material exists and there have been enquiries about extracting it. As the analysis of thinnings etc had identified the areas being pruned (MPI, 2025) and the crown mass of the trees can be estimated using NuBalM the amount of crown mass available from pruning was estimated, based on the assumptions that there would be 2 pruning lifts and that at least 1/3rd of the green crown was left after pruning.

Pulp logs

Pulp logs have a market in many regions, but not all. Examples of areas with no major adjacent pulp log market are; Gisborne, Wairarapa and Douglas-fir in Southland / Otago and parts of West Coast. Therefore, there are some regions where the pulp logs are potentially available for use as an energy feedstock. Further there are indications that the existing pulp log buyers may be challenged by the energy market as pulp logs sell for below the full cost of production. Our approach with pulp logs is to determine the gross supply from forests, (which is reported) and then show the regional availability after the incumbent buyers off-take is allowed for.

Sawmill chip

Sawmill chip also generally has existing outlets, with either pulp and paper, fibre board and chip exports being the main destinations, depending on the region. However, there are already some mills selling chip as fuel. Based on the Scion wood processing database we estimated the quantity of sawmill chip that is available and reported that volume. Information on where the sawmill chip goes is not publicly available in most cases. The amount of chip produced varies slightly from mill to mill but is typically in the order of 25 to 28% of the log volume.

K-grade logs

K grade logs (including, K, KI, KS and KIS) are low-quality logs that are a common product in most *radiata* pine plantation forests. They make up on average around 24% of the total recoverable volume in a harvest block although this percentage can vary from 17 to 33% depending on the region and regime. The available harvest volume for each region was calculated based on the area of pine forests by regime reported in the NEFD (MPI 2025) and then the proportion of K grade logs by regime and district was estimated using PradCalc (Kimberley, 2014). These calculations allow

the approximate volume of K grade logs that are likely to occur now and in the future. The price of K grade logs was derived from a log price database. The prices for logs have been quite volatile over the last 3 years, so a 3-year monthly log price average was used (Table 2). For K grade logs the gross volume was estimated by forest crop modelling and then recovery rates of 90% and 70% were applied for recoverability levels 1 and 2, respectively. The main outlet for these logs is export, with an estimated volume around 6 million m³ per annum.

Table 2 – K grade log prices (36-month average \$ per green tonne delivered)

Grade	3-year average
K	\$104
KS	\$102
KI	\$93
KIS	\$76

Douglas-fir production thinnings

Douglas-fir generally uses different regimes to radiata pine, and it is common for Douglas-fir stands to have a production thinning if there is a suitable market for the logs and the terrain is not steep. These logs tend to be small diameter. They are not generally a preferred feedstock for MDF or pulp and paper in New Zealand. A lot of the Douglas fir resources in New Zealand are in Otago and Southland where the key outlets for pulp logs are MDF and export. The volume of Douglas fir produced was derived from areas of Douglas fir by age class reported in the NEFD (MPI, 2025) and estimated yields from production thinning using a conventional regime. The logs produced could be a fuel resource if the price paid is sufficient to cover the costs of logging, transport and chipping with some margin for the grower.

Stumps

Stumps are created on every logging site within the plantation forest estate. In some countries (e.g., Finland) stump harvesting for biomass for energy has been practised for some time. In New Zealand stump harvesting has been limited to areas of land clearing (forest to dairy conversion) and for supply to a resin extraction plant (operation now closed). In our analysis of the potential resource, we have made some assumptions that affect the volume available significantly. Firstly, we assume that any land steep enough (over 19 degrees) to require hauler harvesting is not suitable for stump harvesting due to issues arising around rainfall, sediment production and erosion. Secondly, we assume that only 1 in 4 stumps is removed – this is a limit applied in some countries to limit the level of soil disturbance and soil carbon loss. Stump volumes are assumed to be 0.15 m³ per recovered stump (anecdotal data from forest to farm conversions supported by volume estimate calculation) and that there are 350 stumps per hectare.

A-grade logs

A grade logs are larger diameter than K grade, with smaller knots, but are largely exported rather than processed in New Zealand. They comprise 22 to 29% of the total recoverable harvest volume, depending on the regimes used (pruning or not has a considerable influence). Based on the NEFD data for the various regions, including on the area by regime, an estimate can be made for the volume of A grade logs being produced. They have been selling for around \$117 per green tonne delivered (36-month average).

Short rotation forests

New Zealand has a limited area of what would be called short rotation forest (SRF) and none of it is planted in *Pinus radiata*. The only areas of forest that might be considered SRF of significance are in Otago and Southland and are in *Eucalyptus nitens*, which is grown for chip export using a rotation age of 18 to 20 years. In theory this material could be sold into the New Zealand energy market if the price was attractive.

Wildings

There is a substantial area of the South Island of New Zealand affected by the presence of wilding conifers. However, the trees are often, small, at low stocking per hectare, unevenly spread and on very difficult terrain, eliminating much of the wilding affected area from being viable for harvesting. An analysis of the wildings in Canterbury based on a map of the wildings, lidar data on canopy height a, tree count showed only a modest volume available for recovery.

Results

Residual material - fuel characteristics

Typical fuel characteristics for the range of resources assessed are shown in Table 3. The gross calorific values (GCVs) are adjusted for ash content. The net calorific values (NCVs) reflect the effect of moisture content.

It should be noted that the GCVs and NCVs are not absolute values - they are typical averages. Biomass is inherently variable and multiple samples give a better indication of long-term average energy values than any individual sample.

Woody biomass is by its nature quite variable from site to site as well as piece to piece, and results for individual samples will likely vary from the averages. For example, some *Pinus radiata* biomass has high levels of resin content and this can push the net energy content for that sample up as high as 22 to 23 MJ/kg oven dry. However, these levels are not a typical average for softwoods, which is generally accepted as being 18.7 to 18.9 MJ/kg oven dry.

Further, there are variations in ash and moisture content from sample to sample that will change both the GCV and the NCV. Again, the values presented are typical averages. When conducting a site-specific analysis of the opportunities it is important to consider the impact of ash, moisture etc. and get some samples tested. Setting of delivered fuel quality standards is therefore critical when considering wood fuel purchase. Likely ranges for moisture, ash and NCV are shown in Table 4.

In the tables below; CO = cutover, GB = ground based, MWW = municipal wood waste and WPR = wood processing residues.

Table 3 - summary of fuel properties by residue type

	Moisture Content % wet basis	Ash Content % dry weight	GCV, GJ per tonne	NCV, GJ per tonne	NCV - 5%	NCV + 5%
Landing stem	56.5	1.8	19.8	6.8	6.5	7.2
Landing mixed	54.0	4.5	19.3	7.0	6.7	7.4
CO GB stem	51.5	0.9	20.0	7.7	7.3	8.1
CO GB mixed	51.5	4.8	19.2	7.4	7.0	7.8
CO Hauler stem	51.5	0.9	20.0	7.7	7.3	8.1
CO Hauler mixed	51.5	4.8	19.2	7.4	7.0	7.8
MWW	31.5	4.5	19.3	11.0	10.5	11.6
Orchard*	51.5	1.5	19.9	7.9	7.5	8.3
Straw	13.5	6.8	18.1	14.4	13.7	15.1
Stover	20.0	5.6	17.8	13.8	13.1	14.5
WPR Wood**	58.0	0.5	20.1	7.3	6.9	7.7
WPR Bark, debarker	53.0	3.0	19.6	7.4	7.0	7.8
WPR Bark, yard	58.0	7.5	18.7	6.1	5.7	6.4
Logs (Ks, A, SRF and thinnings)	58.0	0.3	20.1	7.1	7.4	6.7
Stumps	58.0	8.7	8.5	22.9	24.0	21.7

*Includes vineyards and kiwifruit orchards as well as pip, stone fruit and citrus orchards.

**WPR = wood processing residues includes a mix of residues (sawdust, off-cuts and dry shavings)

In-forest residues can be seasoned, or force dried after hogging or chipping. Fuel treated in this way is likely to have a moisture content of around 35%, with an NCV of around 11 GJ per tonne.

In-forest residues, such as waste from thinnings and prunings, are expected to have properties similar to ground-based cutover residues.

Table 4 - ranges of fuel properties likely to be encountered

	Moisture Content	MC -10%	MC +10%	Ash Content	Ash -10%	Ash +10%	NCV, GJ/tonne	NCV -10%	NCV +10%
Landing stem	56.5*	50.9	62.2	1.8	1.6	1.9	6.8	6.1	7.5
Landing mixed	54.0*	48.6	59.4	4.5	4.1	5.0	7.0	6.3	7.7
CO GB stem	51.5	46.4	56.7	0.9	0.8	0.9	7.7	6.9	8.5
CO GB mixed	51.5	46.4	56.7	4.8	4.3	5.2	7.4	6.7	8.1
CO Hauler stem	51.5	46.4	56.7	0.9	0.8	0.9	7.7	6.9	8.5
CO Hauler mixed	51.5	46.4	56.7	4.8	4.3	5.2	7.4	6.7	8.1
MWW	31.5	28.4	34.7	4.5	4.1	5.0	11.0	9.9	12.1
Orchard / Vineyard	51.5	46.4	56.7	1.5	1.4	1.7	7.9	7.1	8.7
Straw	13.5	12.2	14.9	6.8	6.1	7.5	14.4	13.0	15.8
Stover	20.0	18.0	22.0	5.6	5.0	6.2	13.8	12.4	15.2
WPR Wood	54.5	49.1	60.0	0.7	0.6	0.7	7.3	6.6	8.0
WPR Bark, debarker	53.0	47.7	58.3	3.0	2.7	3.3	7.4	6.7	8.1
WPR Bark, yard	58.0	52.2	63.8	7.5	6.8	8.3	6.1	5.4	6.7
Stumps	58.0	56.0	60.0	**					
Logs	58.0	56.0	60.0	0.5	0.45	0.55	6.9	6.2	7.6

*Logs and unprocessed landing residues can be dried to around 35% by simply stockpiling them and leaving them for 3 to 4 months.

**Stump ash content is likely to be high (>5.0) and variable.

Straw and stover volumes are substantial in some regions (Canterbury) - and they are included as they are a combustible ligno-cellulosic biomass. However, these materials are not suited to use in existing boiler infrastructure and require purpose-built boilers that are designed for straws. Otherwise, densification and co-firing at low percentages (>5%) in coal boilers may be possible. The principal issue with straws is the high ash content and the elemental composition of the ash which leads to lower ash fusion temperatures and can cause fouling of the boiler if combustion conditions are not set correctly. There is potential to co-fire both wood pellets and straw pellets.

Recoverability factors

There is a difference between the gross amount of a biomass resource potentially available and that which can realistically recovered or should be recovered. The recoverability factors used in this analysis are outlined in Table 5. The recoverability factors were set based on industry feedback.

Table 5 – recoverability factors by resource type

Residue type	Recoverability factor 1 (% of gross)	Recoverability factor 2 (% of gross)
In-forest residues - landings	80	65
In-forest residues - cutover	70	55
Wood processing residues	95	90
Municipal wood waste	80	60
Port bark	80	70
Horticultural residues	80	65
Straw and Stover*	70	60
Shelter belt residuals	80	60
Production thinnings	85	70
Production thinnings residuals	80	50
Waste thinnings	50	25
Prunings	30	15
Pulp log	95	90
Sawmill chip	75	50
K grade logs	95	80
A grade logs	90	80
Douglas-fir production thinnings	80	50
Stumps	80	50
Short rotation forests	90	80

*Only half of the total supply of straws is considered to be part of the gross available supply. This is due to the need to retain some of the straw on site to maintain soil nutrient levels.

Costs

The costs of producing the biomass as a fuel by categories were assessed. It should be noted that these are estimates of the costs and are not necessarily the same as a market price, which may be higher. Therefore, they are only an indicator of price. These costs estimates are presented in Table 6 and are based on operating costs as of August 2026. All prices include a fee paid to the owner of the residual biomass. This fee varies with the type of raw material. The costs also include a transport cost for an assumed transport distance of 90 km (residual source to user). A key driver of change in the costs presented here and those in previous estimates is the cost of diesel which has risen substantially.

Table 6 – estimated costs for various biomass resources delivered (90 km) in fuel form

Residue type	Biomass owners fee: \$ per green tonne	Cost \$ per green tonne	Cost \$ per GJ
Port bark	\$5.50	\$23.00	\$3.40
Shelter belt residuals	\$21.90	\$39.30	\$3.70
Horticultural residues	\$11.00	\$28.40	\$4.20
Municipal wood waste	\$11.00	\$32.80	\$4.80
Wood processing residues	\$21.90	\$52.40	\$7.70
Pulp log	\$64.40	\$64.40	\$9.40
Straw and Stover*	\$109.10	\$141.80	\$13.00
In-forest residues - landings	\$27.30	\$92.70	\$13.50
Douglas-fir production thinnings	\$70.90	\$101.50	\$14.80
In-forest residues - cutover	\$21.90	\$102.60	\$14.90
Production thinnings	\$75 to \$93	\$75 to \$93	\$11 to \$14
Production thinnings residuals	\$21.90	\$103.60	\$15.10
K grade logs	\$103.60	\$103.60	\$15.10
Waste thinnings	\$21.90	\$114.50	\$16.70
Sawmill chip	\$87.30	\$117.80	\$17.20
A grade logs	\$127.60	\$127.60	\$18.60
Prunings	\$5.50	\$130.90	\$19.10
Stumps	\$27.30	\$158.10	\$23.10
Short rotation forests	\$123	\$123.00	\$17.80

*Straw is assumed to have a “green” moisture content of 15% wet basis

The national level cost supply curve for biomass by resource type and assuming recoverability level 1 for each resource are shown in Figures 1a (\$ per GJ) and 1b (\$ per tonne). The amounts available are based on the long run supply which has a low point around 2036 – 2040. The data in Figure 1 is deemed to be more useful for comparative purposes as the GJ per tonne varies with fuel type. The data in figure one gives a visual indication of the significance of each resource by the amount of energy available per annum.

Figure 1a – Cost (\$ per GJ) supply curve for national amounts (GJ per annum) of biomass by resource type

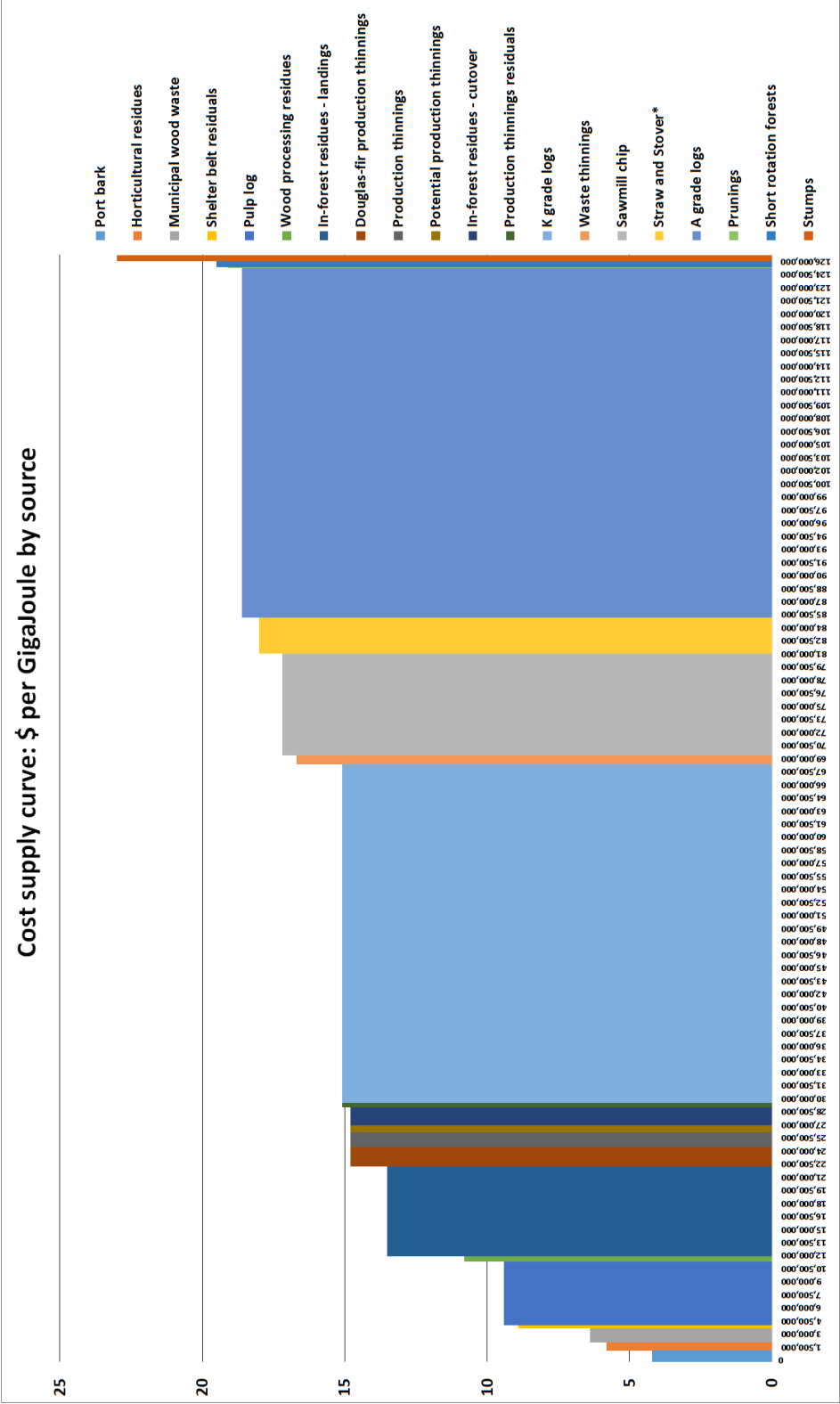
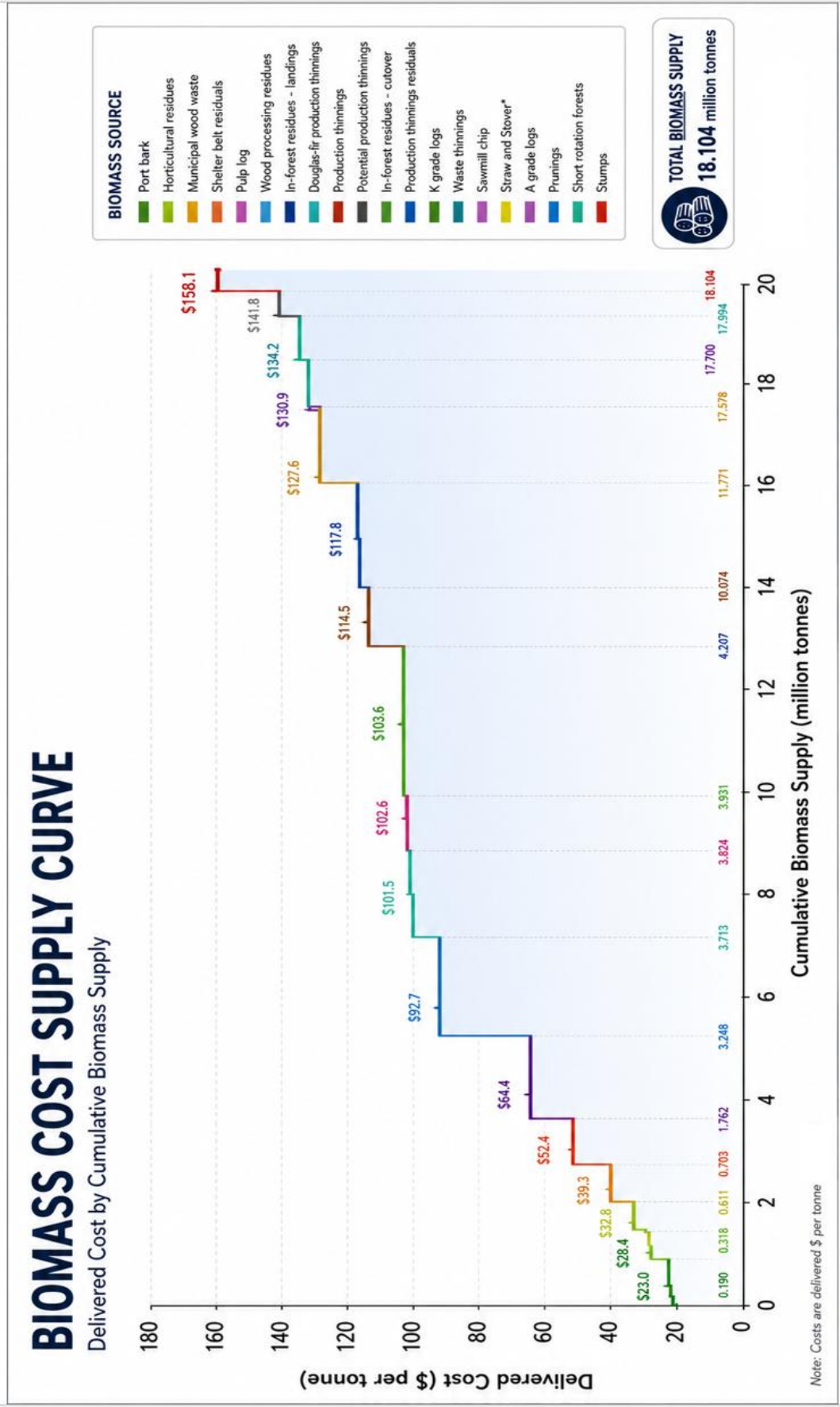


Figure 1b - Cost (\$ per green tonne) supply curve for national amounts (GJ per annum) of biomass by resource type



Volumes over time by resource type and region

The volumes of material available over time for each resource type are presented in the series of graphs below. The data presented in this section are annual averages and cover the period 2026 to 2055 in 5-year steps. The data behind these graphs is presented in Appendices A to W. Further data is presented in the Appendices; gross volume and energy as well as values for recoverability levels 1 and 2 for both volume and energy.

In-forest residues

The gross amount of in-forest post-harvest residues available by region over time are shown in Figure 2.

Figure 2 – Gross volume of in-forest post-harvest residues by region, g. t. per annum

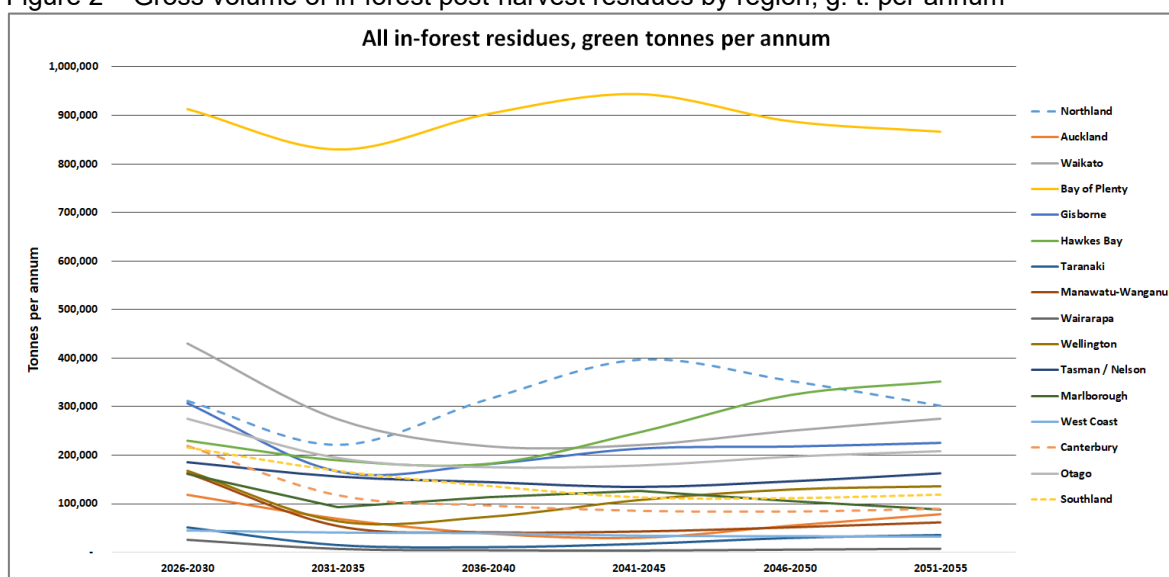
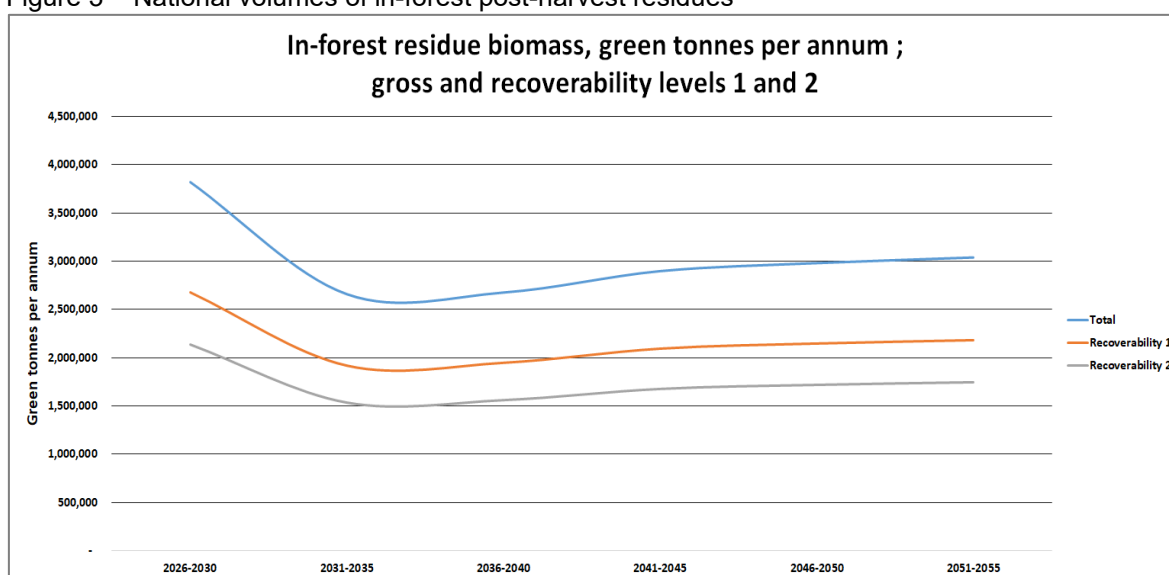


Figure 3 shows the national gross volume of in-forest post-harvest residues and the amounts available assuming different recovery rates.

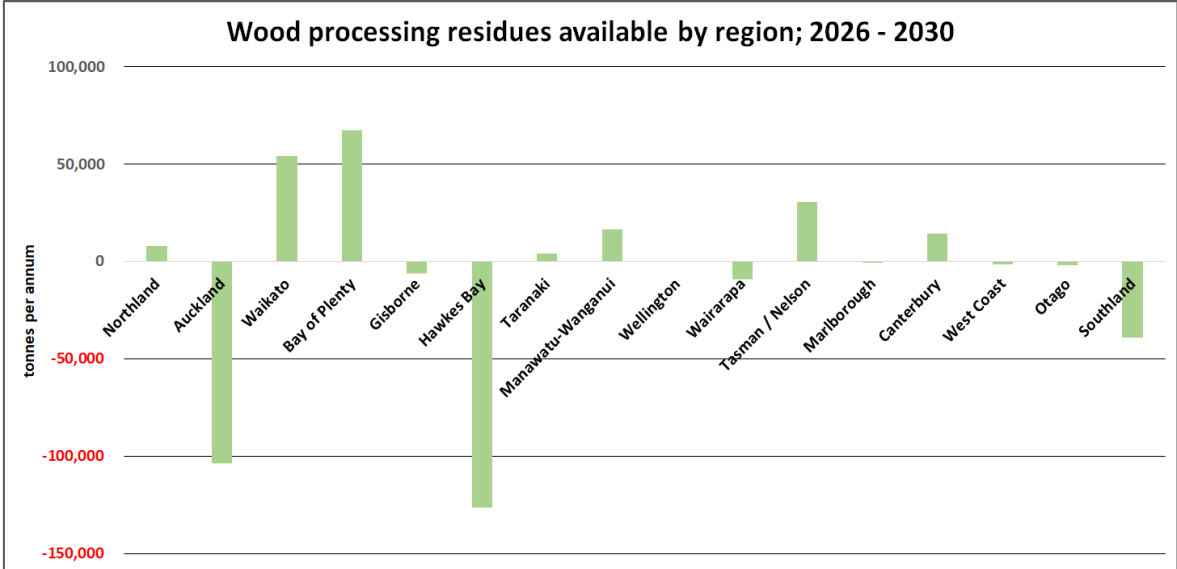
Figure 3 – National volumes of in-forest post-harvest residues



Wood processing residues

The data for wood processing residue production and consumption show that overall, these are close to being in balance. Whilst the data in Figure 4 shows pluses and minuses, the overall deficit is around 8% of the total demand. Given the margin of error on the data (which is a calculation not a measured value) it is suggested that there is little wood processing residue available outside the industry once incumbent users demands are met. There is trading between wood processing entities and some of this is across regional boundaries (e.g. Waikato and Bay of Plenty).

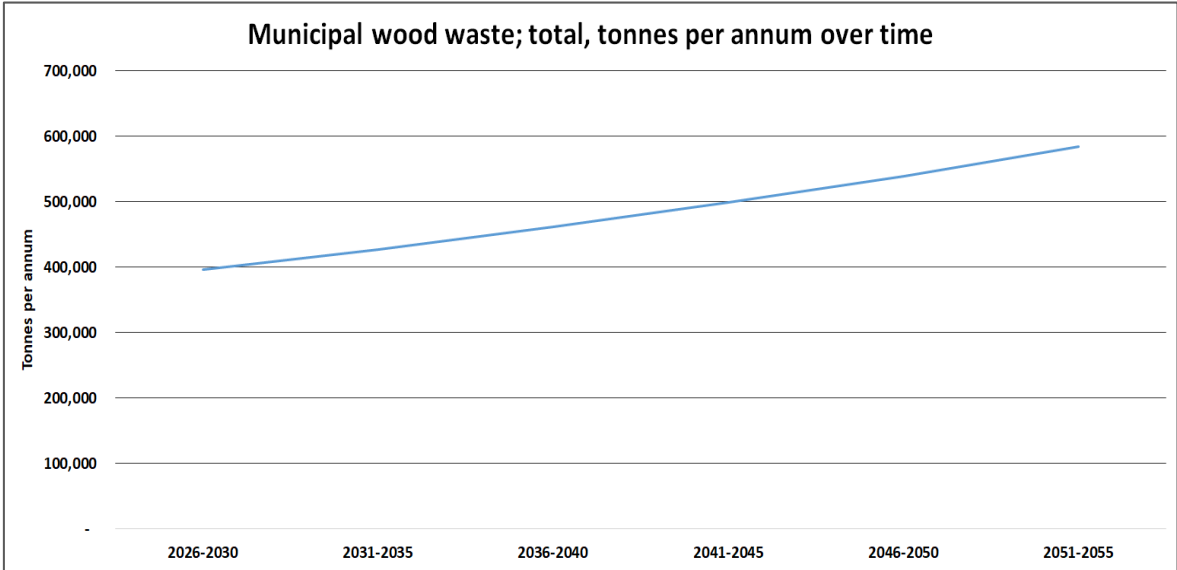
Figure 4 – Wood processing residues by region



Municipal wood wastes

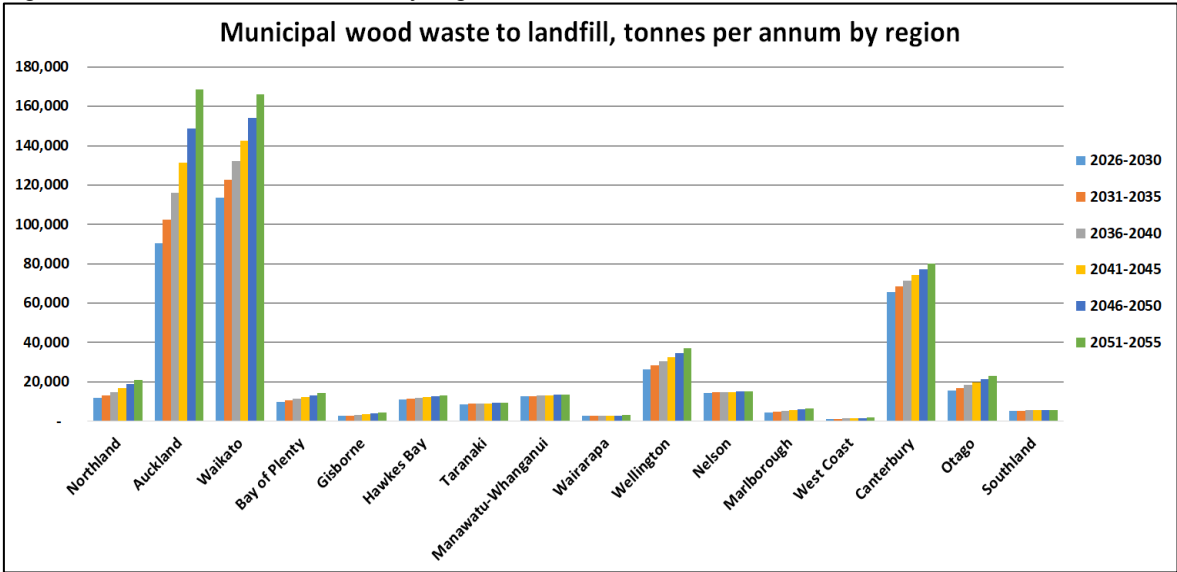
The gross amount of municipal wood waste estimated to be available is shown in Figure 5. Growth in this volume over time is driven by projected population growth. Projections are based on census data.

Figure 5 – Municipal wood waste to landfill, national total



Projections of wood waste to landfills are presented in Figure 6. The increases over time are based on population growth data from census figures, hence some regions have much steeper increases than others.

Figure 6 – Wood waste to landfill by region



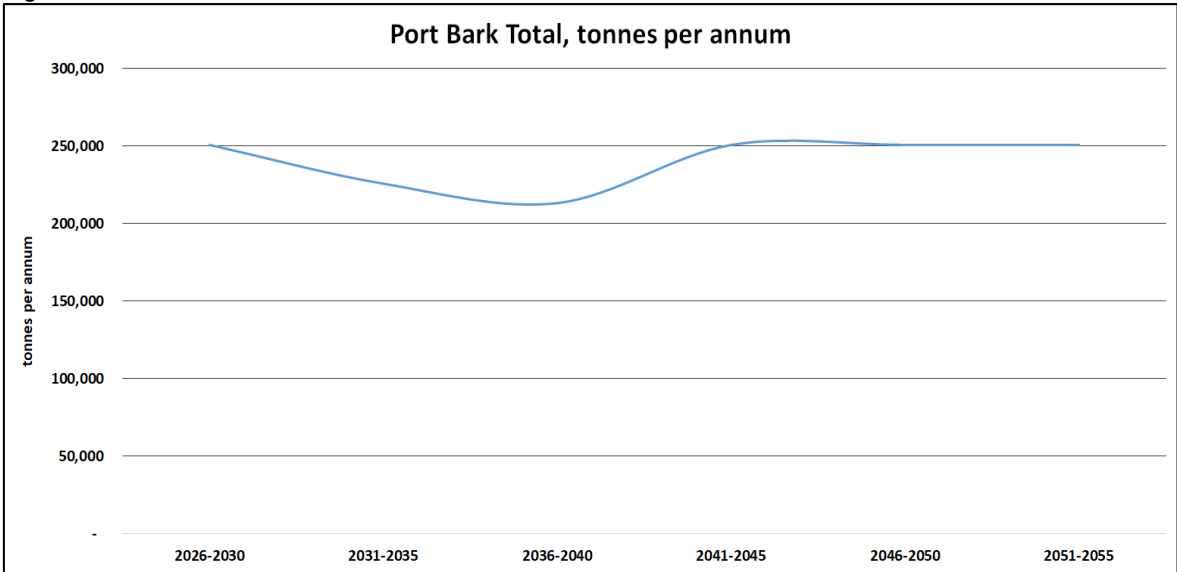
Anecdotally there is a significant amount of wood waste going into “clean-fills” that do not record the amounts of material being dumped. It has been suggested that this amount is roughly equivalent to that which is going into municipal landfills.

More data on the potential resource from the undocumented volume going to clean-fills would be useful but is difficult to find as much of it is not recorded.

Port Bark

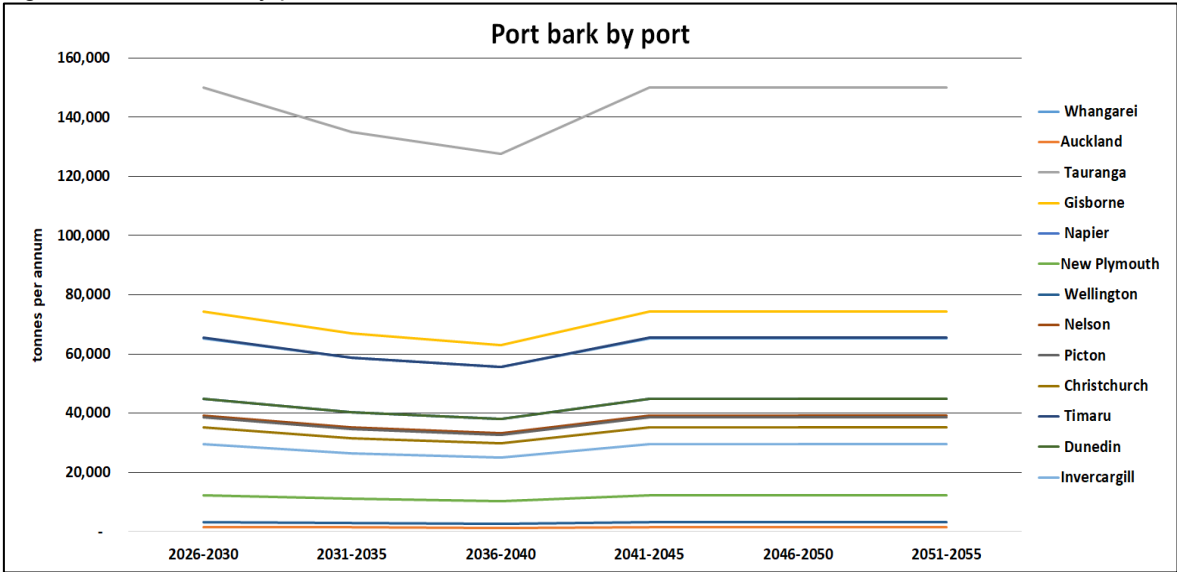
The data in Figure 7 reflects the estimated amount of bark (green tonnes per annum) available at log export ports. This bark is that from log yard debris. The decline in volumes post 2035 is due to the expected drop in New Zealand’s forest harvest and therefore reduced log export volumes.

Figure 7 – Port bark national total



There are 13 ports around New Zealand that export logs. The estimated volume of bark produced for each port is shown in Figure 8. Ports with large volumes of logs passing through them (e.g. Tauranga) have larger volumes of bark.

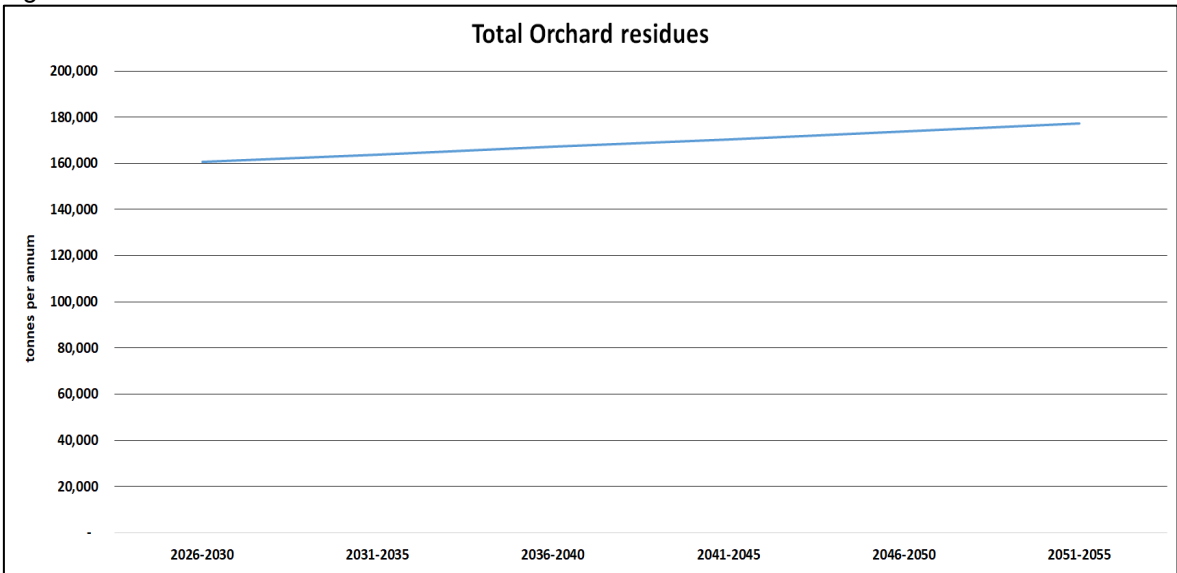
Figure 8 – Port bark by port



Orchard residues

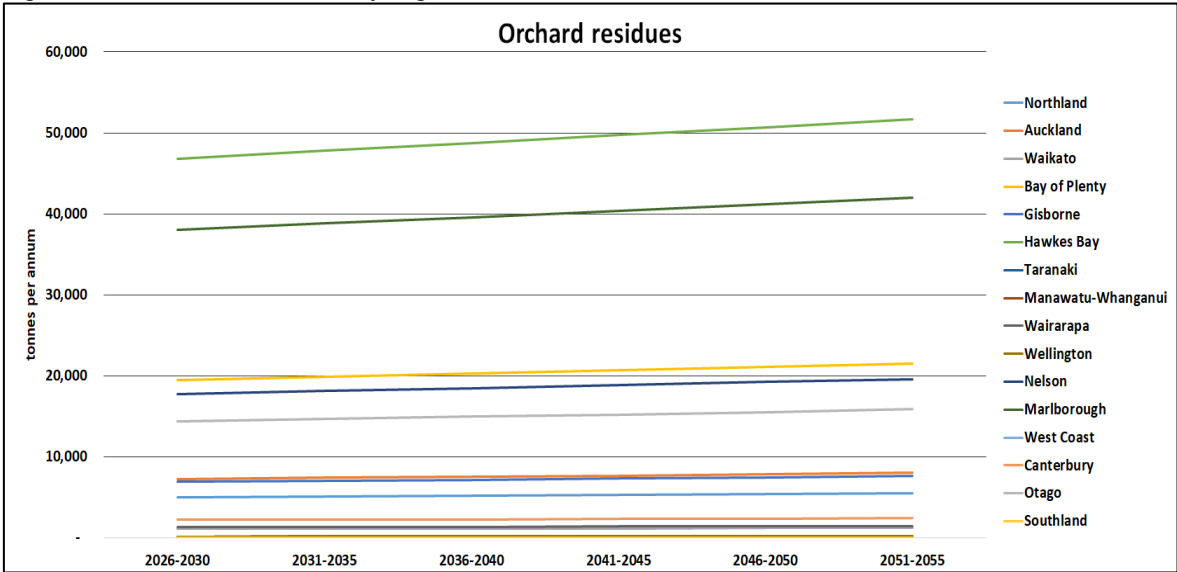
Orchards and vineyards produce woody debris from turn-over of over-mature trees and vines (replacing older plants). Figure 9 shows the volume of this material estimated to be available nationally. The increase in volume over time is due to anticipated increase in area of land used for orchards and vineyards.

Figure 9 – National total orchard residues



The regional availability of orchard residues is shown in Figure 10. Regions with large areas of fruit and grape growing (Hawkes Bay, Nelson, Gisborne, etc.) have higher volumes than some other regions (West Coast, Southland).

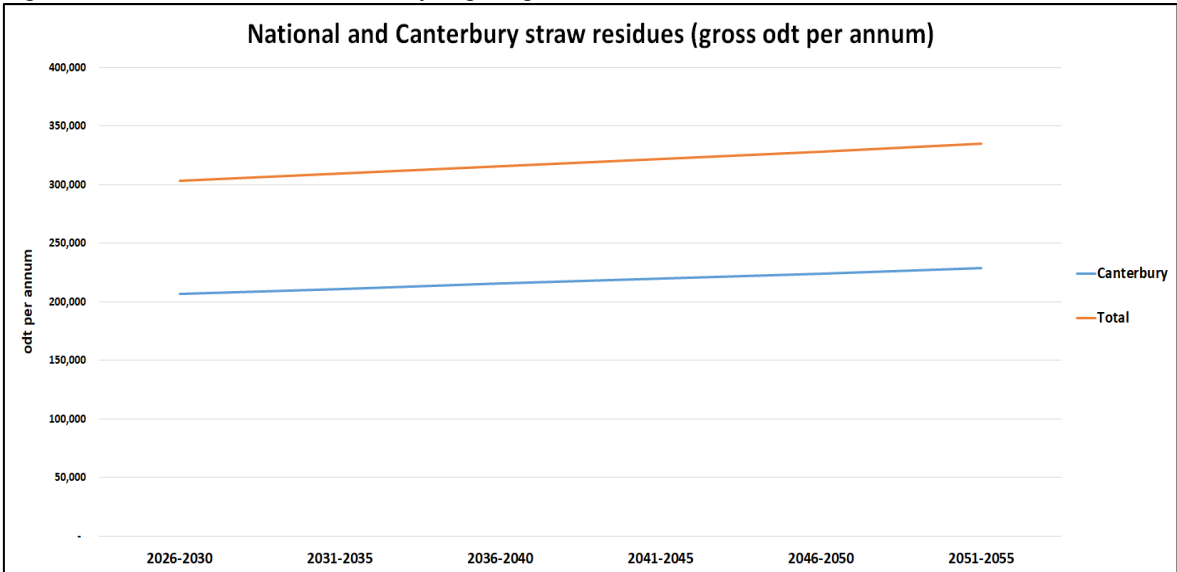
Figure 10 – Orchard residues by region



Agricultural residues (Straws and Stover)

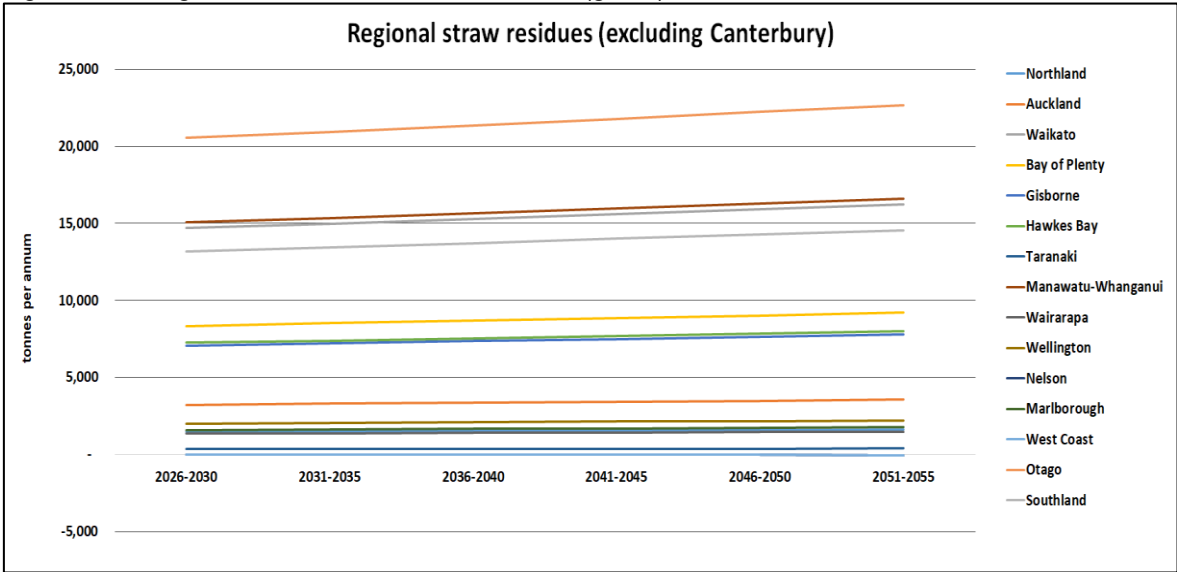
The amount of straw and stover residues potentially available nationally and in Canterbury are shown in Figure 11. Canterbury is included with the national figure as this region has around 70% of the national area under arable crops such as wheat, barley and oats. This figure is the amount that is sustainably recoverable allowing for the retention of half the straw on site as carbon and nutrients for the next crop.

Figure 11 – National and Canterbury region gross straw residue resource



The regional availability (excluding Canterbury) of straw and stover residues is shown in Figure 12. In the North Island the resource is skewed towards corn stover, with much less wheat and barley straw. This estimate does not include maize silage, only the stover residue from corn cropping.

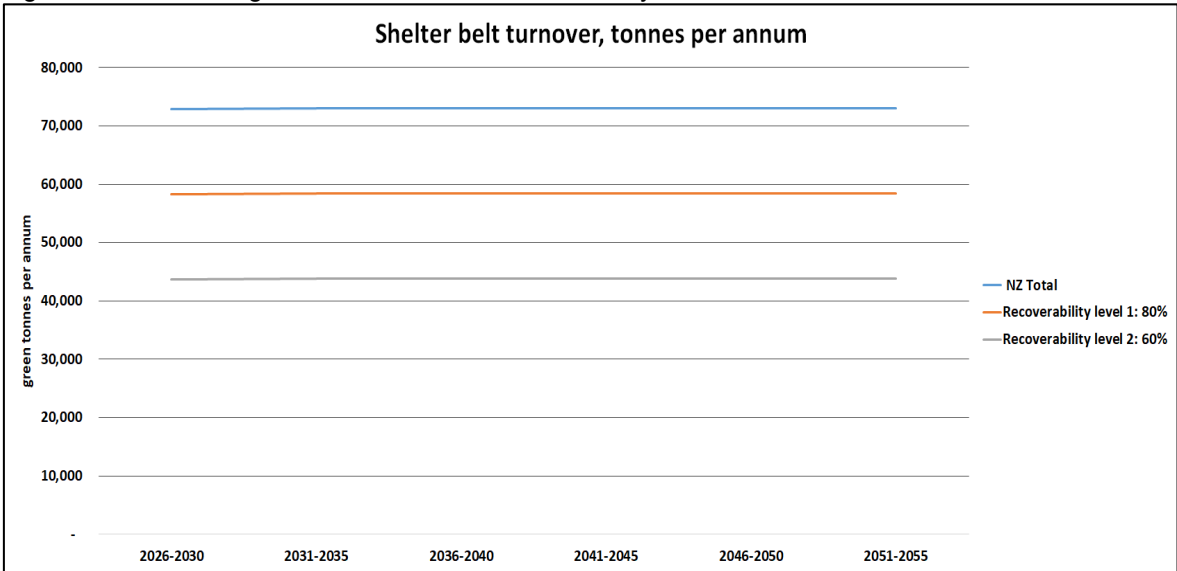
Figure 12 – Regional straw and stover resources (gross).



Shelter belt residuals

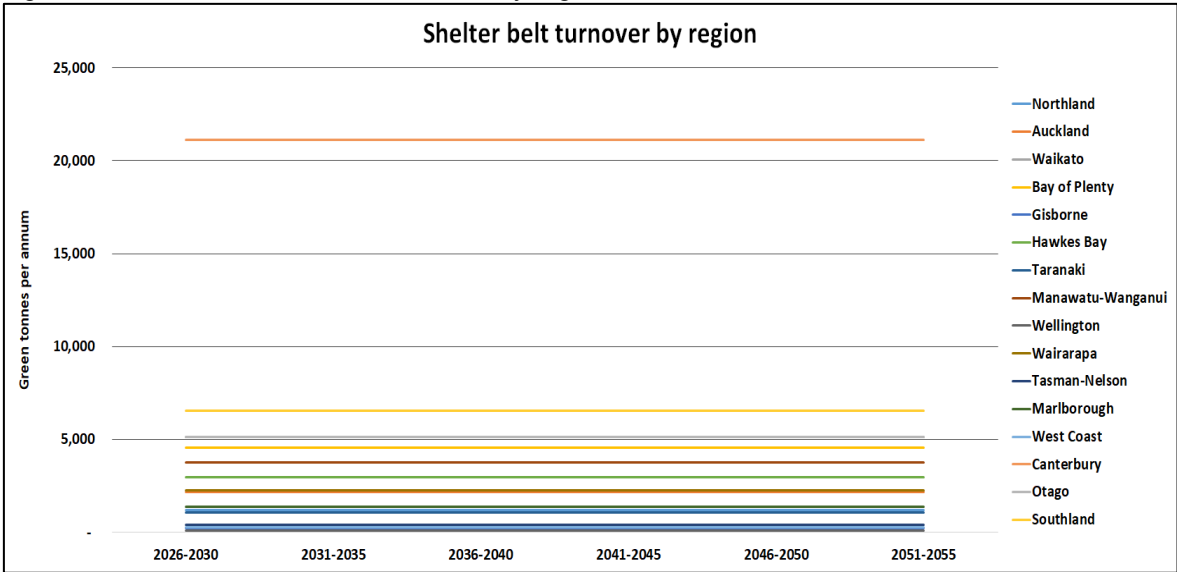
The gross volume of material available from shelterbelt turnover / replacement is shown in Figure 13, along with estimates of the volumes available at recoverability rates of 80 and 60%.

Figure 13 – National gross volume and at recoverability rates of 80 and 60%



The volume of shelter belt turnover residues by region is shown in Figure 14. Canterbury has significantly more of this potential fuel resource than any other region.

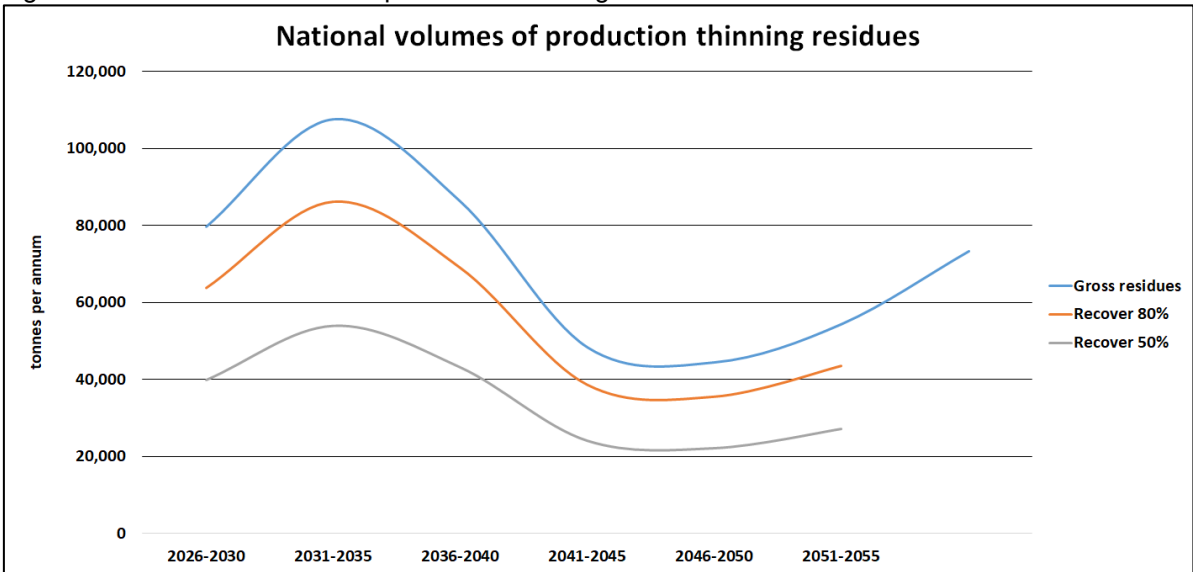
Figure 14 – Shelter belt turnover residues by region



Production thinnings residuals

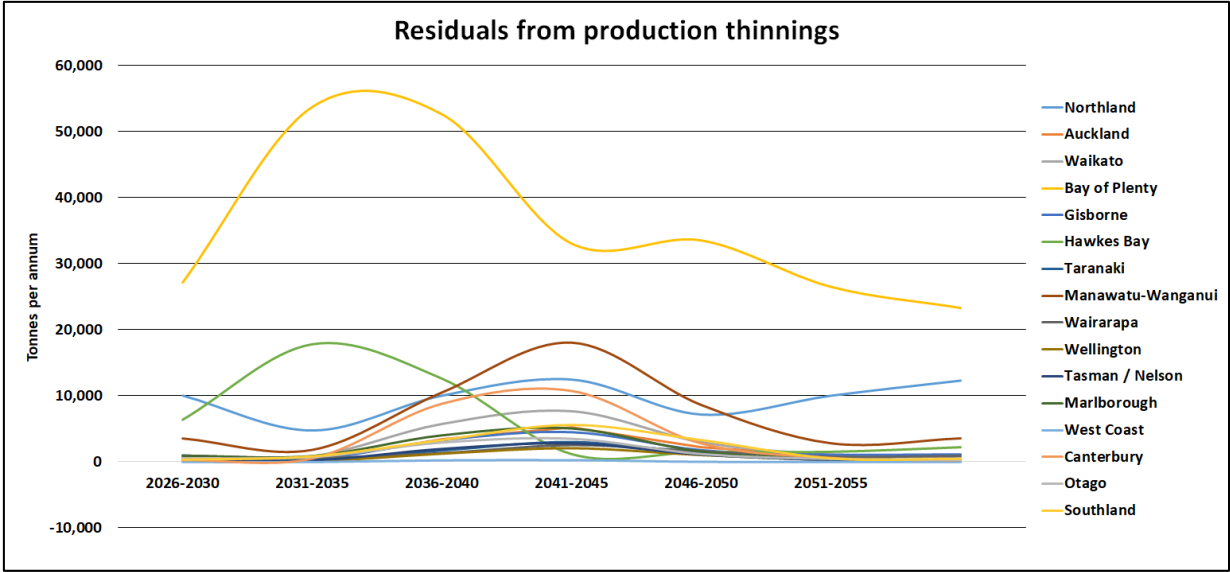
The volume of residues from this source is peaky due to the age class distribution of the forests and changes in regimes used, with less production thinning occurring currently than has been the case historically. We have assumed the same pattern of production thinnings going forward into the future as the changes in production thinning volumes may be dictated by the slope of the land being harvested, with changes to harvests off steeper land on the increase, reducing the amount of area viable for production thinning. The ability to smooth the supply from this resource by delaying or bringing forward operations is much more limited than with clear-fell operations. The gross volume of residuals from production thinnings is shown in Figure 15, along with volumes assuming recovery rates of 80 and 50%.

Figure 15 – National volumes of production thinnings residues



The volume of production thinnings by region are shown in Figure 16. The Bay of Plenty region has the largest volume of this material.

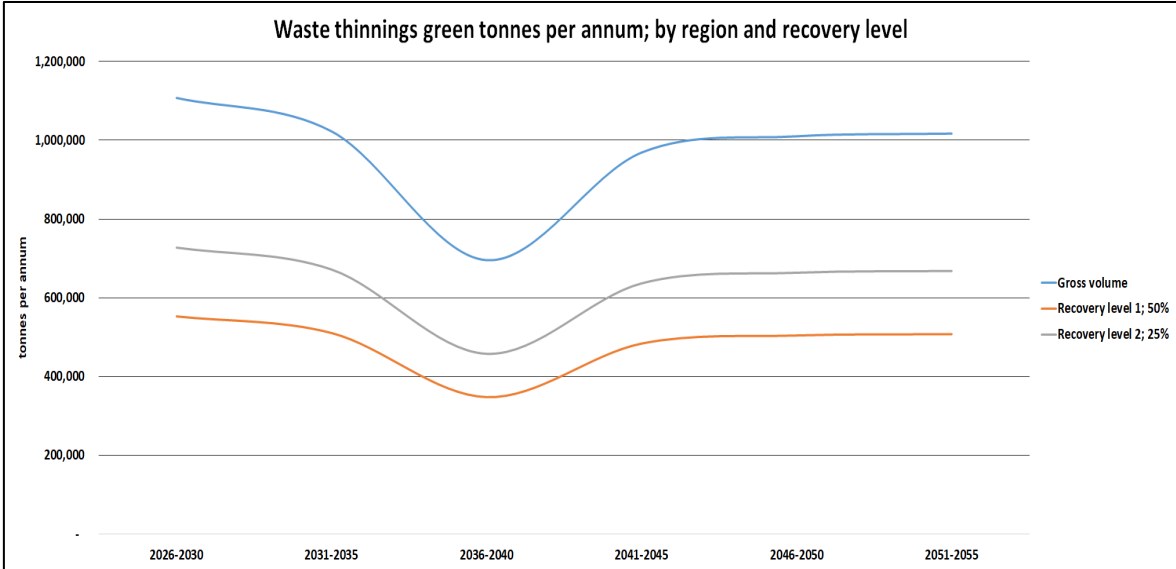
Figure 16 – Production thinnings residue volumes by region



Waste thinnings

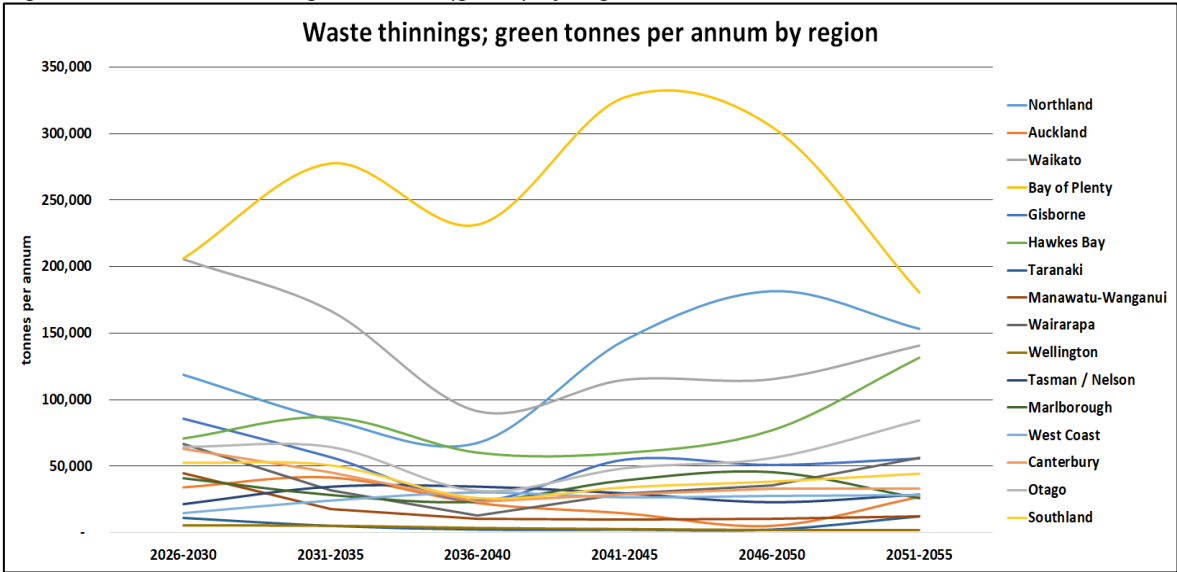
Much of this material would be difficult to recover with modest volumes per hectare, spread over a large area. The recovery levels of this material may well be much lower than for other more accessible residues. The estimated gross volume available nationally, along with the volumes from 50% and 25% recovery are shown in Figure 17.

Figure 17 – National levels of waste thinnings, gross and at 50% and 25% recovery levels



The gross amounts of waste thinnings by region are shown in Figure 18. The largest volume is available in the Central North Island (Waikato and Bay of Plenty). The CNI has around 30% of New Zealand's plantation forests by area.

Figure 18 – Waste thinnings volumes (gross) by region



Prunings

The volume of biomass estimated to be available national from pruning of *Pinus radiata* forests is shown in Figure 19. This material is likely to be difficult to access and expensive to extract in many stands, especially those on steep slopes. The variation in the volume of supply is due to changes in forestry practices, with less area of forest being reported as being planned for a regime that includes pruning (MPI, 2025).

Figure 19 – Pruning residuals, national level

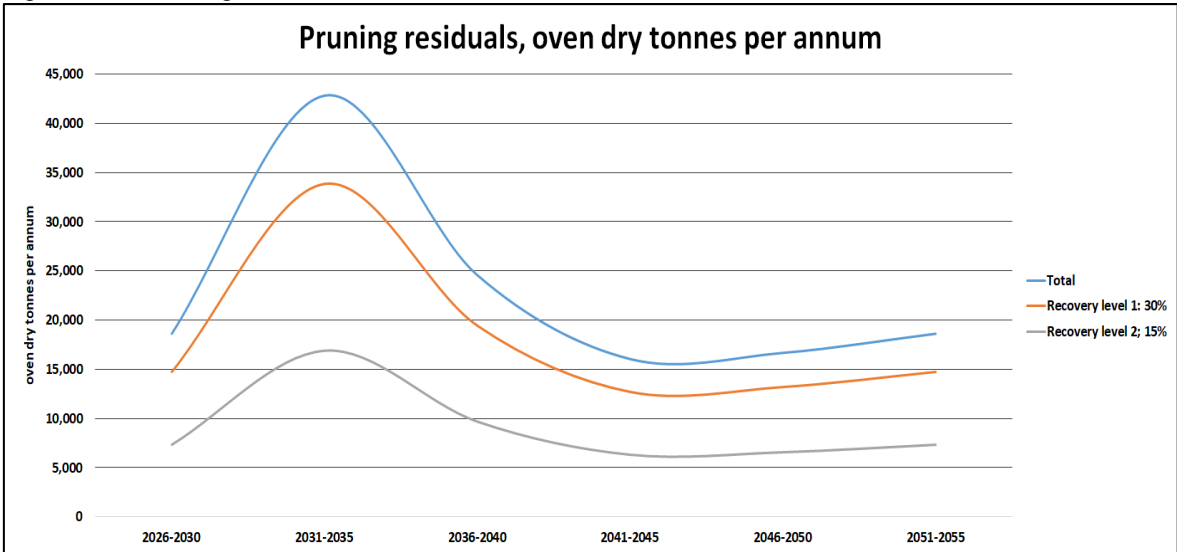
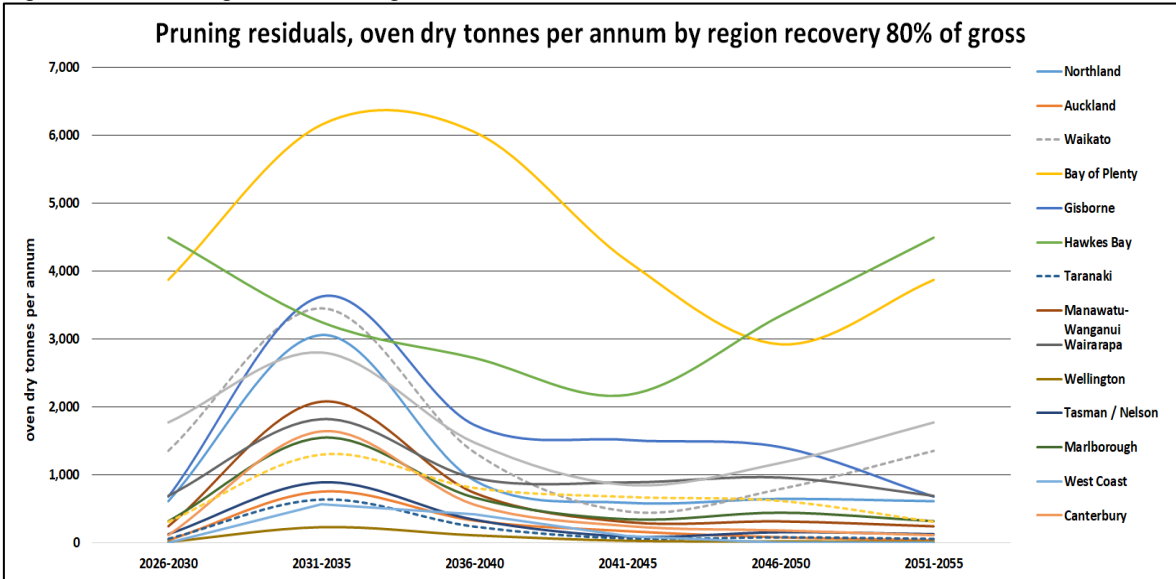


Figure 20 shows the estimated pruning resource by region. This resource has potentially low estimates in the future – but this depends on decisions around pruning that may change in the future.

Figure 20 – Pruning residuals, regional level



Pulp logs

The gross volume of pulp logs produced in New Zealand is shown in Figure 21 (blue line). This volume is for all pulp logs produced and does not allow for the current use of these logs by existing users such as pulp mills and MDF plants. The orange line shows the amount estimated to be available after incumbent users (pulp mills, MDF mills etc.) has been accounted for. The amount of material taken by incumbent users may change over time as mills close or configure their operations.

Figure 21 – Gross volume of pulp logs produced in New Zealand

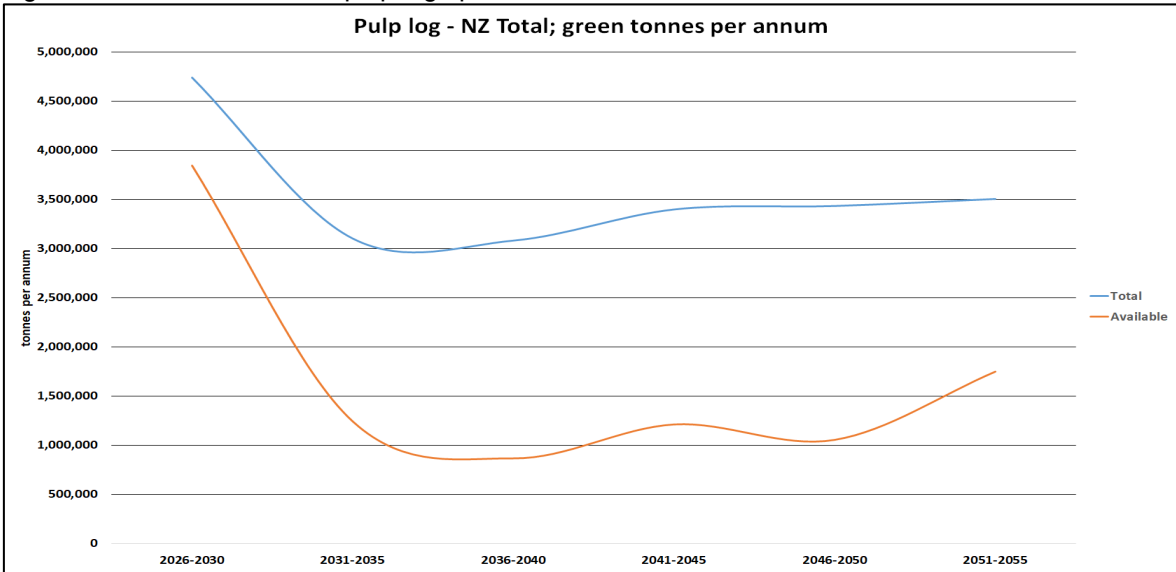
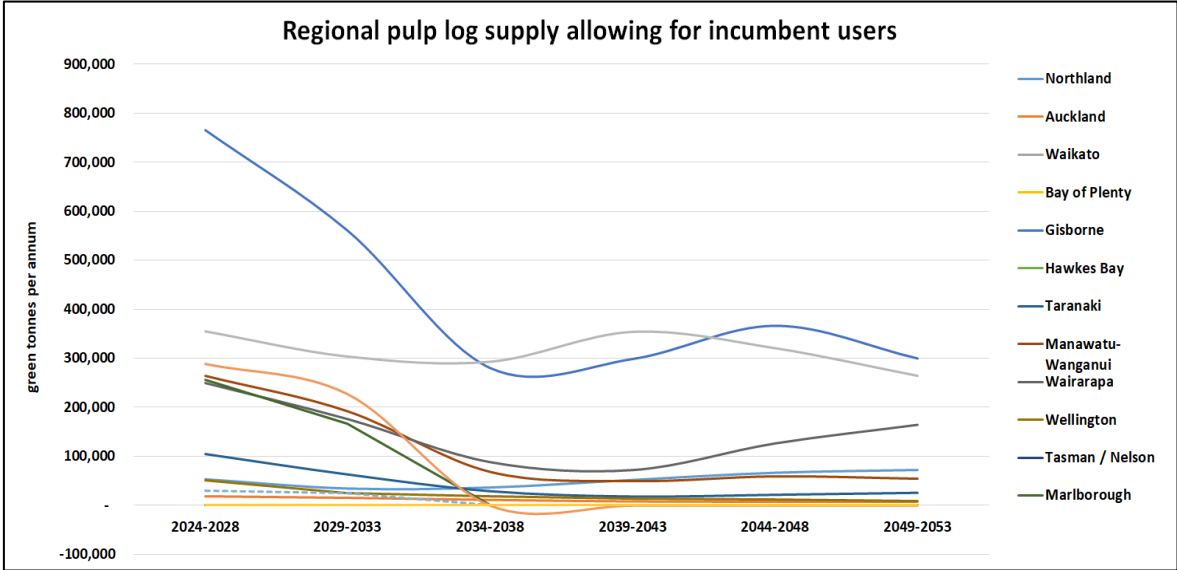


Figure 22 shows the amount of pulp logs available by region after the use by incumbent mills is allowed for. Gisborne has the largest volume of any region, as there are no incumbent users.

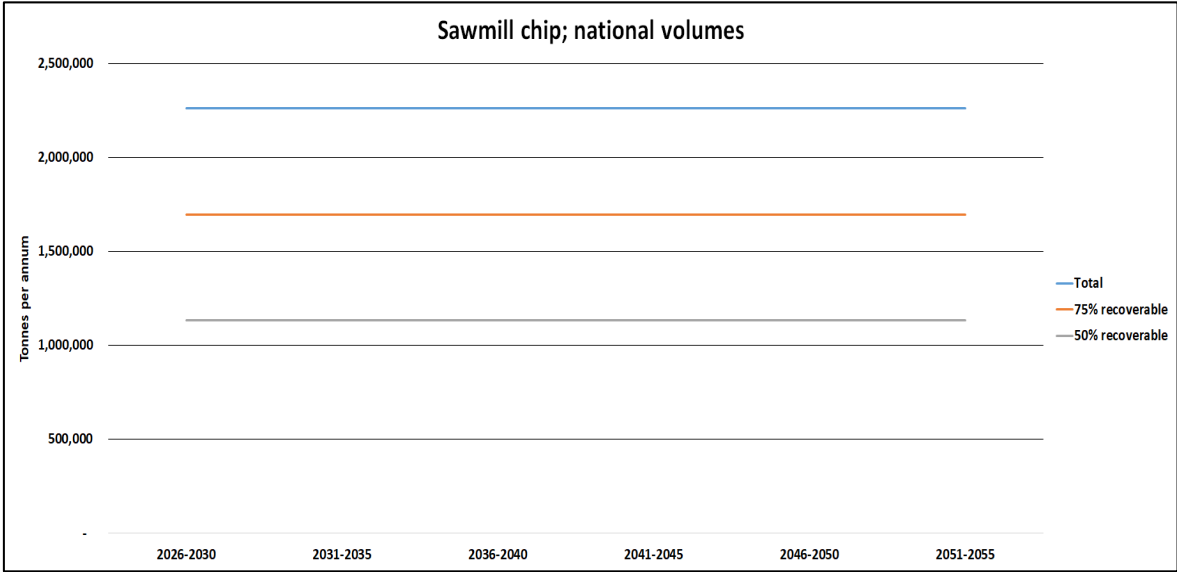
Figure 22 – Regional volume of pulp logs estimated to be available



Sawmill chip

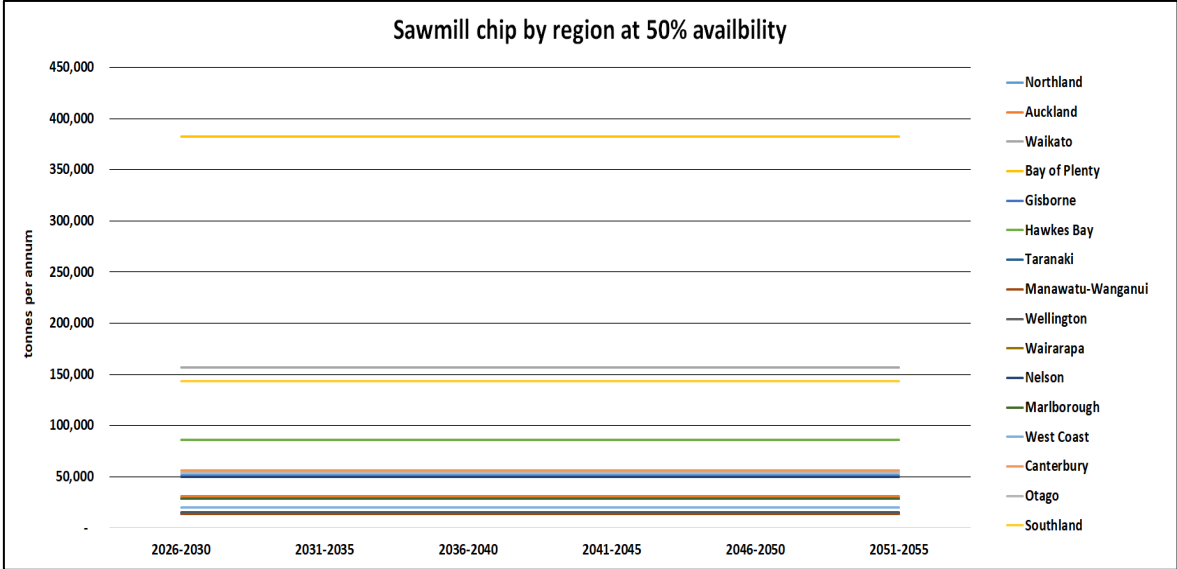
The gross amount of sawmill chip available in New Zealand is shown in Figure 23, along with figures assuming either 75% or 50% being available for purchase. These figures do not allow for the volume going to incumbent users such as pulp and MDF mills. Closure of sawmills since the last report have been accounted for. Projections are all flat lines as closures and expansions are not predictable.

Figure 23 – National gross volume of sawmill chip



The data in Figure 24 shows the volume of sawmill chip available by region, assuming that 50% of the gross is available. Most of the sawmill chip currently produced has a market in either pulp, paper (Central North Island, Hawkes Bay), MDF (Southland, Canterbury & Nelson), particle board (Northland, Central North Island) or as export chip (Northland). However, from a sawmill chip producers' point of view the critical point is having a market rather than the type of end-use and there is anecdotal evidence of fuel users expressing an interest in sawmill chip as a fuel. As carbon prices rise, this option becomes more viable.

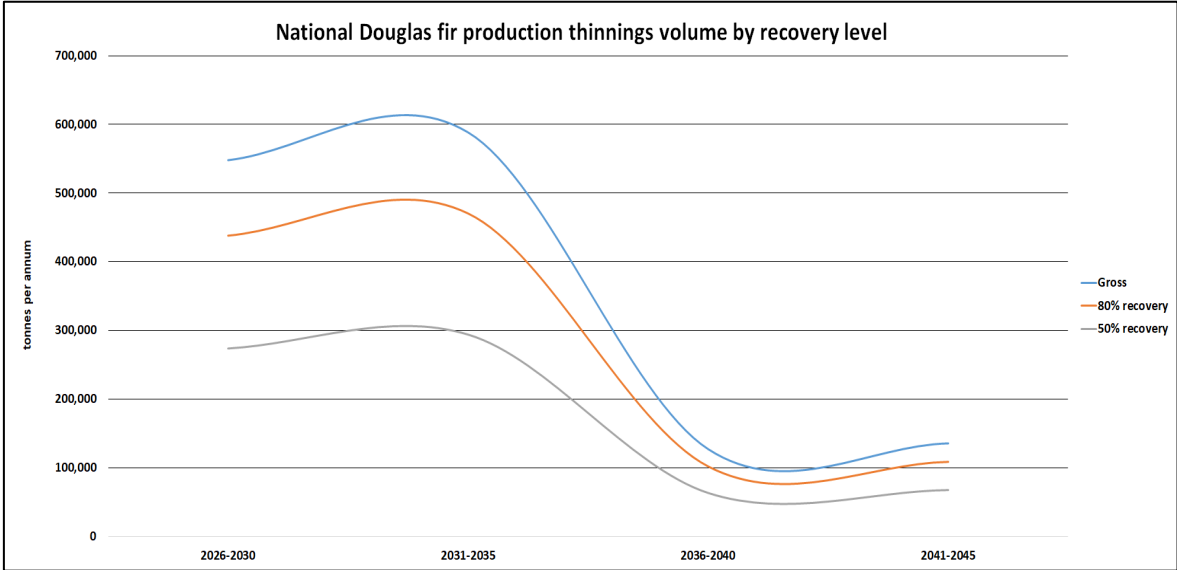
Figure 24 – Regional volume of sawmill chip assuming 50% recovery



Douglas-fir production thinnings

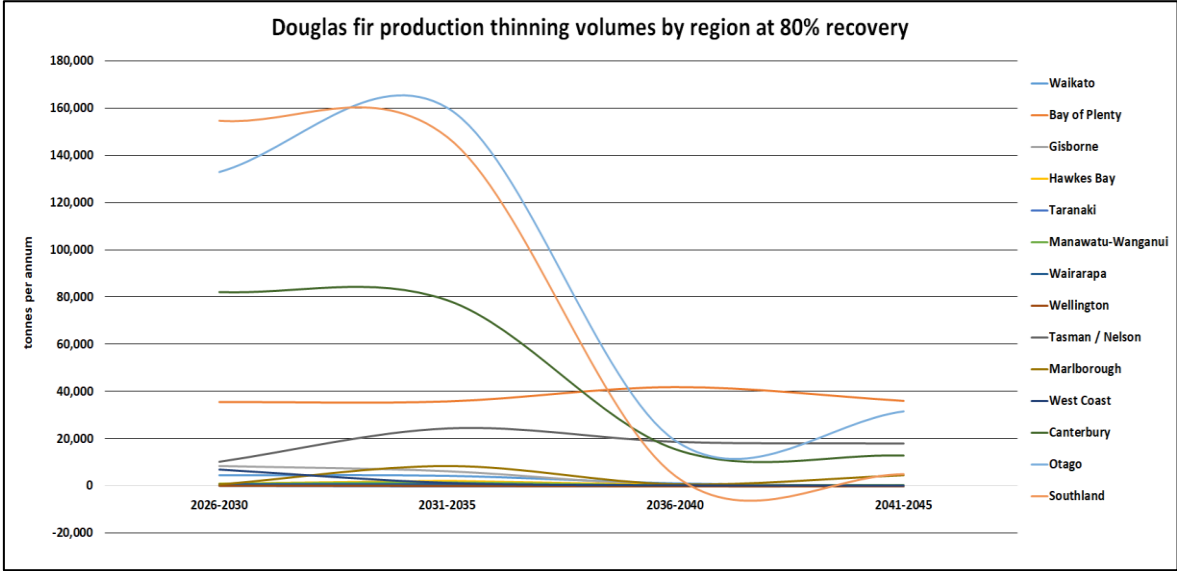
Douglas fir production thinnings were not previously reported. This resource is mostly in the South Island and is likely to be a short-term option as plantings of Douglas fir that had expanded during the 1990s and 2000s have declined due to concerns over the spread of wildings. There is a limited market in traditional solid wood processing for the small logs from the Douglas fir thinnings. They are not a preferred feedstock for MDF. The national level values of this resource are shown in Figure 25.

Figure 25 – National volumes of Douglas-fir production thinnings



The regional volumes of Douglas fir thinnings are shown in Figure 26. The bulk of this resource is in Southland, Otago and Canterbury. The only region in the North Island with a significant amount of Douglas fir is Bay of Plenty. The North Island volume is expected to continue to decline in the long term as few forestry companies are replanting sites that had Douglas fir with that species.

Figure 26 – Regional volumes of Douglas-fir production thinnings

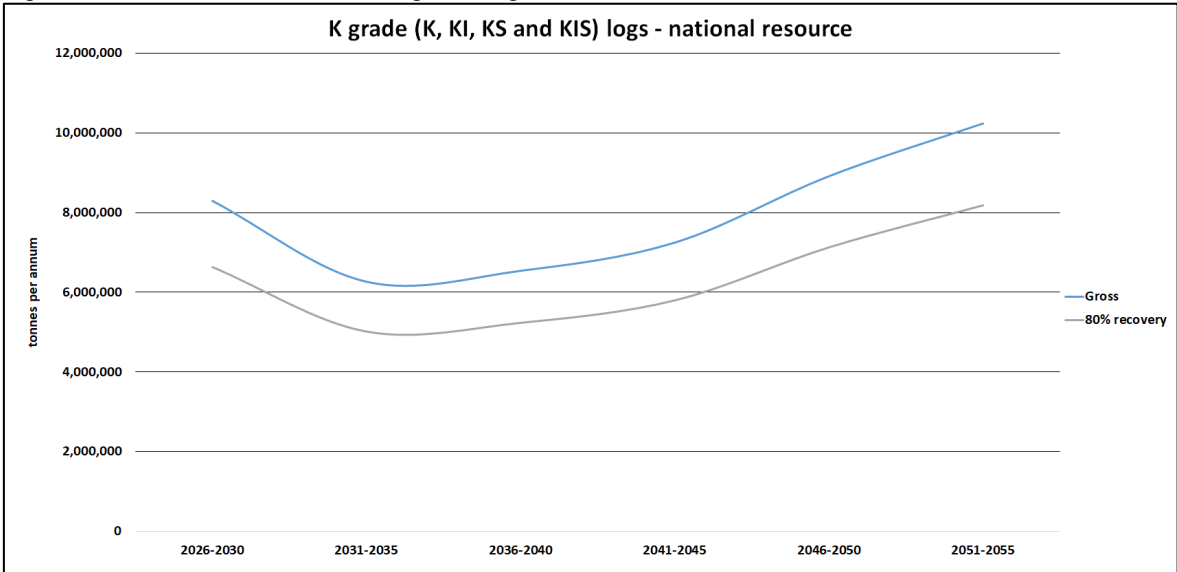


K grade logs (includes K, KI, KS and KIS)

K grade logs are small diameter, short length, knotty logs. KIS are the lowest value of the sawlog grades (see Table 2). Most of this resource gets exported as raw logs, much of it to China. There are few processors using this material in New Zealand. Potentially this material could be used as a fuel resource depending on the price of the logs and the impact of the price of carbon on coal users.

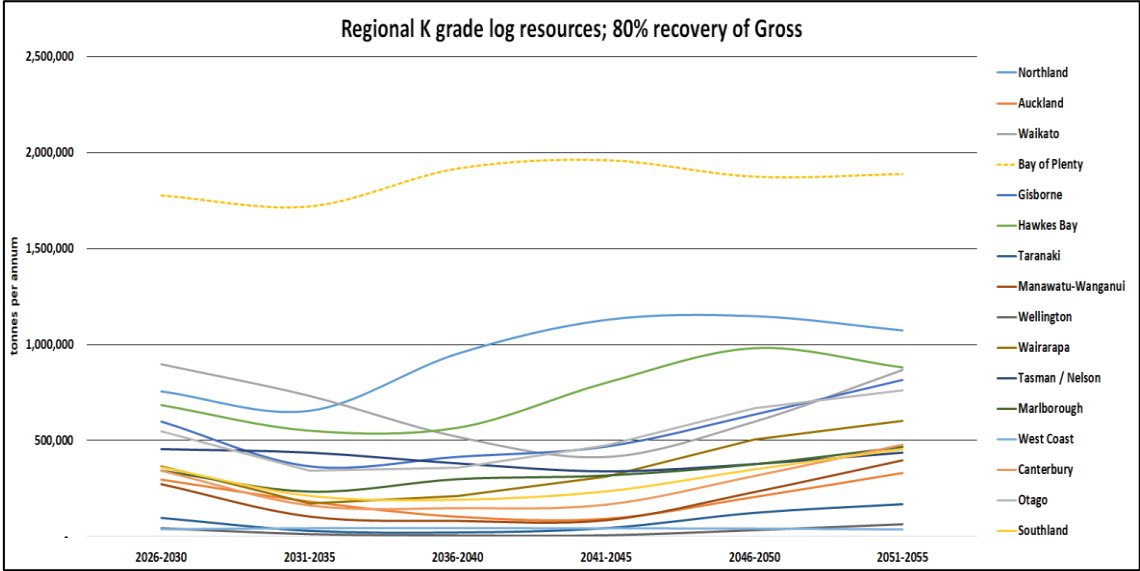
The national volume of K grade logs (combination of the 4 subgrades) potentially available, including availability for purchase levels of 75% and 50% are shown in Figure 27. These volumes are substantial, being several million tonnes per annum, regardless of scenario or timing. The maximum long run volume is around 5.5 million tonnes per annum, with a low point in supply around 2031 to 2035.

Figure 27 – National volumes of K grade logs



The regional volumes of the K grades log resource likely to be available over time are shown in Figure 28. The largest resource is in the Bay of Plenty (around 1.8 million tonnes per annum). However, even in many of the regions with smaller volumes the scale of this resource is still in the order of 150,000 to 200,000 green tonnes per annum.

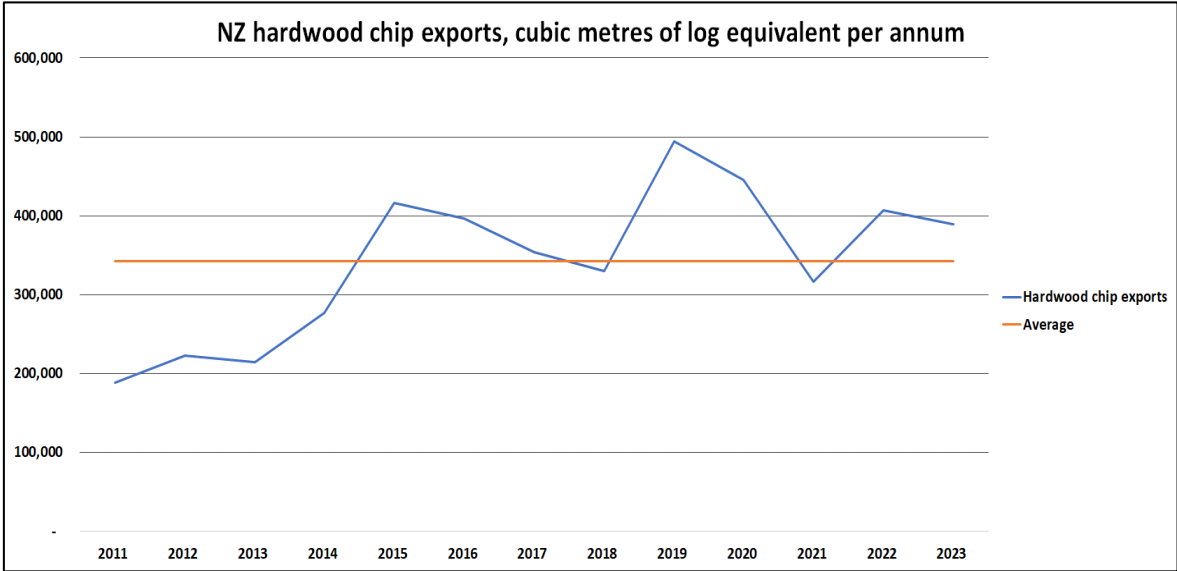
Figure 28 – Regional volumes of K grade logs



Short Rotation Forest (SRF) resources

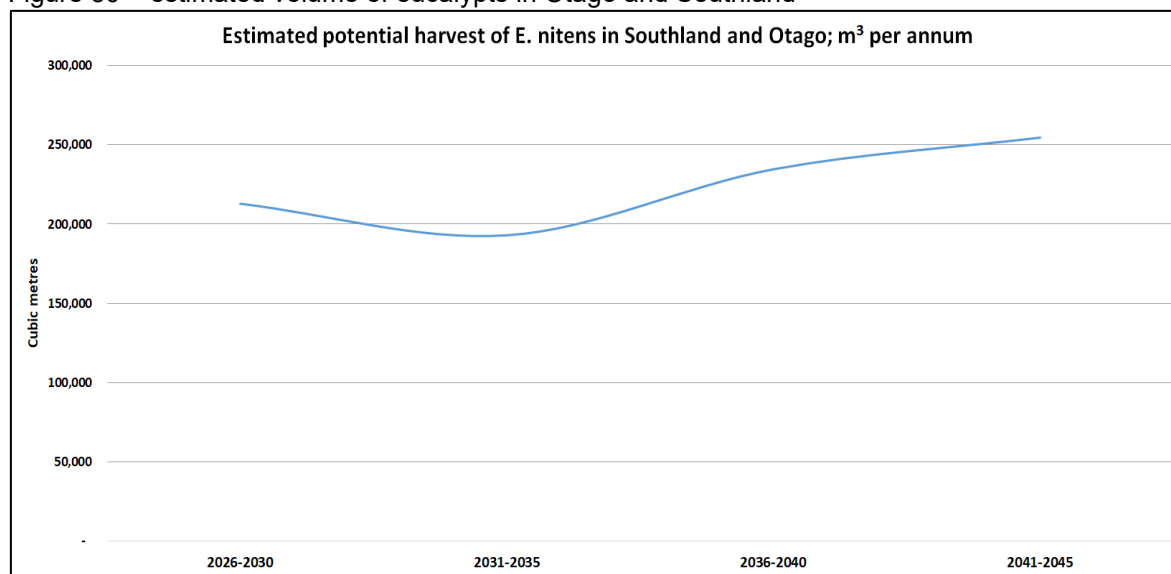
There is a potential energy resource in Otago and Southland that comes directly from a crop, not as a residual. This is the *Eucalyptus nitens* resource managed by Southwood Exports. There is around 12,300 ha of this species in Southland and Otago. The trees are grown at high stockings for around 18 years. The logs produced are largely debarked at harvest then chipped at Awarua and exported via the port at Bluff. Data available from the MPI website on export volumes presented in Figure 29. Prices have ranged from \$81 to \$95 per cubic metre of log equivalent over the last 5 years. The chip mill has a single shift capacity of 320,000 green tonnes per annum. This material could also potentially be available as a wood fuel resource if circumstances (demand and price) change. The average volume produced from this resource is 342,000 m³ per annum.

Figure 29 – Hardwood chip exports



This resource represents a wood energy resource of around 200,000 to 250,000 green tonnes (1.6 to 1.9 PJ of energy) per annum at around \$16 to \$17 per GJ at the chip mill (Figure 30).

Figure 30 – estimated volume of eucalypts in Otago and Southland



New short rotation forests are not included here but could be used to expand the supply of biomass for bioenergy. Modelling of the potential for SRF forests and future supply based on them is possible using GIS based models.

Stumps

This assessment of the volume of wood available from stumps is not advocacy for the use of stumps as a fuel or biorefinery feedstock.

It is included for completeness of the data set and in recognition of the fact that there is some interest in the stump resource for resin extraction with the resin extracted wood being used as a fuel.

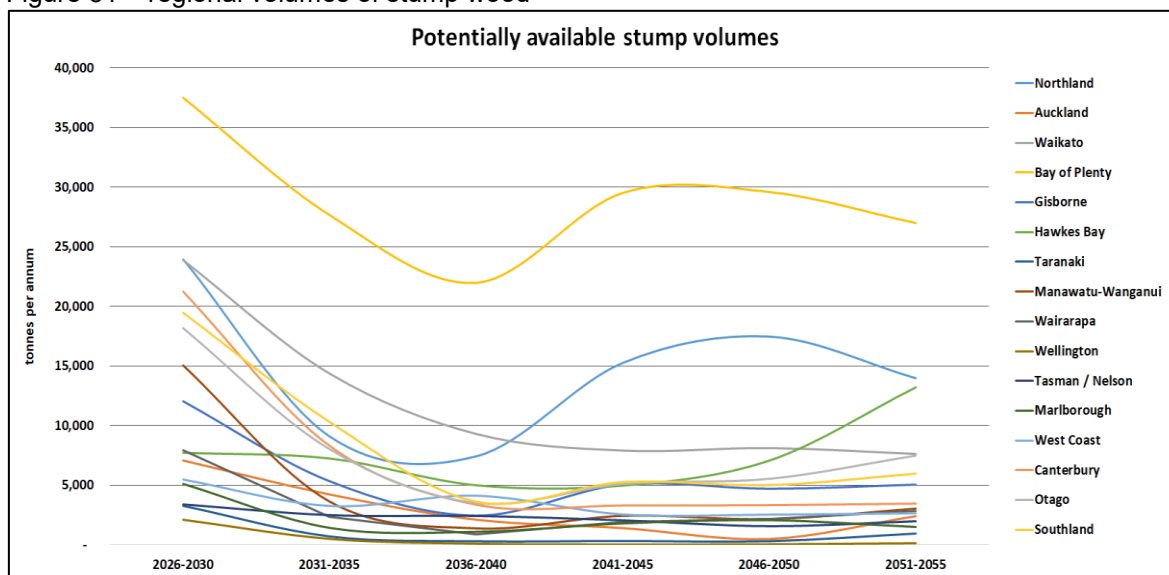
The gross volume of stump wood associated with the current annual harvest could be in the order of 3.5 million m³ per annum. However, not all of this volume should or could be harvested. In this assessment we assume that any harvest area that would require cable logging will be unsuitable for stump harvesting.

Further we assume there will be a limit on the proportion of stumps extracted from a given site, with a maximum of 1 stump in every 4 (spread evenly across the cutover) being available for extraction.

Additionally, it is assumed that not all growers would want their cutovers subject to stump removal, so only half of the area that meets the ground-based harvest criteria would be made available.

After applying these assumptions, the national volume available in the long run is approximately 83,000 m³ per annum in the long run. Regional amounts are shown in Figure 31.

Figure 31 – regional volumes of stump wood



A grade logs

A grade logs are larger diameter than K grade, with smaller knots. While some are processed in New Zealand, significant quantities are exported due to the large volumes grown. The pricing of these logs means they would be at the top of the price range with a delivered cost of around \$115 to \$120 per green tonne (\$17 to \$18 per GJ), excluding chipping (likely around \$2.00 per GJ).

The total volume of A grade logs is estimated in Figure 32, and in the long run is around 7 million m³ per annum. The amount that would potentially be available at a regional level if it is assumed that only 50% of the cut volume is available is shown in Figure 33.

Figure 32 – National total volume of A grade logs

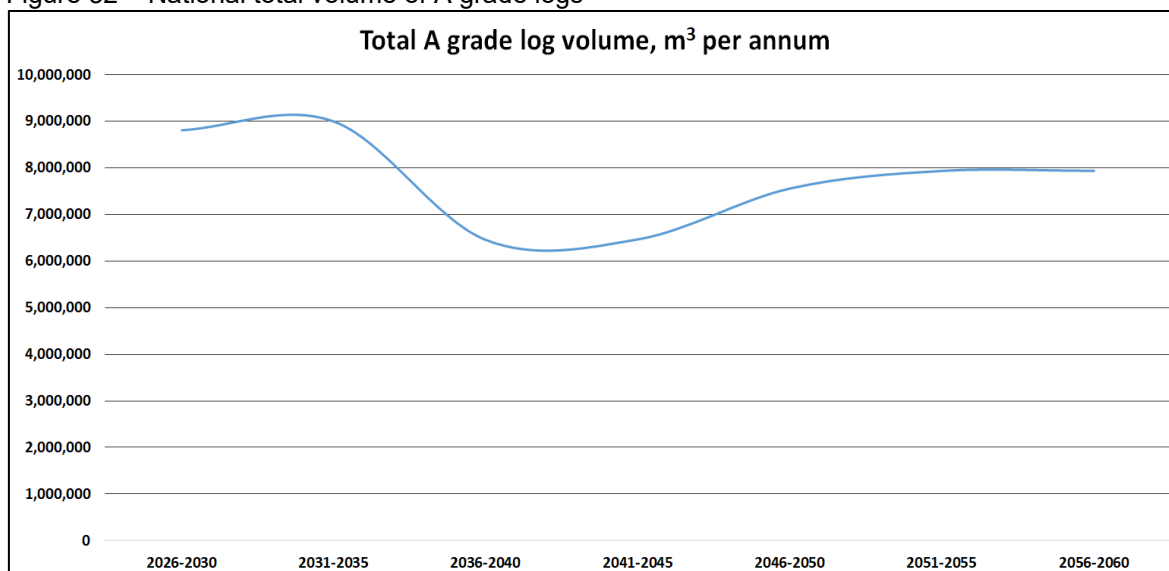
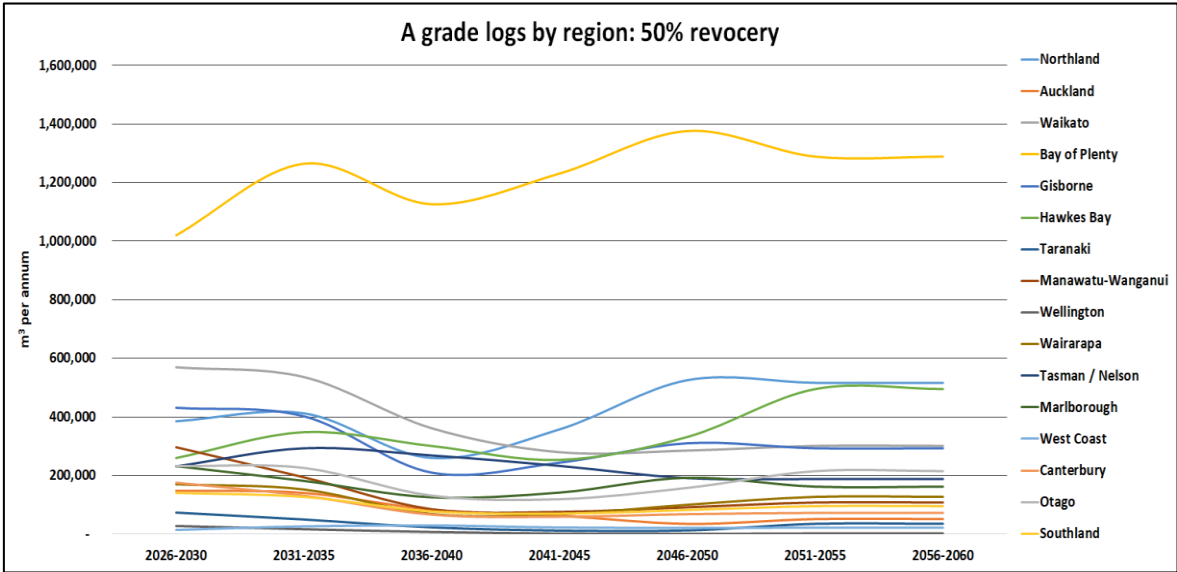


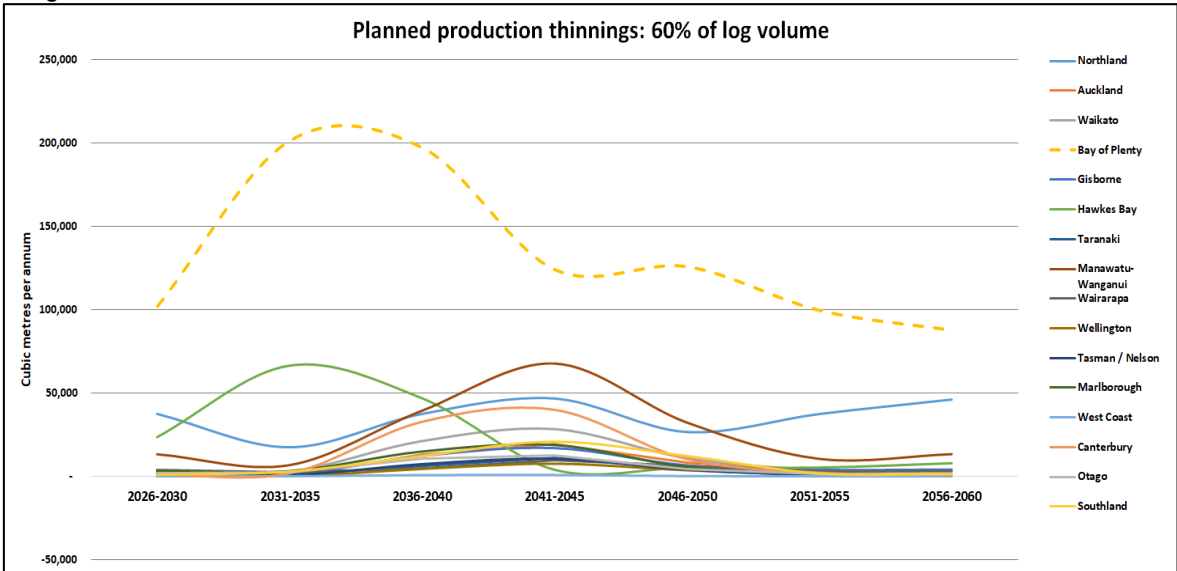
Figure 33 – Estimate of the regional volumes of A grade logs assuming 50% of the gross volume is available



Planned Production thinning log volumes

Where production thinnings are practised in New Zealand, on around 11% of the planted radiata pine forest, the logs are typically used for posts, poles, MDF mill feedstock and pulp mill feedstock. However, there could be more use of this material for energy if the price was sufficient to cover the harvesting and transport costs. It is also a way of getting more biomass out of the forests if there is a demand in a specific region. An estimate of the volume of logs from current production things assuming 60% availability of the harvest volume is shown in Figure 34.

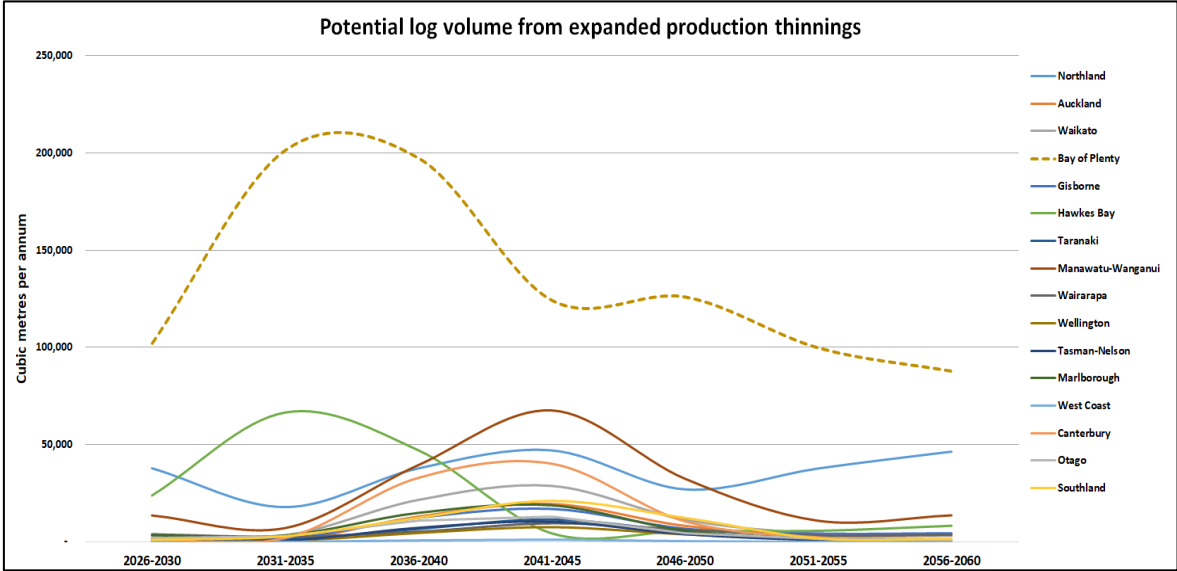
Figure 34 – Estimate of the regional volumes of logs from production thinnings, assuming 60% of the gross volume is available



Expansion of production thinnings

There is potential for production thinning to be applied to more area than it currently is. An estimate of this area was made based on analysis of age class, regime and slope. If the area suitable for a mechanised production thinning based on slope being less than 19 degrees was thinned, then a greater volume of wood could be sourced. This could be helpful, as above, to meet specific regional demands without expanding the forest area. The volume of material that could be derived from this source is shown in Figure 35 and in greater detail in Appendix K.

Figure 35 - Expanded production thinning volume by region over time, 60% of gross volume



Discussion

Outside of the residual, sawmill chip, export chip and log resources covered above there is potential to grow biomass for fuel from non-traditional forestry regimes. These approaches include short rotation coppice of willow and poplar. There are no commercial areas of this type of material in New Zealand, but there have been trials. The potential from this route is out of the scope of this report.

Short rotation forestry (SRF) without coppicing is also an option. The amount of wood from existing SRF is covered in this report (Pages 37-38).

Current wood fuel demand for large scale (< 1MWth) heat plant.

There are several heat plants around New Zealand that have made a change in the recent past to using wood as fuel. Generally, the displaced fuel has been a fossil fuel, and many have been coal boilers.

Schools have been a common source of change in boiler fuel use and now use around 17,000 tonnes per annum. Individually their demands are quite small as their heating season is short and the boilers are often small (less than 1MWth)

Based on information that is publicly available (industry newsletters, company announcements, published case studies, news media etc.) and from industry contacts, an estimate of wood fuel use by region is presented (Table 7). This data excludes the wood processing industry which largely consumes its own residuals. It indicates that around 843,000 green tonnes per annum (at least) of wood residuals being used as fuel. This list is not believed to be fully complete and further work on expanding this dataset is planned. There are some further wood fuel plants being built or commissioned that are not included in the data as they are not yet operating; for example, the second wood fuel boiler at the OFI dairy factory in Tokoroa, Waikato.

Table 7 –wood fuel use by region (non-wood processing) greater than 1 MWth

	Green tonnes per annum equivalent	PJ per annum
Northland	55,000	0.38
Auckland	4,000	0.02
Waikato	312,000	2.15
Bay of Plenty	28,000	0.19
Gisborne	2,000	0.01
Hawkes Bay	22,000	0.15
Taranaki		
Manawatu-Wanganui	2,000	0.01
Wairarapa		
Wellington		
Tasman-Nelson	2,000	0.02
Marlborough	16,000	0.11
West Coast		
Canterbury	131,000	0.90
Otago	265,000	1.83
Southland	6,000	0.04
Total	843,000	5.82

The list in Table 7 excludes the wood processing industry.

Wood processing around New Zealand is the largest user of wood fuels and an estimate of this is that around 2.6 million green tonnes of wood fuels are consumed per annum at around 128 sites with around 895 MWth total installed capacity.

This material is typically sawdust, shavings, bark, sander dust, off-cuts, trim and broken or reject product etc.

This volume of consumption indicates that the use of wood as fuel is well established and has been extensively by the wood processing industry for decades. The technology can easily be used in other industries that have demands for medium and high temperature process heat.

Conclusions

There are many sources of residual woody biomass that could provide a low carbon fuel; in-forest post-harvest residues being the largest source. However, shelterbelt replacement, orchard turnover, municipal wood waste, straws, bark, wood processing residues, waste thinnings, and prunings from plantation forests etc. are also available. Further there are other resources such as sawmill chip, pulp logs, hardwood chip and K grade logs which are typically used domestically or exported but which based on current pricing could reasonably be used as wood fuels.

Residuals based on plantation forests are the largest source of residual material.

K (especially KIS) and A grade logs are potentially a very large source of wood fuel.

Straws are a substantial potential fuel source in Canterbury. Operations and studies overseas and in New Zealand indicate that specialist straw boilers will be required to use this material as fuel.

Orchard residues are potentially significant in regions with large horticulture and viticulture industries (Hawkes Bay, Gisborne, Marlborough, Tasman).

In the long run a mid-range (recoverability level 1) estimate of woody biomass supply is up to 7.6 million green tonnes per annum. If pulp logs, K grade logs and sawmill chip are excluded then the supply potential drops to around 3.5 million green tonnes per annum. The national level of biomass supply by resource and over time (2021 to 2050) is shown in Table 8.

Table 8 – National potential supply of woody biomass fuels; green tonnes per annum.

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
All in-forest post-harvest residues	2,675,000	1,916,000	1,946,000	2,092,000	2,145,000	2,180,000
Thin to waste residuals	210,000	194,000	132,000	184,000	192,000	193,000
Production thin residues	64,000	86,000	69,000	39,000	36,000	43,000
Production thin volume	466,000	500,000	108,000	115,000	-	-
Prunings	9,000	21,000	12,000	8,000	8,000	9,000
Port bark	226,000	203,000	192,000	226,000	226,000	226,000
Wood processing residues	-93,000	-93,000	-93,000	-93,000	-93,000	-93,000
Municipal wood waste	236,000	253,000	273,000	294,000	317,000	343,000
Orchard & vineyard	129,000	131,000	134,000	136,000	139,000	142,000
Straw and stover	295,000	301,000	307,000	313,000	319,000	325,000
Shelter belt	58,000	58,000	58,000	58,000	58,000	58,000
Pulp (exc. incumbent use)	2,530,000	1,861,000	1,060,000	1,098,000	1,199,000	1,108,000
K grade	7,464,000	5,636,000	5,885,000	6,521,000	8,021,000	9,213,000
A grade	7,933,000	8,104,000	5,807,000	5,818,000	6,805,000	7,146,000
Sawmill chip	1,697,000	1,697,000	1,697,000	1,697,000	1,697,000	1,697,000
SRF E. nitens	113,000	104,000	86,000	95,000	60,000	37,000
Total	24,012,000	20,974,000	17,672,000	18,601,000	21,130,000	22,629,000

Another potential biomass resource is stumps (Table 9). However, these are not recommended for use as the environmental and soil impacts of large-scale extraction of these would be considerable, and they are difficult to dig out, making them expensive. Further they come with substantial dirt contamination. There are many other resources we could use.

Table 9 – potential biomass resources

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Stumps	341,000	174,000	110,000	142,000	148,000	159,000

A set of 23 appendices (A to W) show the gross and recoverable tonnages (Levels 1 and 2) and energy contents (gross plus recovery levels 1 and 2) by resource, region and time for all the different resources assessed above.

These resources are based on current forest area and age class data, as well as crop residues.

Establishment of new forests, especially short rotation energy forests could expand the bioenergy supply available in the future. There has been some discussion and investigation of this option and some trial plantings.

Acknowledgements

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This data set relies on the National Exotic Forest description and the associated yield tables and wood availability forecasts provided by the Ministry of Primary Industries Te Uru Rakau.

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Appendix A – All in-forest residues

Gross supply all in-forest residues; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	424,268	199,836	242,253	389,312	405,441	302,141
Auckland	147,160	89,030	48,683	28,905	31,414	78,294
Waikato	532,087	327,748	219,368	216,185	224,603	274,734
Bay of Plenty	994,640	830,948	827,863	978,058	909,539	866,150
Gisborne	427,447	186,324	146,742	216,933	210,204	225,358
Hawkes Bay	247,314	212,598	166,430	198,230	295,717	351,663
Taranaki	82,828	18,911	9,724	10,301	22,999	35,062
Manawatu-Wanganui	255,615	69,716	37,113	43,961	40,534	60,980
Wellington	41,159	9,034	4,672	3,635	3,711	7,242
Wairarapa	259,997	74,837	54,035	93,076	122,526	135,775
Tasman-Nelson	207,535	162,666	148,810	139,791	129,201	162,396
Marlborough	232,748	89,321	95,524	131,878	122,321	87,948
West Coast	54,040	36,755	44,871	33,904	33,893	31,740
Canterbury	302,406	134,696	99,968	92,677	78,150	89,787
Otago	340,940	210,334	179,395	172,554	186,063	208,904
Southland	249,321	183,739	152,179	121,819	104,244	118,908
NZ Total	4,799,503	2,836,492	2,477,632	2,871,219	2,920,562	3,037,083

Gross supply all in-forest residues; GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,927,446	1,378,865	1,671,547	2,686,256	2,797,543	2,084,771
Auckland	1,015,401	614,304	335,913	199,444	216,760	540,228
Waikato	3,671,403	2,261,459	1,513,640	1,491,677	1,549,763	1,895,662
Bay of Plenty	6,863,017	5,733,539	5,712,258	6,748,598	6,275,816	5,976,434
Gisborne	2,949,381	1,285,636	1,012,521	1,496,837	1,450,407	1,554,970
Hawkes Bay	1,706,469	1,466,927	1,148,365	1,367,790	2,040,451	2,426,475
Taranaki	571,512	130,484	67,098	71,075	158,694	241,931
Manawatu-Wanganui	1,763,740	481,041	256,082	303,330	279,685	420,765
Wellington	283,994	62,335	32,236	25,083	25,603	49,968
Wairarapa	1,793,981	516,376	372,843	642,223	845,432	936,849
Tasman-Nelson	1,431,990	1,122,394	1,026,789	964,557	891,485	1,120,535
Marlborough	1,605,962	616,318	659,119	909,961	844,016	606,839
West Coast	372,878	253,606	309,609	233,936	233,863	219,004
Canterbury	2,086,599	929,405	689,780	639,475	539,236	619,534
Otago	2,352,488	1,451,307	1,237,828	1,190,619	1,283,836	1,441,441
Southland	1,720,312	1,267,798	1,050,032	840,550	719,286	820,468
NZ Total	33,116,571	19,571,795	17,095,659	19,811,410	20,151,875	20,955,874

All in-forest residues, m³ per annum at recoverability level 1 (landings 80%, GB cutover 70%, hauler cutover 10%)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	306,259	147,632	184,148	291,319	299,048	220,116
Auckland	106,440	64,461	35,549	20,848	24,305	58,769
Waikato	389,300	240,737	161,608	160,147	166,737	207,839
Bay of Plenty	721,754	602,574	613,947	711,410	662,045	632,722
Gisborne	284,231	123,615	105,790	149,416	145,740	156,205
Hawkes Bay	172,343	147,272	117,160	141,995	213,672	241,538
Taranaki	53,064	12,485	6,703	6,976	17,053	23,663
Manawatu-Wanganui	179,684	49,819	27,385	31,886	29,513	44,498
Wellington	28,592	6,375	3,306	2,566	2,708	5,440
Wairarapa	172,044	50,111	39,467	65,835	87,871	92,867
Tasman-Nelson	136,305	108,686	98,743	94,551	89,749	113,003
Marlborough	144,117	59,474	67,102	90,132	79,951	60,912
West Coast	37,365	25,841	31,485	24,206	24,083	22,408
Canterbury	204,525	94,428	74,148	68,566	56,753	65,627
Otago	221,862	145,602	133,104	122,430	132,958	145,751
Southland	177,210	135,414	117,682	91,629	77,836	88,373
NZ Total	3,335,093	2,014,525	1,817,326	2,073,913	2,110,022	2,179,730

All in-forest residues, GJ per annum at recoverability level 1 (landings 80%, GB cutover 70%, hauler cutover 10%)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,113,184	1,018,662	1,270,622	2,010,102	2,063,430	1,518,801
Auckland	734,435	444,782	245,285	143,853	167,704	405,503
Waikato	2,686,167	1,661,086	1,115,093	1,105,015	1,150,485	1,434,089
Bay of Plenty	4,980,101	4,157,762	4,236,237	4,908,731	4,568,110	4,365,784
Gisborne	1,961,196	852,941	729,949	1,030,971	1,005,603	1,077,813
Hawkes Bay	1,189,164	1,016,177	808,404	979,769	1,474,340	1,666,614
Taranaki	366,143	86,149	46,251	48,131	117,668	163,271
Manawatu-Wanganui	1,239,823	343,749	188,959	220,014	203,638	307,036
Wellington	197,283	43,990	22,808	17,703	18,688	37,539
Wairarapa	1,187,104	345,766	272,319	454,261	606,312	640,783
Tasman-Nelson	940,507	749,934	681,326	652,400	619,271	779,719
Marlborough	994,404	410,368	463,005	621,909	551,661	420,290
West Coast	1,411,219	651,551	511,619	473,105	391,597	452,827
Canterbury	257,815	178,301	217,247	167,023	166,170	154,618
Otago	1,530,846	1,004,652	918,416	844,769	917,410	1,005,679
Southland	1,222,746	934,354	812,006	632,241	537,065	609,771
NZ Total	23,012,138	13,900,224	12,539,548	14,310,000	14,559,153	15,040,137

All in-forest residues, m³ per annum at recoverability level 2 (landings 65%, GB cutover 56%, hauler cutover 5%)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	245,156	118,569	148,506	234,396	240,242	176,596
Auckland	85,329	51,683	28,536	16,707	19,663	47,354
Waikato	312,489	193,321	129,831	128,820	134,149	167,634
Bay of Plenty	579,682	484,277	494,656	572,141	532,268	508,922
Gisborne	227,253	98,813	85,214	119,860	116,982	125,379
Hawkes Bay	138,182	117,977	94,021	114,176	171,939	193,263
Taranaki	42,225	9,961	5,371	5,581	13,768	18,943
Manawatu-Wanganui	143,427	39,855	22,018	25,536	23,646	35,683
Wellington	22,773	5,087	2,621	2,031	2,161	4,373
Wairarapa	137,186	40,015	31,801	52,852	70,670	74,340
Tasman-Nelson	109,112	87,122	79,100	75,863	72,170	90,878
Marlborough	114,749	47,659	54,007	72,383	63,973	48,934
West Coast	29,597	20,537	25,007	19,302	19,198	17,829
Canterbury	162,557	75,365	59,675	55,157	45,548	52,727
Otago	176,321	116,554	107,362	98,310	106,812	116,782
Southland	141,203	108,561	95,103	73,705	62,533	70,952
NZ Total	2,667,239	1,615,358	1,462,829	1,666,821	1,695,720	1,750,589

All in-forest residues, GJ per annum at recoverability level 2 (landings 65%, GB cutover 56%, hauler cutover 5%)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,691,577	818,128	1,024,693	1,617,334	1,657,669	1,218,514
Auckland	588,767	356,616	196,897	115,275	135,676	326,744
Waikato	2,156,174	1,333,916	895,831	888,861	925,625	1,156,674
Bay of Plenty	3,999,804	3,341,513	3,413,130	3,947,772	3,672,647	3,511,562
Gisborne	1,568,048	681,808	587,973	827,037	807,177	865,117
Hawkes Bay	953,453	814,039	648,745	787,811	1,186,378	1,333,512
Taranaki	291,349	68,734	37,060	38,511	94,999	130,706
Manawatu-Wanganui	989,649	275,002	151,927	176,201	163,159	246,210
Wellington	157,135	35,102	18,086	14,016	14,910	30,171
Wairarapa	946,583	276,103	219,425	364,682	487,620	512,948
Tasman-Nelson	752,871	601,142	545,792	523,452	497,972	627,059
Marlborough	791,767	328,846	372,645	499,444	441,414	337,642
West Coast	1,121,641	520,019	411,758	380,583	314,279	363,814
Canterbury	204,219	141,705	172,551	133,185	132,465	123,022
Otago	1,216,612	804,225	740,795	678,339	737,000	805,796
Southland	974,302	749,070	656,208	508,565	431,478	489,571
NZ Total	18,403,950	11,145,968	10,093,517	11,501,068	11,700,470	12,079,063

Appendix B – Municipal Wood Wastes

Wood waste to landfill; gross tonnage, tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	11,851	13,301	14,930	16,758	18,809	21,112
Auckland	90,442	102,427	115,999	131,370	148,778	168,493
Waikato	113,465	122,474	132,199	142,696	154,027	166,257
Bay of Plenty	9,685	10,464	11,306	12,216	13,199	14,260
Gisborne	2,630	2,912	3,225	3,571	3,954	4,379
Hawkes Bay	10,958	11,392	11,843	12,312	12,800	13,307
Taranaki	8,654	8,828	9,006	9,187	9,372	9,561
Manawatu-Wanganui	12,574	12,777	12,982	13,191	13,404	13,620
Wellington	2,802	2,847	2,893	2,939	2,986	3,034
Wairarapa	26,562	28,418	30,403	32,528	34,801	37,232
Tasman-Nelson	14,432	14,612	14,794	14,979	15,166	15,355
Marlborough	4,376	4,765	5,190	5,652	6,155	6,703
West Coast	1,211	1,329	1,459	1,601	1,757	1,929
Canterbury	65,768	68,442	71,225	74,121	77,135	80,271
Otago	15,663	16,940	18,321	19,814	21,430	23,177
Southland	5,433	5,482	5,531	5,581	5,631	5,682
NZ Total	396,504	427,410	461,306	498,517	539,405	584,373

Wood waste to landfill; gross energy, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	95,360	102,121	109,362	117,116	125,420	134,313
Auckland	721,296	816,875	925,119	1,047,706	1,186,538	1,343,767
Waikato	949,426	1,024,814	1,106,188	1,194,024	1,288,834	1,391,172
Bay of Plenty	80,963	87,476	94,514	102,118	110,334	119,210
Gisborne	21,451	23,754	26,304	29,127	32,254	35,717
Hawkes Bay	95,197	98,969	102,889	106,965	111,202	115,608
Taranaki	76,618	78,161	79,735	81,340	82,978	84,649
Manawatu-Wanganui	111,771	113,571	115,399	117,257	119,145	121,063
Wellington	24,910	25,309	25,714	26,125	26,543	26,968
Wairarapa	224,237	239,906	256,669	274,604	293,792	314,321
Tasman-Nelson	128,742	130,349	131,976	133,624	135,292	136,981
Marlborough	36,291	39,522	43,040	46,872	51,045	55,590
West Coast	9,962	10,935	12,002	13,173	14,459	15,870
Canterbury	570,804	594,014	618,168	643,304	669,462	696,684
Otago	130,801	141,466	152,999	165,473	178,965	193,556
Southland	48,628	49,067	49,510	49,957	50,408	50,863
NZ Total	3,326,459	3,576,308	3,849,589	4,148,787	4,476,672	4,836,330

Wood waste to landfill, tonnes per annum, recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	6,757	7,236	7,749	8,299	8,887	9,517
Auckland	51,110	57,883	65,553	74,240	84,077	95,218
Waikato	67,276	72,617	78,384	84,608	91,326	98,577
Bay of Plenty	5,737	6,199	6,697	7,236	7,818	8,447
Gisborne	1,520	1,683	1,864	2,064	2,286	2,531
Hawkes Bay	6,746	7,013	7,291	7,579	7,880	8,192
Taranaki	5,429	5,538	5,650	5,764	5,880	5,998
Manawatu-Wanganui	7,920	8,048	8,177	8,309	8,443	8,578
Wellington	1,765	1,793	1,822	1,851	1,881	1,911
Wairarapa	15,889	17,000	18,187	19,458	20,818	22,272
Tasman-Nelson	9,123	9,236	9,352	9,468	9,587	9,706
Marlborough	2,572	2,800	3,050	3,321	3,617	3,939
West Coast	706	775	850	933	1,025	1,125
Canterbury	40,447	42,091	43,803	45,584	47,438	49,366
Otago	9,268	10,024	10,841	11,725	12,681	13,715
Southland	3,446	3,477	3,508	3,540	3,572	3,604
NZ Total	235,710	253,414	272,779	293,980	317,213	342,698

Wood Waste to landfill, GJ per annum, recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	61,030	65,358	69,992	74,954	80,269	85,960
Auckland	461,629	522,800	592,076	670,532	759,385	860,011
Waikato	607,632	655,881	707,960	764,175	824,854	890,350
Bay of Plenty	51,816	55,985	60,489	65,355	70,613	76,294
Gisborne	13,729	15,202	16,834	18,642	20,643	22,859
Hawkes Bay	60,926	63,340	65,849	68,458	71,170	73,989
Taranaki	49,036	50,023	51,030	52,058	53,106	54,175
Manawatu-Wanganui	71,533	72,685	73,855	75,045	76,253	77,481
Wellington	15,943	16,198	16,457	16,720	16,988	17,259
Wairarapa	143,512	153,540	164,268	175,747	188,027	201,165
Tasman-Nelson	82,395	83,423	84,465	85,519	86,587	87,668
Marlborough	23,226	25,294	27,546	29,998	32,669	35,578
West Coast	6,376	6,998	7,681	8,431	9,254	10,157
Canterbury	365,315	380,169	395,628	411,715	428,456	445,878
Otago	83,713	90,538	97,920	105,903	114,537	123,876
Southland	31,122	31,403	31,686	31,972	32,261	32,552
NZ Total	2,128,933	2,288,837	2,463,737	2,655,224	2,865,070	3,095,251

Wood waste to landfill, tonnes per annum, recovery level 2, 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	5,068	5,427	5,812	6,224	6,665	7,138
Auckland	38,333	43,412	49,165	55,680	63,058	71,414
Waikato	50,457	54,463	58,788	63,456	68,494	73,933
Bay of Plenty	4,303	4,649	5,023	5,427	5,864	6,335
Gisborne	1,140	1,262	1,398	1,548	1,714	1,898
Hawkes Bay	5,059	5,260	5,468	5,685	5,910	6,144
Taranaki	4,072	4,154	4,237	4,323	4,410	4,499
Manawatu-Wanganui	1,977	2,009	2,041	2,074	2,108	2,141
Wellington	1,324	1,345	1,367	1,388	1,411	1,433
Wairarapa	11,917	12,750	13,641	14,594	15,613	16,704
Tasman-Nelson	6,842	6,927	7,014	7,101	7,190	7,280
Marlborough	1,929	2,100	2,287	2,491	2,713	2,954
West Coast	529	581	638	700	768	843
Canterbury	30,335	31,569	32,852	34,188	35,578	37,025
Otago	6,951	7,518	8,131	8,794	9,511	10,286
Southland	2,584	2,608	2,631	2,655	2,679	2,703
NZ Total	172,820	186,034	200,492	216,327	233,686	252,731

Wood Waste to landfill, GJ per annum, recovery level 2, 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	45,773	49,018	52,494	56,216	60,202	64,470
Auckland	346,222	392,100	444,057	502,899	569,538	645,008
Waikato	455,724	491,911	530,970	573,131	618,640	667,763
Bay of Plenty	38,862	41,989	45,367	49,017	52,960	57,221
Gisborne	10,296	11,402	12,626	13,981	15,482	17,144
Hawkes Bay	45,695	47,505	49,387	51,343	53,377	55,492
Taranaki	36,777	37,517	38,273	39,043	39,829	40,631
Manawatu-Wanganui	17,857	18,145	18,437	18,734	19,035	19,342
Wellington	11,957	12,148	12,343	12,540	12,741	12,945
Wairarapa	107,634	115,155	123,201	131,810	141,020	150,874
Tasman-Nelson	61,796	62,568	63,349	64,139	64,940	65,751
Marlborough	17,419	18,970	20,659	22,499	24,502	26,683
West Coast	4,782	5,249	5,761	6,323	6,940	7,618
Canterbury	273,986	285,127	296,721	308,786	321,342	334,408
Otago	62,785	67,904	73,440	79,427	85,903	92,907
Southland	23,342	23,552	23,765	23,979	24,196	24,414
NZ Total	1,560,907	1,680,259	1,810,848	1,953,868	2,110,648	2,282,670

Appendix C – Orchard & Viticulture Residues

Orchard & Viticulture residues, gross tonnage per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	4,957	5,056	5,157	5,260	5,365	5,472
Auckland	7,244	7,389	7,537	7,687	7,841	7,998
Waikato	1,083	1,104	1,126	1,149	1,172	1,195
Bay of Plenty	19,473	19,862	20,259	20,664	21,078	21,499
Gisborne	6,899	7,037	7,178	7,322	7,468	7,617
Hawkes Bay	46,840	47,776	48,732	49,707	50,701	51,715
Taranaki	38	38	39	40	41	41
Manawatu-Wanganui	204	208	212	216	221	225
Wellington	1,300	1,326	1,353	1,380	1,407	1,435
Wairarapa	143	146	149	152	155	158
Tasman-Nelson	17,768	18,123	18,485	18,855	19,232	19,617
Marlborough	38,059	38,820	39,597	40,389	41,197	42,020
West Coast	-	-	-	-	-	-
Canterbury	2,196	2,240	2,285	2,331	2,377	2,425
Otago	14,355	14,642	14,935	15,234	15,538	15,849
Southland	-	-	-	-	-	-
NZ Total	160,663	163,876	167,153	170,496	173,906	177,385

Orchard & Viticulture residues, gross energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	36,480	37,210	37,954	38,713	39,487	40,277
Auckland	53,316	54,382	55,470	56,579	57,711	58,865
Waikato	7,968	8,127	8,290	8,456	8,625	8,797
Bay of Plenty	143,318	146,184	149,108	152,090	155,132	158,234
Gisborne	50,778	51,794	52,830	53,886	54,964	56,063
Hawkes Bay	344,739	351,634	358,667	365,840	373,157	380,620
Taranaki	276	282	287	293	299	305
Manawatu-Wanganui	1,500	1,530	1,561	1,592	1,624	1,656
Wellington	9,568	9,759	9,955	10,154	10,357	10,564
Wairarapa	1,052	1,074	1,095	1,117	1,139	1,162
Tasman-Nelson	130,769	133,384	136,052	138,773	141,548	144,379
Marlborough	280,116	285,718	291,433	297,261	303,207	309,271
West Coast	-	-	-	-	-	-
Canterbury	16,164	16,487	16,817	17,153	17,496	17,846
Otago	105,653	107,766	109,921	112,120	114,362	116,649
Southland	-	-	-	-	-	-
NZ Total	1,182,477	1,206,126	1,230,249	1,254,854	1,279,951	1,305,550

Orchard & Viticulture residues, green tonnes per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	3,965	4,045	4,125	4,208	4,292	4,378
Auckland	5,795	5,911	6,029	6,150	6,273	6,398
Waikato	866	883	901	919	937	956
Bay of Plenty	15,578	15,890	16,207	16,531	16,862	17,199
Gisborne	5,519	5,630	5,742	5,857	5,974	6,094
Hawkes Bay	37,472	38,221	38,986	39,765	40,561	41,372
Taranaki	30	31	31	32	32	33
Manawatu-Wanganui	163	166	170	173	176	180
Wellington	1,040	1,061	1,082	1,104	1,126	1,148
Wairarapa	114	117	119	121	124	126
Tasman-Nelson	14,214	14,498	14,788	15,084	15,386	15,693
Marlborough	30,447	31,056	31,677	32,311	32,957	33,616
West Coast	-	-	-	-	-	-
Canterbury	1,757	1,792	1,828	1,864	1,902	1,940
Otago	11,484	11,714	11,948	12,187	12,431	12,679
Southland	-	-	-	-	-	-
NZ Total	128,530	131,101	133,723	136,397	139,125	141,908

Orchard & Viticulture residues, energy (GJ) per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	29,184	29,768	30,363	30,970	31,590	32,221
Auckland	42,653	43,506	44,376	45,263	46,169	47,092
Waikato	6,374	6,502	6,632	6,765	6,900	7,038
Bay of Plenty	114,654	116,947	119,286	121,672	124,105	126,587
Gisborne	40,623	41,435	42,264	43,109	43,971	44,851
Hawkes Bay	275,791	281,307	286,933	292,672	298,525	304,496
Taranaki	221	225	230	234	239	244
Manawatu-Wanganui	1,200	1,224	1,248	1,273	1,299	1,325
Wellington	7,654	7,807	7,964	8,123	8,285	8,451
Wairarapa	842	859	876	894	911	930
Tasman-Nelson	104,615	106,707	108,841	111,018	113,239	115,503
Marlborough	224,093	228,575	233,146	237,809	242,565	247,417
West Coast	-	-	-	-	-	-
Canterbury	12,931	13,190	13,454	13,723	13,997	14,277
Otago	84,522	86,213	87,937	89,696	91,490	93,319
Southland	-	-	-	-	-	-
NZ Total	945,981	964,901	984,199	1,003,883	1,023,961	1,044,440

Orchard & Viticulture residues, green tonnes per annum, recoverability level 2, 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	3,222	3,286	3,352	3,419	3,487	3,557
Auckland	4,709	4,803	4,899	4,997	5,097	5,199
Waikato	704	718	732	747	762	777
Bay of Plenty	12,657	12,910	13,168	13,432	13,700	13,974
Gisborne	4,485	4,574	4,666	4,759	4,854	4,951
Hawkes Bay	30,446	31,055	31,676	32,309	32,955	33,615
Taranaki	24	25	25	26	26	27
Manawatu-Wanganui	132	135	138	141	143	146
Wellington	845	862	879	897	915	933
Wairarapa	93	95	97	99	101	103
Tasman-Nelson	11,549	11,780	12,015	12,256	12,501	12,751
Marlborough	24,739	25,233	25,738	26,253	26,778	27,313
West Coast	-	-	-	-	-	-
Canterbury	1,428	1,456	1,485	1,515	1,545	1,576
Otago	9,331	9,517	9,708	9,902	10,100	10,302
Southland	-	-	-	-	-	-
NZ Total	104,431	106,519	108,650	110,823	113,039	115,300

Orchard & Viticulture residues, energy (GJ) per annum, recoverability level 2, 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	23,712	24,186	24,670	25,163	25,667	26,180
Auckland	34,655	35,349	36,055	36,777	37,512	38,262
Waikato	5,179	5,283	5,388	5,496	5,606	5,718
Bay of Plenty	93,156	95,020	96,920	98,858	100,836	102,852
Gisborne	33,006	33,666	34,339	35,026	35,727	36,441
Hawkes Bay	224,080	228,562	233,133	237,796	242,552	247,403
Taranaki	179	183	187	190	194	198
Manawatu-Wanganui	975	995	1,014	1,035	1,055	1,076
Wellington	6,219	6,344	6,470	6,600	6,732	6,866
Wairarapa	684	698	712	726	741	755
Tasman-Nelson	85,000	86,700	88,434	90,202	92,006	93,847
Marlborough	182,075	185,717	189,431	193,220	197,084	201,026
West Coast	-	-	-	-	-	-
Canterbury	10,507	10,717	10,931	11,150	11,373	11,600
Otago	68,674	70,048	71,449	72,878	74,335	75,822
Southland	-	-	-	-	-	-
NZ Total	768,610	783,982	799,662	815,655	831,968	848,607

Appendix D – Straw and Stover residues

Straw and Stover residues, sustainable tonnage, per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,465	1,495	1,524	1,555	1,586	1,618
Auckland	3,226	3,290	3,356	3,423	3,492	3,562
Waikato	14,692	14,986	15,286	15,591	15,903	16,221
Bay of Plenty	8,346	8,513	8,683	8,857	9,034	9,215
Gisborne	7,070	7,212	7,356	7,503	7,653	7,806
Hawkes Bay	7,254	7,399	7,547	7,698	7,852	8,009
Taranaki	352	359	366	373	381	388
Manawatu-Wanganui	15,062	15,364	15,671	15,984	16,304	16,630
Wellington	1,341	1,367	1,395	1,423	1,451	1,480
Wairarapa	2,011	2,052	2,093	2,134	2,177	2,221
Tasman-Nelson	-	-	-0	-0	-0	-0
Marlborough	1,596	1,628	1,660	1,694	1,727	1,762
West Coast	-	-	-0	-0	-0	-0
Canterbury	207,051	211,193	215,416	219,725	224,119	228,602
Otago	20,539	20,950	21,369	21,797	22,233	22,677
Southland	13,198	13,462	13,731	14,005	14,285	14,571
NZ Total	303,204	309,268	315,454	321,763	328,198	334,762

Straw and Stover residues, sustainable energy, (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	26,081	26,602	27,134	27,677	28,230	28,795
Auckland	57,422	58,571	59,742	60,937	62,155	63,398
Waikato	261,517	266,747	272,082	277,524	283,074	288,736
Bay of Plenty	148,563	151,534	154,565	157,656	160,809	164,025
Gisborne	125,853	128,370	130,938	133,556	136,227	138,952
Hawkes Bay	129,121	131,704	134,338	137,024	139,765	142,560
Taranaki	6,261	6,386	6,513	6,644	6,776	6,912
Manawatu-Wanganui	268,111	273,473	278,942	284,521	290,211	296,016
Wellington	23,863	24,341	24,827	25,324	25,830	26,347
Wairarapa	35,801	36,518	37,248	37,993	38,752	39,527
Tasman-Nelson	-	-	-0	-0	-0	-0
Marlborough	28,407	28,975	29,554	30,145	30,748	31,363
West Coast	-	-	-0	-0	-0	-0
Canterbury	3,685,516	3,759,227	3,834,411	3,911,099	3,989,321	4,069,108
Otago	365,602	372,914	380,372	387,980	395,739	403,654
Southland	234,917	239,616	244,408	249,296	254,282	259,367
NZ Total	5,397,035	5,504,976	5,615,075	5,727,375	5,841,922	5,958,759

Straw and Stover residues, tonnage per annum recoverability level 1, 80%

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2053
Northland	1,425	1,453	1,482	1,512	1,542	1,573
Auckland	3,136	3,199	3,263	3,328	3,395	3,463
Waikato	14,284	14,570	14,861	15,158	15,461	15,771
Bay of Plenty	8,114	8,277	8,442	8,611	8,783	8,959
Gisborne	6,874	7,011	7,152	7,295	7,441	7,589
Hawkes Bay	7,053	7,194	7,337	7,484	7,634	7,787
Taranaki	342	349	356	363	370	378
Manawatu-Wanganui	14,644	14,937	15,236	15,540	15,851	16,168
Wellington	1,303	1,329	1,356	1,383	1,411	1,439
Wairarapa	1,955	1,995	2,034	2,075	2,117	2,159
Tasman-Nelson	-	-	-	-	-	-
Marlborough	1,552	1,583	1,614	1,647	1,679	1,713
West Coast	-	-	-	-	-	-
Canterbury	201,300	205,326	209,433	213,621	217,894	222,252
Otago	19,969	20,368	20,776	21,191	21,615	22,047
Southland	12,831	13,088	13,349	13,616	13,889	14,166
NZ Total	294,782	300,678	306,691	312,825	319,081	325,463

Straw and Stover residues, energy (GJ) per annum. recoverability level 1, 80%

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2053
Northland	25,356	25,863	26,380	26,908	27,446	27,995
Auckland	55,827	56,944	58,082	59,244	60,429	61,638
Waikato	254,253	259,338	264,524	269,815	275,211	280,715
Bay of Plenty	144,436	147,325	150,272	153,277	156,343	159,469
Gisborne	122,357	124,804	127,300	129,846	132,443	135,092
Hawkes Bay	125,535	128,045	130,606	133,218	135,883	138,600
Taranaki	6,087	6,208	6,333	6,459	6,588	6,720
Manawatu-Wanganui	260,663	265,876	271,194	276,618	282,150	287,793
Wellington						
Wairarapa	34,807	35,503	36,213	36,937	37,676	38,430
Tasman-Nelson	-	-	-	-	-	-
Marlborough	27,618	28,170	28,733	29,308	29,894	30,492
West Coast	-	-	-	-	-	-
Canterbury	3,583,141	3,654,804	3,727,900	3,802,458	3,878,507	3,956,077
Otago	355,446	362,555	369,806	377,203	384,747	392,442
Southland	228,392	232,960	237,619	242,371	247,219	252,163
NZ Total	5,247,118	5,352,060	5,459,101	5,568,283	5,679,649	5,793,242

Straw and Stover residues, tonnage per annum recoverability level 2, 60%

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2053
Northland	1,221	1,245	1,270	1,296	1,322	1,348
Auckland	2,688	2,742	2,797	2,853	2,910	2,968
Waikato	12,243	12,488	12,738	12,993	13,253	13,518
Bay of Plenty	6,955	7,094	7,236	7,381	7,529	7,679
Gisborne	5,892	6,010	6,130	6,253	6,378	6,505
Hawkes Bay	6,045	6,166	6,289	6,415	6,543	6,674
Taranaki	293	299	305	311	317	324
Manawatu-Wanganui	12,552	12,803	13,059	13,320	13,587	13,858
Wellington	1,117	1,140	1,162	1,186	1,209	1,233
Wairarapa	1,676	1,710	1,744	1,779	1,814	1,851
Tasman-Nelson	-	-	-	-	-	-
Marlborough	1,330	1,356	1,384	1,411	1,440	1,468
West Coast	-	-	-	-	-	-
Canterbury	172,543	175,994	179,514	183,104	186,766	190,501
Otago	17,116	17,459	17,808	18,164	18,527	18,898
Southland	10,998	11,218	11,442	11,671	11,905	12,143
NZ Total	252,670	257,724	262,878	268,136	273,498	278,968

Straw and Stover residues, energy (GJ) per annum. recoverability level 2, 60%

	2024-2028	2029-2033	2034-2038	2039-2043	2044-2048	2049-2053
Northland	21,734	22,168	22,612	23,064	23,525	23,996
Auckland	47,852	48,809	49,785	50,781	51,796	52,832
Waikato	217,931	222,289	226,735	231,270	235,895	240,613
Bay of Plenty	123,803	126,279	128,804	131,380	134,008	136,688
Gisborne	104,878	106,975	109,115	111,297	113,523	115,793
Hawkes Bay	107,601	109,753	111,948	114,187	116,471	118,800
Taranaki	5,217	5,322	5,428	5,537	5,647	5,760
Manawatu-Wanganui	223,426	227,894	232,452	237,101	241,843	246,680
Wellington						
Wairarapa	29,835	30,431	31,040	31,661	32,294	32,940
Tasman-Nelson	-	-	-	-	-	-
Marlborough	23,672	24,146	24,629	25,121	25,624	26,136
West Coast	-	-	-	-	-	-
Canterbury	3,071,264	3,132,689	3,195,343	3,259,250	3,324,435	3,390,923
Otago	304,668	310,762	316,977	323,317	329,783	336,378
Southland	195,764	199,680	203,673	207,747	211,902	216,140
NZ Total	4,497,530	4,587,480	4,679,230	4,772,814	4,868,271	4,965,636

Appendix E – Wood processing residues

Gross wood processing residues (after incumbent use) green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	8,551	8,551	8,551	8,551	8,551	8,551
Auckland	-109,053	-109,053	-109,053	-109,053	-109,053	-109,053
Waikato	56,872	56,872	56,872	56,872	56,872	56,872
Bay of Plenty	70,983	70,983	70,983	70,983	70,983	70,983
Gisborne	-6,636	-6,636	-6,636	-6,636	-6,636	-6,636
Hawkes Bay	-133,000	-133,000	-133,000	-133,000	-133,000	-133,000
Taranaki	4,474	4,474	4,474	4,474	4,474	4,474
Manawatu-Wanganui	17,375	17,375	17,375	17,375	17,375	17,375
Wellington	0	0	0	0	0	0
Wairarapa	-9,679	-9,679	-9,679	-9,679	-9,679	-9,679
Tasman-Nelson	32,250	32,250	32,250	32,250	32,250	32,250
Marlborough	-71	-71	-71	-71	-71	-71
West Coast	15,138	15,138	15,138	15,138	15,138	15,138
Canterbury	-1,752	-1,752	-1,752	-1,752	-1,752	-1,752
Otago	-1,914	-1,914	-1,914	-1,914	-1,914	-1,914
Southland	-41,255	-41,255	-41,255	-41,255	-41,255	-41,255
NZ Total	-97,717	-97,717	-97,717	-97,717	-97,717	-97,717

The gross wood energy use for heat within the wood processing industry is 23,868,000 GJ (23.868 PJ) per annum. The apparent deficit after incumbent use is 8% and given margin of error in calculations it can basically be assumed to be in balance with some site exceptions. The wood processing industry is largely in balance and provides much of its own heat energy demand from internally generated residues.

Gross wood processing residues (after incumbent use) energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	59,002	59,002	59,002	59,002	59,002	59,002
Auckland	-752,466	-752,466	-752,466	-752,466	-752,466	-752,466
Waikato	392,417	392,417	392,417	392,417	392,417	392,417
Bay of Plenty	489,783	489,783	489,783	489,783	489,783	489,783
Gisborne	-45,788	-45,788	-45,788	-45,788	-45,788	-45,788
Hawkes Bay	-917,700	-917,700	-917,700	-917,700	-917,700	-917,700
Taranaki	30,871	30,871	30,871	30,871	30,871	30,871
Manawatu-Wanganui	119,888	119,888	119,888	119,888	119,888	119,888
Wellington	0	0	0	0	0	0
Wairarapa	-66,785	-66,785	-66,785	-66,785	-66,785	-66,785
Tasman-Nelson	222,525	222,525	222,525	222,525	222,525	222,525
Marlborough	-490	-490	-490	-490	-490	-490
West Coast	104,452	104,452	104,452	104,452	104,452	104,452
Canterbury	-12,089	-12,089	-12,089	-12,089	-12,089	-12,089
Otago	-13,207	-13,207	-13,207	-13,207	-13,207	-13,207
Southland	-284,660	-284,660	-284,660	-284,660	-284,660	-284,660
NZ Total	-674,247	-674,247	-674,247	-674,247	-674,247	-674,247

Wood processing residues, green tonnes per annum, recovery level 1, 95%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	8,123	8,123	8,123	8,123	8,123	8,123
Auckland	-103,600	-103,600	-103,600	-103,600	-103,600	-103,600
Waikato	54,028	54,028	54,028	54,028	54,028	54,028
Bay of Plenty	67,434	67,434	67,434	67,434	67,434	67,434
Gisborne	-6,304	-6,304	-6,304	-6,304	-6,304	-6,304
Hawkes Bay	-126,350	-126,350	-126,350	-126,350	-126,350	-126,350
Taranaki	4,250	4,250	4,250	4,250	4,250	4,250
Manawatu-Wanganui	16,506	16,506	16,506	16,506	16,506	16,506
Wellington	0	0	0	0	0	0
Wairarapa	-9,195	-9,195	-9,195	-9,195	-9,195	-9,195
Tasman-Nelson	30,638	30,638	30,638	30,638	30,638	30,638
Marlborough	-67	-67	-67	-67	-67	-67
West Coast	14,381	14,381	14,381	14,381	14,381	14,381
Canterbury	-1,664	-1,664	-1,664	-1,664	-1,664	-1,664
Otago	-1,818	-1,818	-1,818	-1,818	-1,818	-1,818
Southland	-39,192	-39,192	-39,192	-39,192	-39,192	-39,192
NZ Total	-92,831	-92,831	-92,831	-92,831	-92,831	-92,831

Wood processing residues, energy (GJ) per annum, recovery level 1, 95%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	56,052	56,052	56,052	56,052	56,052	56,052
Auckland	-714,842	-714,842	-714,842	-714,842	-714,842	-714,842
Waikato	372,796	372,796	372,796	372,796	372,796	372,796
Bay of Plenty	465,294	465,294	465,294	465,294	465,294	465,294
Gisborne	-43,499	-43,499	-43,499	-43,499	-43,499	-43,499
Hawkes Bay	-871,815	-871,815	-871,815	-871,815	-871,815	-871,815
Taranaki	29,327	29,327	29,327	29,327	29,327	29,327
Manawatu-Wanganui	113,893	113,893	113,893	113,893	113,893	113,893
Wellington	0	0	0	0	0	0
Wairarapa	-63,446	-63,446	-63,446	-63,446	-63,446	-63,446
Tasman-Nelson	211,399	211,399	211,399	211,399	211,399	211,399
Marlborough	-465	-465	-465	-465	-465	-465
West Coast	99,230	99,230	99,230	99,230	99,230	99,230
Canterbury	-11,484	-11,484	-11,484	-11,484	-11,484	-11,484
Otago	-12,546	-12,546	-12,546	-12,546	-12,546	-12,546
Southland	-270,427	-270,427	-270,427	-270,427	-270,427	-270,427
NZ Total	-640,535	-640,535	-640,535	-640,535	-640,535	-640,535

Wood processing residues, green tonnes per annum, recovery level 2, 90%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	7,696	7,696	7,696	7,696	7,696	7,696
Auckland	-98,148	-98,148	-98,148	-98,148	-98,148	-98,148
Waikato	51,185	51,185	51,185	51,185	51,185	51,185
Bay of Plenty	63,885	63,885	63,885	63,885	63,885	63,885
Gisborne	-5,972	-5,972	-5,972	-5,972	-5,972	-5,972
Hawkes Bay	-119,700	-119,700	-119,700	-119,700	-119,700	-119,700
Taranaki	4,027	4,027	4,027	4,027	4,027	4,027
Manawatu-Wanganui	15,638	15,638	15,638	15,638	15,638	15,638
Wellington	0	0	0	0	0	0
Wairarapa	-8,711	-8,711	-8,711	-8,711	-8,711	-8,711
Tasman-Nelson	29,025	29,025	29,025	29,025	29,025	29,025
Marlborough	-64	-64	-64	-64	-64	-64
West Coast	13,624	13,624	13,624	13,624	13,624	13,624
Canterbury	-1,577	-1,577	-1,577	-1,577	-1,577	-1,577
Otago	-1,723	-1,723	-1,723	-1,723	-1,723	-1,723
Southland	-37,130	-37,130	-37,130	-37,130	-37,130	-37,130
NZ Total	-87,945	-87,945	-87,945	-87,945	-87,945	-87,945

Wood processing residues, energy (GJ) per annum, recovery level 2, 90%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	53,102	53,102	53,102	53,102	53,102	53,102
Auckland	-677,219	-677,219	-677,219	-677,219	-677,219	-677,219
Waikato	353,175	353,175	353,175	353,175	353,175	353,175
Bay of Plenty	440,804	440,804	440,804	440,804	440,804	440,804
Gisborne	-41,210	-41,210	-41,210	-41,210	-41,210	-41,210
Hawkes Bay	-825,930	-825,930	-825,930	-825,930	-825,930	-825,930
Taranaki	27,784	27,784	27,784	27,784	27,784	27,784
Manawatu-Wanganui	107,899	107,899	107,899	107,899	107,899	107,899
Wellington	0	0	0	0	0	0
Wairarapa	-60,107	-60,107	-60,107	-60,107	-60,107	-60,107
Tasman-Nelson	200,273	200,273	200,273	200,273	200,273	200,273
Marlborough	-441	-441	-441	-441	-441	-441
West Coast	94,007	94,007	94,007	94,007	94,007	94,007
Canterbury	-10,880	-10,880	-10,880	-10,880	-10,880	-10,880
Otago	-11,886	-11,886	-11,886	-11,886	-11,886	-11,886
Southland	-256,194	-256,194	-256,194	-256,194	-256,194	-256,194
NZ Total	-606,823	-606,823	-606,823	-606,823	-606,823	-606,823

Appendix F - Port bark

Gross bark supply at ports (no debarking) tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	65,325	58,793	55,526	65,325	65,325	65,325
Auckland	1,516	1,364	1,289	1,516	1,516	1,516
Tauranga	150,000	135,000	127,500	150,000	150,000	150,000
Gisborne	74,257	66,831	63,118	74,257	74,257	74,257
Napier	44,906	40,415	38,170	44,906	44,906	44,906
New Plymouth	12,245	11,021	10,408	12,245	12,245	12,245
Wellington	3,189	2,870	2,711	3,189	3,189	3,189
Nelson	39,068	35,161	33,208	39,068	39,068	39,068
Picton	38,559	34,703	32,775	38,559	38,559	38,559
Christchurch	35,195	31,676	29,916	35,195	35,195	35,195
Timaru	65,423	58,881	55,610	65,423	65,423	65,423
Dunedin	44,808	40,327	38,087	44,808	44,808	44,808
Invercargill	29,427	26,484	25,013	29,427	29,427	29,427
Total	250,899	225,809	213,264	250,899	250,899	250,899

Gross bark supply at ports (no debarking) energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	450,743	405,668	383,131	450,743	450,743	450,743
Auckland	10,460	9,414	8,891	10,460	10,460	10,460
Tauranga	1,035,000	931,500	879,750	1,035,000	1,035,000	1,035,000
Gisborne	512,373	461,136	435,517	512,373	512,373	512,373
Napier	309,851	278,866	263,374	309,851	309,851	309,851
New Plymouth	84,491	76,041	71,817	84,491	84,491	84,491
Wellington	22,004	19,804	18,703	22,004	22,004	22,004
Nelson	269,569	242,612	229,134	269,569	269,569	269,569
Picton	266,057	239,451	226,149	266,057	266,057	266,057
Christchurch	242,846	218,561	206,419	242,846	242,846	242,846
Timaru	451,419	406,277	383,706	451,419	451,419	451,419
Dunedin	309,175	278,258	262,799	309,175	309,175	309,175
Invercargill	203,046	182,742	172,589	203,046	203,046	203,046
Total	1,731,205	1,558,085	1,471,525	1,731,205	1,731,205	1,731,205

Bark supply at ports, tonnes per annum, recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	52,260	47,034	44,421	52,260	52,260	52,260
Auckland	1,213	1,092	1,031	1,213	1,213	1,213
Tauranga	120,000	108,000	102,000	120,000	120,000	120,000
Gisborne	59,406	53,465	50,495	59,406	59,406	59,406
Napier	35,925	32,332	30,536	35,925	35,925	35,925
New Plymouth	9,796	8,816	8,327	9,796	9,796	9,796
Wellington	2,551	2,296	2,169	2,551	2,551	2,551
Nelson	31,254	28,129	26,566	31,254	31,254	31,254
Picton	30,847	27,762	26,220	30,847	30,847	30,847
Christchurch	28,156	25,340	23,933	28,156	28,156	28,156
Timaru	52,338	47,105	44,488	52,338	52,338	52,338
Dunedin	35,846	32,262	30,469	35,846	35,846	35,846
Invercargill	23,542	21,187	20,010	23,542	23,542	23,542
Total	200,719	180,648	170,612	200,719	200,719	200,719

Bark supply at ports, energy (GJ) per annum, recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	355,368	319,831	302,063	355,368	355,368	355,368
Auckland	8,247	7,422	7,010	8,247	8,247	8,247
Tauranga	816,000	734,400	693,600	816,000	816,000	816,000
Gisborne	403,958	363,562	343,364	403,958	403,958	403,958
Napier	244,289	219,860	207,645	244,289	244,289	244,289
New Plymouth	66,613	59,952	56,621	66,613	66,613	66,613
Wellington	17,348	15,613	14,746	17,348	17,348	17,348
Nelson	212,530	191,277	180,650	212,530	212,530	212,530
Picton	209,761	188,785	178,297	209,761	209,761	209,761
Christchurch	191,461	172,315	162,742	191,461	191,461	191,461
Timaru	355,901	320,311	302,516	355,901	355,901	355,901
Dunedin	243,756	219,380	207,192	243,756	243,756	243,756
Invercargill	160,083	144,075	136,070	160,083	160,083	160,083
Total	1,364,892	1,228,403	1,160,158	1,364,892	1,364,892	1,364,892

Bark supply at ports, tonnes per annum, recovery level 2, 70%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	45,728	41,155	38,868	45,728	45,728	45,728
Auckland	1,061	955	902	1,061	1,061	1,061
Tauranga	105,000	94,500	89,250	105,000	105,000	105,000
Gisborne	51,980	46,782	44,183	51,980	51,980	51,980
Napier	31,434	28,291	26,719	31,434	31,434	31,434
New Plymouth	8,572	7,714	7,286	8,572	8,572	8,572
Wellington	2,232	2,009	1,897	2,232	2,232	2,232
Nelson	27,348	24,613	23,245	27,348	27,348	27,348
Picton	26,991	24,292	22,943	26,991	26,991	26,991
Christchurch	24,637	22,173	20,941	24,637	24,637	24,637
Timaru	45,796	41,216	38,927	45,796	45,796	45,796
Dunedin	31,366	28,229	26,661	31,366	31,366	31,366
Invercargill	20,599	18,539	17,509	20,599	20,599	20,599
Total	175,630	158,067	149,285	175,630	175,630	175,630

Bark supply at ports, energy (GJ) per annum, recovery level 2, 70%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Whangarei	310,947	279,852	264,305	310,947	310,947	310,947
Auckland	7,216	6,495	6,134	7,216	7,216	7,216
Tauranga	714,000	642,600	606,900	714,000	714,000	714,000
Gisborne	353,463	318,117	300,444	353,463	353,463	353,463
Napier	213,753	192,377	181,690	213,753	213,753	213,753
New Plymouth	58,286	52,458	49,543	58,286	58,286	58,286
Wellington	15,180	13,662	12,903	15,180	15,180	15,180
Nelson	185,964	167,367	158,069	185,964	185,964	185,964
Picton	183,541	165,187	156,010	183,541	183,541	183,541
Christchurch	167,528	150,775	142,399	167,528	167,528	167,528
Timaru	311,413	280,272	264,701	311,413	311,413	311,413
Dunedin	213,286	191,957	181,293	213,286	213,286	213,286
Invercargill	140,073	126,065	119,062	140,073	140,073	140,073
Total	1,194,281	1,074,853	1,015,139	1,194,281	1,194,281	1,194,281

Appendix G – Shelterbelt turnover residuals

Shelter belt turnover residuals, Gross Volume; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,495	1,495	1,495	1,495	1,495	1,495
Auckland	2,705	2,705	2,705	2,705	2,705	2,705
Waikato	6,407	6,407	6,407	6,407	6,407	6,407
Bay of Plenty	5,695	5,695	5,695	5,695	5,695	5,695
Gisborne	285	285	285	285	285	285
Hawkes Bay	3,702	3,702	3,702	3,702	3,702	3,702
Taranaki	1,353	1,353	1,353	1,353	1,353	1,353
Manawatu-Wanganui	4,699	4,699	4,699	4,699	4,699	4,699
Wellington	142	142	142	142	142	142
Wairarapa	2,848	2,848	2,848	2,848	2,848	2,848
Tasman-Nelson	498	498	498	498	498	498
Marlborough	1,709	1,709	1,709	1,709	1,709	1,709
West Coast	356	356	356	356	356	356
Canterbury	26,412	26,412	26,412	26,412	26,412	26,412
Otago	6,407	6,407	6,407	6,407	6,407	6,407
Southland	8,187	8,187	8,187	8,187	8,187	8,187
NZ Total	72,900	72,900	72,900	72,900	72,900	72,900

Shelter belt turnover residuals, Gross energy (GJ per annum)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	10,316	10,316	10,316	10,316	10,316	10,316
Auckland	18,666	18,666	18,666	18,666	18,666	18,666
Waikato	44,210	44,210	44,210	44,210	44,210	44,210
Bay of Plenty	39,298	39,298	39,298	39,298	39,298	39,298
Gisborne	1,965	1,965	1,965	1,965	1,965	1,965
Hawkes Bay	25,543	25,543	25,543	25,543	25,543	25,543
Taranaki	9,333	9,333	9,333	9,333	9,333	9,333
Manawatu-Wanganui	32,421	32,421	32,421	32,421	32,421	32,421
Wellington	982	982	982	982	982	982
Wairarapa	19,649	19,649	19,649	19,649	19,649	19,649
Tasman-Nelson	3,439	3,439	3,439	3,439	3,439	3,439
Marlborough	11,789	11,789	11,789	11,789	11,789	11,789
West Coast	2,456	2,456	2,456	2,456	2,456	2,456
Canterbury	182,243	182,243	182,243	182,243	182,243	182,243
Otago	44,210	44,210	44,210	44,210	44,210	44,210
Southland	56,490	56,490	56,490	56,490	56,490	56,490
NZ Total	503,010	503,010	503,010	503,010	503,010	503,010

Shelter belt turnover residuals, Volume (m³ p.a.) Recoverability Level 1 = 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,196	1,196	1,196	1,196	1,196	1,196
Auckland	2,164	2,164	2,164	2,164	2,164	2,164
Waikato	5,126	5,126	5,126	5,126	5,126	5,126
Bay of Plenty	4,556	4,556	4,556	4,556	4,556	4,556
Gisborne	228	228	228	228	228	228
Hawkes Bay	2,962	2,962	2,962	2,962	2,962	2,962
Taranaki	1,082	1,082	1,082	1,082	1,082	1,082
Manawatu-Wanganui	3,759	3,759	3,759	3,759	3,759	3,759
Wellington	114	114	114	114	114	114
Wairarapa	2,278	2,278	2,278	2,278	2,278	2,278
Tasman-Nelson	399	399	399	399	399	399
Marlborough	1,367	1,367	1,367	1,367	1,367	1,367
West Coast	285	285	285	285	285	285
Canterbury	21,130	21,130	21,130	21,130	21,130	21,130
Otago	5,126	5,126	5,126	5,126	5,126	5,126
Southland	6,550	6,550	6,550	6,550	6,550	6,550
NZ Total	58,320	58,320	58,320	58,320	58,320	58,320

Shelter belt turnover residuals, Energy (GJ p.a.) Recoverability Level 1 = 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	8,253	8,253	8,253	8,253	8,253	8,253
Auckland	14,933	14,933	14,933	14,933	14,933	14,933
Waikato	35,368	35,368	35,368	35,368	35,368	35,368
Bay of Plenty	31,438	31,438	31,438	31,438	31,438	31,438
Gisborne	1,572	1,572	1,572	1,572	1,572	1,572
Hawkes Bay	20,435	20,435	20,435	20,435	20,435	20,435
Taranaki	7,467	7,467	7,467	7,467	7,467	7,467
Manawatu-Wanganui	25,936	25,936	25,936	25,936	25,936	25,936
Wellington	786	786	786	786	786	786
Wairarapa	15,719	15,719	15,719	15,719	15,719	15,719
Tasman-Nelson	2,751	2,751	2,751	2,751	2,751	2,751
Marlborough	9,431	9,431	9,431	9,431	9,431	9,431
West Coast	1,965	1,965	1,965	1,965	1,965	1,965
Canterbury	145,794	145,794	145,794	145,794	145,794	145,794
Otago	35,368	35,368	35,368	35,368	35,368	35,368
Southland	45,192	45,192	45,192	45,192	45,192	45,192
NZ Total	402,408	402,408	402,408	402,408	402,408	402,408

Shelter belt turnover residuals, Volume (m³ p.a.) Recoverability Level 2 = 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	897	897	897	897	897	897
Auckland	1,623	1,623	1,623	1,623	1,623	1,623
Waikato	3,844	3,844	3,844	3,844	3,844	3,844
Bay of Plenty	3,417	3,417	3,417	3,417	3,417	3,417
Gisborne	171	171	171	171	171	171
Hawkes Bay	2,221	2,221	2,221	2,221	2,221	2,221
Taranaki	812	812	812	812	812	812
Manawatu-Wanganui	2,819	2,819	2,819	2,819	2,819	2,819
Wellington	85	85	85	85	85	85
Wairarapa	1,709	1,709	1,709	1,709	1,709	1,709
Tasman-Nelson	299	299	299	299	299	299
Marlborough	1,025	1,025	1,025	1,025	1,025	1,025
West Coast	214	214	214	214	214	214
Canterbury	15,847	15,847	15,847	15,847	15,847	15,847
Otago	3,844	3,844	3,844	3,844	3,844	3,844
Southland	4,912	4,912	4,912	4,912	4,912	4,912
NZ Total	43,740	43,740	43,740	43,740	43,740	43,740

Shelter belt turnover residuals, Energy (GJ p.a.) Recoverability Level 2 = 60%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	6,189	6,189	6,189	6,189	6,189	6,189
Auckland	11,200	11,200	11,200	11,200	11,200	11,200
Waikato	26,526	26,526	26,526	26,526	26,526	26,526
Bay of Plenty	23,579	23,579	23,579	23,579	23,579	23,579
Gisborne	1,179	1,179	1,179	1,179	1,179	1,179
Hawkes Bay	15,326	15,326	15,326	15,326	15,326	15,326
Taranaki	5,600	5,600	5,600	5,600	5,600	5,600
Manawatu-Wanganui	19,452	19,452	19,452	19,452	19,452	19,452
Wellington	589	589	589	589	589	589
Wairarapa	11,789	11,789	11,789	11,789	11,789	11,789
Tasman-Nelson	2,063	2,063	2,063	2,063	2,063	2,063
Marlborough	7,074	7,074	7,074	7,074	7,074	7,074
West Coast	1,474	1,474	1,474	1,474	1,474	1,474
Canterbury	109,346	109,346	109,346	109,346	109,346	109,346
Otago	26,526	26,526	26,526	26,526	26,526	26,526
Southland	33,894	33,894	33,894	33,894	33,894	33,894
NZ Total	301,806	301,806	301,806	301,806	301,806	301,806

Appendix H – Pulp logs

Gross pulp log supply; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	408,283	220,361	312,460	460,727	455,007	323,751
Auckland	153,395	93,343	53,483	29,653	45,629	99,020
Waikato	761,173	413,191	323,231	371,148	416,942	492,665
Bay of Plenty	957,212	933,027	986,665	1,076,006	939,996	919,108
Gisborne	464,217	201,140	194,679	257,807	253,929	272,057
Hawkes Bay	280,664	233,657	193,541	245,366	373,578	370,283
Taranaki	76,530	18,737	10,925	11,174	32,344	39,290
Manawatu-Wanganui	226,493	67,253	44,883	45,468	49,842	71,988
Wellington	185,472	61,444	52,358	77,501	103,803	105,012
Wairarapa	31,865	7,567	2,226	1,446	2,763	8,032
Tasman-Nelson	244,172	197,252	177,478	173,001	168,540	212,230
Marlborough	240,994	107,483	127,214	166,925	142,467	110,548
West Coast	26,111	22,812	26,560	26,031	25,875	21,364
Canterbury	219,971	116,521	121,753	110,790	85,839	103,034
Otago	280,047	223,066	242,170	203,651	221,535	228,671
Southland	183,920	184,074	210,679	140,811	114,490	127,222
NZ Total	4,740,518	3,100,929	3,080,305	3,397,504	3,432,579	3,504,276

Gross pulp log energy supply; GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,817,156	1,520,493	2,155,976	3,179,016	3,139,547	2,233,881
Auckland	1,058,425	644,069	369,032	204,607	314,843	683,238
Waikato	5,252,092	2,851,018	2,230,293	2,560,924	2,876,903	3,399,386
Bay of Plenty	6,604,761	6,437,888	6,807,987	7,424,443	6,485,971	6,341,845
Gisborne	3,203,095	1,387,869	1,343,283	1,778,865	1,752,112	1,877,195
Hawkes Bay	1,936,579	1,612,234	1,335,435	1,693,027	2,577,690	2,554,953
Taranaki	528,060	129,284	75,383	77,100	223,177	271,102
Manawatu-Wanganui	1,562,800	464,044	309,695	313,728	343,909	496,717
Wellington	1,279,760	423,965	361,270	534,756	716,238	724,585
Wairarapa	219,870	52,209	15,361	9,976	19,062	55,424
Tasman-Nelson	1,684,789	1,361,040	1,224,601	1,193,706	1,162,923	1,464,389
Marlborough	1,662,856	741,630	877,774	1,151,783	983,023	762,779
West Coast	180,165	157,401	183,263	179,614	178,538	147,413
Canterbury	1,517,797	803,997	840,097	764,448	592,287	710,932
Otago	1,932,326	1,539,155	1,670,975	1,405,192	1,528,591	1,577,830
Southland	1,269,045	1,270,110	1,453,682	971,595	789,982	877,833
NZ Total	32,709,576	21,396,407	21,254,107	23,442,779	23,684,796	24,179,502

Pulp log availability after incumbents' users supplied; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	31,432	26,641	38,659	45,787	38,938	36,602
Auckland	12,337	7,341	4,157	3,764	7,232	12,621
Waikato						
Bay of Plenty						
Gisborne	805,130	588,948	294,106	313,654	384,957	314,689
Hawkes Bay						
Taranaki	110,258	66,026	29,729	18,262	22,037	26,290
Manawatu-Wanganui	277,368	201,509	71,890	52,285	62,453	57,280
Wellington	262,468	185,229	93,076	76,071	133,205	172,976
Wairarapa	54,001	26,611	19,268	14,642	11,937	9,063
Tasman-Nelson						
Marlborough	268,776	174,501	174,501	174,501	174,501	174,501
West Coast	31,588	26,309	26,309	26,309	26,309	26,309
Canterbury	303,157	238,194				
Otago	373,475	319,299	308,222	372,384	337,291	277,881
Southland						
NZ Total	2,529,990	1,860,609	1,059,918	1,097,660	1,198,861	1,108,213

Pulp log energy availability after incumbents' users supplied; GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	216,882	183,823	266,750	315,928	268,671	252,552
Auckland	85,125	50,655	28,682	25,972	49,904	87,083
Waikato	-	-	-	-	-	-
Bay of Plenty	-	-	-	-	-	-
Gisborne	1,058,425	4,063,739	2,029,334	2,164,214	2,656,200	2,171,352
Hawkes Bay	-	-	-	-	-	-
Taranaki	760,782	455,579	205,132	126,008	152,057	181,400
Manawatu-Wanganui	1,913,841	1,390,414	496,040	360,767	430,927	395,233
Wellington	1,811,028	1,278,083	642,221	524,891	919,115	1,193,537
Wairarapa	372,609	183,616	132,948	101,027	82,369	62,537
Tasman-Nelson	-	-	-	-	-	-
Marlborough	1,854,555	1,204,059	1,204,059	1,204,059	1,204,059	1,204,059
West Coast	217,955	181,535	181,535	181,535	181,535	181,535
Canterbury	2,091,783	1,643,537	-	-	-	-
Otago	2,576,976	2,203,164	2,126,735	2,569,450	2,327,306	1,917,381
Southland	-	-	-	-	-	-
NZ Total	17,456,931	12,838,205	7,313,435	7,573,852	8,272,143	7,646,668

Pulp log availability after incumbent supply; recoverability level 95%; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	29,861	25,309	36,726	43,497	36,991	34,772
Auckland	11,720	6,974	3,949	3,576	6,871	11,990
Waikato	-	-	-	-	-	-
Bay of Plenty	-	-	-	-	-	-
Gisborne	764,873	559,500	279,401	297,972	365,709	298,954
Hawkes Bay	-	-	-	-	-	-
Taranaki	104,745	62,725	28,243	17,349	20,935	24,975
Manawatu-Wanganui	263,500	191,434	68,295	49,671	59,330	54,416
Wellington	249,344	175,968	88,422	72,268	126,545	164,328
Wairarapa	51,301	25,281	18,304	13,910	11,341	8,610
Tasman-Nelson	-	-	-	-	-	-
Marlborough	255,337	165,776	165,776	165,776	165,776	165,776
West Coast	30,008	24,994	24,994	24,994	24,994	24,994
Canterbury	287,999	226,284	-	-	-	-
Otago	354,801	303,334	292,811	353,765	320,426	263,987
Southland	-	-	-	-	-	-
NZ Total	2,403,490	1,767,579	1,006,922	1,042,777	1,138,918	1,052,802

Energy from pulp log availability after incumbent supply; recoverability level 95%; GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	206,038	174,632	253,412	300,132	255,238	239,924
Auckland	80,868	48,122	27,248	24,674	47,409	82,729
Waikato	-	-	-	-	-	-
Bay of Plenty	-	-	-	-	-	-
Gisborne	5,277,625	3,860,552	1,927,868	2,056,004	2,523,390	2,062,784
Hawkes Bay	-	-	-	-	-	-
Taranaki	722,743	432,800	194,875	119,708	144,454	172,330
Manawatu-Wanganui	1,818,149	1,320,893	471,238	342,729	409,380	375,472
Wellington	1,720,477	1,214,179	610,110	498,646	873,159	1,133,860
Wairarapa	353,978	174,435	126,300	95,976	78,250	59,410
Tasman-Nelson	-	-	-	-	-	-
Marlborough	1,761,827	1,143,856	1,143,856	1,143,856	1,143,856	1,143,856
West Coast	207,058	172,458	172,458	172,458	172,458	172,458
Canterbury	1,987,194	1,561,360	-	-	-	-
Otago	2,448,127	2,093,006	2,020,398	2,440,978	2,210,941	1,821,512
Southland	-	-	-	-	-	-
NZ Total	16,584,084	12,196,294	6,947,764	7,195,159	7,858,536	7,264,334

Pulp log availability after incumbent supply; recoverability level 2, 90%; m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	28,289	23,977	34,793	41,208	35,044	32,942
Auckland	11,103	6,607	3,741	3,388	6,509	11,359
Waikato	-	-	-	-	-	-
Bay of Plenty	-	-	-	-	-	-
Gisborne	724,617	530,053	264,696	282,289	346,461	283,220
Hawkes Bay	-	-	-	-	-	-
Taranaki	99,232	59,423	26,756	16,436	19,834	23,661
Manawatu-Wanganui	249,631	181,358	64,701	47,057	56,208	51,552
Wellington	236,221	166,706	83,768	68,464	119,885	155,679
Wairarapa	48,601	23,950	17,341	13,177	10,744	8,157
Tasman-Nelson	-	-	-	-	-	-
Marlborough	241,898	157,051	157,051	157,051	157,051	157,051
West Coast	28,429	23,678	23,678	23,678	23,678	23,678
Canterbury	272,841	214,374	-	-	-	-
Otago	336,127	287,369	277,400	335,146	303,562	250,093
Southland	-	-	-	-	-	-
NZ Total	2,276,991	1,674,548	953,926	987,894	1,078,975	997,391

Energy from pulp log availability after incumbent supply; recoverability level 90%; GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	195,194	165,441	240,075	284,335	241,804	227,297
Auckland	76,612	45,590	25,814	23,375	44,914	78,375
Waikato	-	-	-	-	-	-
Bay of Plenty	-	-	-	-	-	-
Gisborne	4,999,856	3,657,365	1,826,401	1,947,793	2,390,580	1,954,217
Hawkes Bay	-	-	-	-	-	-
Taranaki	684,704	410,021	184,619	113,408	136,851	163,260
Manawatu-Wanganui	1,722,457	1,251,373	446,436	324,690	387,834	355,710
Wellington	1,629,925	1,150,274	577,999	472,402	827,203	1,074,183
Wairarapa	335,348	165,255	119,653	90,924	74,132	56,283
Tasman-Nelson	-	-	-	-	-	-
Marlborough	1,669,100	1,083,653	1,083,653	1,083,653	1,083,653	1,083,653
West Coast	196,160	163,381	163,381	163,381	163,381	163,381
Canterbury	1,882,605	1,479,184	-	-	-	-
Otago	2,319,278	1,982,848	1,914,062	2,312,505	2,094,576	1,725,642
Southland	-	-	-	-	-	-
NZ Total	15,711,238	11,554,384	6,582,092	6,816,467	7,444,928	6,882,001

Appendix I – Planned production thinnings volumes

Logs from planned production thinnings, gross m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	62,794	29,391	62,704	78,106	44,646	62,647
Auckland	3,322	768	21,628	32,408	13,571	5,345
Waikato	5,401	5,311	35,618	47,562	18,555	6,701
Bay of Plenty	169,929	335,915	328,954	206,779	209,728	165,918
Gisborne	6,068	2,689	20,510	28,194	11,142	6,837
Hawkes Bay	39,686	111,158	78,592	7,142	9,334	9,311
Taranaki	2,667	1,763	10,916	18,973	8,678	1,526
Manawatu-Wanganui	22,431	11,594	65,800	112,785	53,991	17,843
Wellington	6,192	3,955	8,532	16,012	10,317	5,074
Wairarapa	1,119	486	7,515	12,667	6,215	1,695
Tasman-Nelson	1,406	1,161	12,240	17,489	6,754	1,750
Marlborough	5,421	5,382	24,975	31,486	9,559	3,088
West Coast	-	-	1,334	1,487	153	-
Canterbury	1,617	3,211	54,872	66,955	17,458	3,782
Otago	3,299	4,423	18,054	21,540	7,248	2,638
Southland	1,797	4,920	20,644	35,107	20,585	2,999
NZ Total	333,149	522,128	772,887	734,691	447,934	297,151

Energy from logs, planned production thinnings, gross GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	433,279	202,800	432,656	538,929	308,059	432,266
Auckland	22,923	5,302	149,235	223,618	93,642	36,880
Waikato	37,270	36,646	245,761	328,176	128,027	46,236
Bay of Plenty	1,172,513	2,317,814	2,269,785	1,426,773	1,447,123	1,144,834
Gisborne	41,870	18,557	141,516	194,535	76,878	47,172
Hawkes Bay	273,831	766,991	542,281	49,277	64,403	64,247
Taranaki	18,401	12,163	75,319	130,912	59,881	10,526
Manawatu-Wanganui	154,770	79,997	454,019	778,219	372,541	123,115
Wellington	42,728	27,290	58,867	110,483	71,187	35,009
Wairarapa	7,719	3,353	51,850	87,404	42,884	11,696
Tasman-Nelson	9,700	8,013	84,456	120,671	46,600	12,072
Marlborough	37,407	37,136	172,330	217,252	65,956	21,305
West Coast	-	-	9,207	10,262	1,056	-
Canterbury	11,158	22,155	378,620	461,989	120,462	26,096
Otago	22,761	30,517	124,571	148,625	50,010	18,199
Southland	12,399	33,945	142,446	242,241	142,034	20,692
NZ Total	2,298,728	3,602,680	5,332,918	5,069,366	3,090,743	2,050,344

Logs from planned production thinnings, m³ per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	50,235	23,513	50,163	62,484	35,717	50,118
Auckland	2,658	615	17,303	25,927	10,857	4,276
Waikato	4,321	4,249	28,494	38,049	14,844	5,361
Bay of Plenty	135,944	268,732	263,163	165,423	167,782	132,734
Gisborne	4,854	2,152	16,408	22,555	8,913	5,469
Hawkes Bay	31,748	88,926	62,873	5,713	7,467	7,449
Taranaki	2,133	1,410	8,733	15,178	6,943	1,220
Manawatu-Wanganui	17,944	9,275	52,640	90,228	43,193	14,274
Wellington	4,954	3,164	6,825	12,810	8,254	4,059
Wairarapa	895	389	6,012	10,134	4,972	1,356
Tasman-Nelson	1,125	929	9,792	13,991	5,403	1,400
Marlborough	4,337	4,306	19,980	25,189	7,647	2,470
West Coast	-	-	1,067	1,190	122	-
Canterbury	1,294	2,569	43,898	53,564	13,967	3,026
Otago	2,639	3,538	14,443	17,232	5,798	2,110
Southland	1,438	3,936	16,515	28,086	16,468	2,399
NZ Total	266,519	417,702	618,309	587,753	358,347	237,721

Logs from production thinnings, energy (GJ) per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	346,623	162,240	346,124	431,143	246,448	345,813
Auckland	18,339	4,242	119,388	178,894	74,914	29,504
Waikato	29,816	29,317	196,609	262,541	102,421	36,989
Bay of Plenty	938,010	1,854,251	1,815,828	1,141,418	1,157,699	915,867
Gisborne	33,496	14,845	113,212	155,628	61,503	37,737
Hawkes Bay	219,065	613,593	433,825	39,422	51,523	51,398
Taranaki	14,721	9,731	60,255	104,729	47,905	8,421
Manawatu-Wanganui	123,816	63,998	363,215	622,575	298,033	98,492
Wellington	34,182	21,832	47,094	88,387	56,949	28,007
Wairarapa	6,175	2,682	41,480	69,923	34,307	9,356
Tasman-Nelson	7,760	6,410	67,565	96,537	37,280	9,658
Marlborough	29,926	29,709	137,864	173,802	52,765	17,044
West Coast	-	-	7,365	8,210	845	-
Canterbury	8,926	17,724	302,896	369,591	96,370	20,877
Otago	18,209	24,414	99,657	118,900	40,008	14,560
Southland	9,919	27,156	113,957	193,793	113,628	16,554
NZ Total	1,838,982	2,882,144	4,266,335	4,055,493	2,472,595	1,640,275

Logs from planned production thinnings, m³ per annum, recoverability level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	37,676	17,635	37,622	46,863	26,788	37,588
Auckland	1,993	461	12,977	19,445	8,143	3,207
Waikato	3,241	3,187	21,371	28,537	11,133	4,021
Bay of Plenty	101,958	201,549	197,373	124,067	125,837	99,551
Gisborne	3,641	1,614	12,306	16,916	6,685	4,102
Hawkes Bay	23,811	66,695	47,155	4,285	5,600	5,587
Taranaki	1,600	1,058	6,549	11,384	5,207	915
Manawatu-Wanganui	13,458	6,956	39,480	67,671	32,395	10,706
Wellington	3,715	2,373	5,119	9,607	6,190	3,044
Wairarapa	671	292	4,509	7,600	3,729	1,017
Tasman-Nelson	843	697	7,344	10,493	4,052	1,050
Marlborough	3,253	3,229	14,985	18,891	5,735	1,853
West Coast	-	-	801	892	92	-
Canterbury	970	1,927	32,923	40,173	10,475	2,269
Otago	1,979	2,654	10,832	12,924	4,349	1,583
Southland	1,078	2,952	12,387	21,064	12,351	1,799
NZ Total	199,889	313,277	463,732	440,814	268,760	178,291

Logs from planned production thinnings, energy (GJ) per annum, recoverability level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	259,968	121,680	259,593	323,357	184,836	259,359
Auckland	13,754	3,181	89,541	134,171	56,185	22,128
Waikato	22,362	21,988	147,457	196,905	76,816	27,742
Bay of Plenty	703,508	1,390,689	1,361,871	856,064	868,274	686,900
Gisborne	25,122	11,134	84,909	116,721	46,127	28,303
Hawkes Bay	164,298	460,195	325,369	29,566	38,642	38,548
Taranaki	11,041	7,298	45,191	78,547	35,929	6,316
Manawatu-Wanganui	92,862	47,998	272,412	466,931	223,524	73,869
Wellington	25,637	16,374	35,320	66,290	42,712	21,005
Wairarapa	4,631	2,012	31,110	52,443	25,730	7,017
Tasman-Nelson	5,820	4,808	50,674	72,402	27,960	7,243
Marlborough	22,444	22,282	103,398	130,351	39,574	12,783
West Coast	-	-	5,524	6,157	633	-
Canterbury	6,695	13,293	227,172	277,193	72,277	15,657
Otago	13,657	18,310	74,743	89,175	30,006	10,920
Southland	7,439	20,367	85,467	145,345	85,221	12,415
NZ Total	1,379,237	2,161,608	3,199,751	3,041,619	1,854,446	1,230,206

Appendix J – Production thinning residues

Gross residues from planned production thinnings residues, m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	10,047	4,703	10,033	12,497	7,143	10,024
Auckland	532	123	3,461	5,185	2,171	855
Waikato	864	850	5,699	7,610	2,969	1,072
Bay of Plenty	27,189	53,746	52,633	33,085	33,556	26,547
Gisborne	971	430	3,282	4,511	1,783	1,094
Hawkes Bay	6,350	17,785	12,575	1,143	1,493	1,490
Taranaki	427	282	1,747	3,036	1,389	244
Manawatu-Wanganui	3,589	1,855	10,528	18,046	8,639	2,855
Wellington	991	633	1,365	2,562	1,651	812
Wairarapa	179	78	1,202	2,027	994	271
Tasman-Nelson	225	186	1,958	2,798	1,081	280
Marlborough	867	861	3,996	5,038	1,529	494
West Coast	0	0	213	238	24	0
Canterbury	259	514	8,780	10,713	2,793	605
Otago	528	708	2,889	3,446	1,160	422
Southland	288	787	3,303	5,617	3,294	480
NZ Total	97,582	143,360	171,563	144,363	96,331	77,751

Gross energy from planned production thinnings residues, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	69,325	32,448	69,225	86,229	49,290	69,163
Auckland	3,668	848	23,878	35,779	14,983	5,901
Waikato	5,963	5,863	39,322	52,508	20,484	7,398
Bay of Plenty	187,602	370,850	363,166	228,284	231,540	183,173
Gisborne	6,699	2,969	22,642	31,126	12,301	7,547
Hawkes Bay	43,813	122,719	86,765	7,884	10,305	10,280
Taranaki	2,944	1,946	12,051	20,946	9,581	1,684
Manawatu-Wanganui	24,763	12,800	72,643	124,515	59,607	19,698
Wellington	6,836	4,366	9,419	17,677	11,390	5,601
Wairarapa	1,235	536	8,296	13,985	6,861	1,871
Tasman-Nelson	1,552	1,282	13,513	19,307	7,456	1,932
Marlborough	5,985	5,942	27,573	34,760	10,553	3,409
West Coast	0	0	1,473	1,642	169	0
Canterbury	1,785	3,545	60,579	73,918	19,274	4,175
Otago	3,642	4,883	19,931	23,780	8,002	2,912
Southland	1,984	5,431	22,791	38,759	22,726	3,311
NZ Total	673,314	989,186	1,183,782	996,106	664,681	536,484

Residues from planned production thinnings residues, m³ per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	8,038	3,762	8,026	9,998	5,715	8,019
Auckland	425	98	2,768	4,148	1,737	684
Waikato	691	680	4,559	6,088	2,375	858
Bay of Plenty	21,751	42,997	42,106	26,468	26,845	21,237
Gisborne	777	344	2,625	3,609	1,426	875
Hawkes Bay	5,080	14,228	10,060	914	1,195	1,192
Taranaki	341	226	1,397	2,429	1,111	195
Manawatu-Wanganui	2,871	1,484	8,422	14,437	6,911	2,284
Wellington	793	506	1,092	2,050	1,321	649
Wairarapa	143	62	962	1,621	796	217
Tasman-Nelson	180	149	1,567	2,239	864	224
Marlborough	694	689	3,197	4,030	1,224	395
West Coast	0	0	171	190	20	0
Canterbury	207	411	7,024	8,570	2,235	484
Otago	422	566	2,311	2,757	928	338
Southland	230	630	2,642	4,494	2,635	384
NZ Total	78,065	114,688	137,250	115,491	77,064	62,201

Residues from planned production residues, energy (GJ) per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	55,460	25,958	55,380	68,983	39,432	55,330
Auckland	2,934	679	19,102	28,623	11,986	4,721
Waikato	4,771	4,691	31,457	42,006	16,387	5,918
Bay of Plenty	150,082	296,680	290,532	182,627	185,232	146,539
Gisborne	5,359	2,375	18,114	24,900	9,840	6,038
Hawkes Bay	35,050	98,175	69,412	6,307	8,244	8,224
Taranaki	2,355	1,557	9,641	16,757	7,665	1,347
Manawatu-Wanganui	19,811	10,240	58,114	99,612	47,685	15,759
Wellington	5,469	3,493	7,535	14,142	9,112	4,481
Wairarapa	988	429	6,637	11,188	5,489	1,497
Tasman-Nelson	1,242	1,026	10,810	15,446	5,965	1,545
Marlborough	4,788	4,753	22,058	27,808	8,442	2,727
West Coast	0	0	1,178	1,314	135	0
Canterbury	1,428	2,836	48,463	59,135	15,419	3,340
Otago	2,913	3,906	15,945	19,024	6,401	2,330
Southland	1,587	4,345	18,233	31,007	18,180	2,649
NZ Total	538,651	791,349	947,025	796,885	531,745	429,188

Residues from planned production thinnings, m³ per annum, recoverability level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	5,024	2,351	5,016	6,248	3,572	5,012
Auckland	266	61	1,730	2,593	1,086	428
Waikato	432	425	2,849	3,805	1,484	536
Bay of Plenty	13,594	26,873	26,316	16,542	16,778	13,273
Gisborne	485	215	1,641	2,255	891	547
Hawkes Bay	3,175	8,893	6,287	571	747	745
Taranaki	213	141	873	1,518	694	122
Manawatu-Wanganui	1,794	928	5,264	9,023	4,319	1,427
Wellington	495	316	683	1,281	825	406
Wairarapa	89	39	601	1,013	497	136
Tasman-Nelson	112	93	979	1,399	540	140
Marlborough	434	431	1,998	2,519	765	247
West Coast	0	0	107	119	12	0
Canterbury	129	257	4,390	5,356	1,397	303
Otago	264	354	1,444	1,723	580	211
Southland	144	394	1,652	2,809	1,647	240
NZ Total	48,791	71,680	85,781	72,182	48,165	38,876

Residues from planned production thinnings, energy (GJ) per annum, recoverability level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	34,662	16,224	34,612	43,114	24,645	34,581
Auckland	1,834	424	11,939	17,889	7,491	2,950
Waikato	2,982	2,932	19,661	26,254	10,242	3,699
Bay of Plenty	93,801	185,425	181,583	114,142	115,770	91,587
Gisborne	3,350	1,485	11,321	15,563	6,150	3,774
Hawkes Bay	21,906	61,359	43,383	3,942	5,152	5,140
Taranaki	1,472	973	6,026	10,473	4,790	842
Manawatu-Wanganui	12,382	6,400	36,322	62,257	29,803	9,849
Wellington	3,418	2,183	4,709	8,839	5,695	2,801
Wairarapa	618	268	4,148	6,992	3,431	936
Tasman-Nelson	776	641	6,756	9,654	3,728	966
Marlborough	2,993	2,971	13,786	17,380	5,277	1,704
West Coast	0	0	737	821	84	0
Canterbury	893	1,772	30,290	36,959	9,637	2,088
Otago	1,821	2,441	9,966	11,890	4,001	1,456
Southland	992	2,716	11,396	19,379	11,363	1,655
NZ Total	336,657	494,593	591,891	498,053	332,340	268,242

Appendix K - potential volume from expanded production thinnings

Stem volume from potential expansion of production thinnings, gross m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	62,794	29,391	62,704	78,106	44,646	62,647
Auckland	3,322	768	21,628	32,408	13,571	5,345
Waikato	5,401	5,311	35,618	47,562	18,555	6,701
Bay of Plenty	169,929	335,915	328,954	206,779	209,728	165,918
Gisborne	6,068	2,689	20,510	28,194	11,142	6,837
Hawkes Bay	39,686	111,158	78,592	7,142	9,334	9,311
Taranaki	2,667	1,763	10,916	18,973	8,678	1,526
Manawatu-Wanganui	22,431	11,594	65,800	112,785	53,991	17,843
Wairarapa	6,192	3,955	8,532	16,012	10,317	5,074
Wellington	1,119	486	7,515	12,667	6,215	1,695
Tasman-Nelson	1,406	1,161	12,240	17,489	6,754	1,750
Marlborough	5,421	5,382	24,975	31,486	9,559	3,088
West Coast	-	-	1,334	1,487	153	-
Canterbury	1,617	3,211	54,872	66,955	17,458	3,782
Otago	3,299	4,423	18,054	21,540	7,248	2,638
Southland	1,797	4,920	20,644	35,107	20,585	2,999
New Zealand	333,149	522,128	772,887	734,691	447,934	297,151

Energy from potential expansion of production thinnings, gross GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	433,279	202,800	432,656	538,929	308,059	432,266
Auckland	22,923	5,302	149,235	223,618	93,642	36,880
Waikato	37,270	36,646	245,761	328,176	128,027	46,236
Bay of Plenty	1,172,513	2,317,814	2,269,785	1,426,773	1,447,123	1,144,834
Gisborne	41,870	18,557	141,516	194,535	76,878	47,172
Hawkes Bay	273,831	766,991	542,281	49,277	64,403	64,247
Taranaki	18,401	12,163	75,319	130,912	59,881	10,526
Manawatu-Wanganui	154,770	79,997	454,019	778,219	372,541	123,115
Wairarapa	42,728	27,290	58,867	110,483	71,187	35,009
Wellington	7,719	3,353	51,850	87,404	42,884	11,696
Tasman-Nelson	9,700	8,013	84,456	120,671	46,600	12,072
Marlborough	37,407	37,136	172,330	217,252	65,956	21,305
West Coast	-	-	9,207	10,262	1,056	-
Canterbury	11,158	22,155	378,620	461,989	120,462	26,096
Otago	22,761	30,517	124,571	148,625	50,010	18,199
Southland	12,399	33,945	142,446	242,241	142,034	20,692
New Zealand	2,298,728	3,602,680	5,332,918	5,069,366	3,090,743	2,050,344

Stem volume from potential expansion of production thinnings, Rec. level 1, 80% m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	50,235	23,513	50,163	62,484	35,717	50,118
Auckland	2,658	615	17,303	25,927	10,857	4,276
Waikato	4,321	4,249	28,494	38,049	14,844	5,361
Bay of Plenty	135,944	268,732	263,163	165,423	167,782	132,734
Gisborne	4,854	2,152	16,408	22,555	8,913	5,469
Hawkes Bay	31,748	88,926	62,873	5,713	7,467	7,449
Taranaki	2,133	1,410	8,733	15,178	6,943	1,220
Manawatu-Wanganui	17,944	9,275	52,640	90,228	43,193	14,274
Wairarapa	4,954	3,164	6,825	12,810	8,254	4,059
Wellington	895	389	6,012	10,134	4,972	1,356
Tasman-Nelson	1,125	929	9,792	13,991	5,403	1,400
Marlborough	4,337	4,306	19,980	25,189	7,647	2,470
West Coast	-	-	1,067	1,190	122	-
Canterbury	1,294	2,569	43,898	53,564	13,967	3,026
Otago	2,639	3,538	14,443	17,232	5,798	2,110
Southland	1,438	3,936	16,515	28,086	16,468	2,399
New Zealand	266,519	417,702	618,309	587,753	358,347	237,721

Energy from potential expansion of production thinnings, Rec. level 1, 80%, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	346,623	162,240	346,124	431,143	246,448	345,813
Auckland	18,339	4,242	119,388	178,894	74,914	29,504
Waikato	29,816	29,317	196,609	262,541	102,421	36,989
Bay of Plenty	938,010	1,854,251	1,815,828	1,141,418	1,157,699	915,867
Gisborne	33,496	14,845	113,212	155,628	61,503	37,737
Hawkes Bay	219,065	613,593	433,825	39,422	51,523	51,398
Taranaki	14,721	9,731	60,255	104,729	47,905	8,421
Manawatu-Wanganui	123,816	63,998	363,215	622,575	298,033	98,492
Wairarapa	34,182	21,832	47,094	88,387	56,949	28,007
Wellington	6,175	2,682	41,480	69,923	34,307	9,356
Tasman-Nelson	7,760	6,410	67,565	96,537	37,280	9,658
Marlborough	29,926	29,709	137,864	173,802	52,765	17,044
West Coast	-	-	7,365	8,210	845	-
Canterbury	8,926	17,724	302,896	369,591	96,370	20,877
Otago	18,209	24,414	99,657	118,900	40,008	14,560
Southland	9,919	27,156	113,957	193,793	113,628	16,554
New Zealand	1,838,982	2,882,144	4,266,335	4,055,493	2,472,595	1,640,275

Stem volume from potential expansion of production thinnings, Rec. level 2, 60% m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	37,676	17,635	37,622	46,863	26,788	37,588
Auckland	1,993	461	12,977	19,445	8,143	3,207
Waikato	3,241	3,187	21,371	28,537	11,133	4,021
Bay of Plenty	101,958	201,549	197,373	124,067	125,837	99,551
Gisborne	3,641	1,614	12,306	16,916	6,685	4,102
Hawkes Bay	23,811	66,695	47,155	4,285	5,600	5,587
Taranaki	1,600	1,058	6,549	11,384	5,207	915
Manawatu-Wanganui	13,458	6,956	39,480	67,671	32,395	10,706
Wairarapa	3,715	2,373	5,119	9,607	6,190	3,044
Wellington	671	292	4,509	7,600	3,729	1,017
Tasman-Nelson	843	697	7,344	10,493	4,052	1,050
Marlborough	3,253	3,229	14,985	18,891	5,735	1,853
West Coast	-	-	801	892	92	-
Canterbury	970	1,927	32,923	40,173	10,475	2,269
Otago	1,979	2,654	10,832	12,924	4,349	1,583
Southland	1,078	2,952	12,387	21,064	12,351	1,799
New Zealand	199,889	313,277	463,732	440,814	268,760	178,291

Energy from potential expansion of production thinnings, Rec. level 2, 60%, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	259,968	121,680	259,593	323,357	184,836	259,359
Auckland	13,754	3,181	89,541	134,171	56,185	22,128
Waikato	22,362	21,988	147,457	196,905	76,816	27,742
Bay of Plenty	703,508	1,390,689	1,361,871	856,064	868,274	686,900
Gisborne	25,122	11,134	84,909	116,721	46,127	28,303
Hawkes Bay	164,298	460,195	325,369	29,566	38,642	38,548
Taranaki	11,041	7,298	45,191	78,547	35,929	6,316
Manawatu-Wanganui	92,862	47,998	272,412	466,931	223,524	73,869
Wairarapa	25,637	16,374	35,320	66,290	42,712	21,005
Wellington	4,631	2,012	31,110	52,443	25,730	7,017
Tasman-Nelson	5,820	4,808	50,674	72,402	27,960	7,243
Marlborough	22,444	22,282	103,398	130,351	39,574	12,783
West Coast	-	-	5,524	6,157	633	-
Canterbury	6,695	13,293	227,172	277,193	72,277	15,657
Otago	13,657	18,310	74,743	89,175	30,006	10,920
Southland	7,439	20,367	85,467	145,345	85,221	12,415
New Zealand	1,379,237	2,161,608	3,199,751	3,041,619	1,854,446	1,230,206

Appendix L – Waste thinnings

Gross waste thinnings biomass, green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	118,682	84,636	67,384	144,800	181,616	153,290
Auckland	34,141	41,507	22,402	14,732	5,404	26,979
Waikato	205,619	166,804	91,159	114,862	115,312	140,640
Bay of Plenty	205,901	277,406	231,387	327,199	304,823	180,245
Gisborne	85,996	56,902	24,118	55,018	51,005	55,923
Hawkes Bay	70,961	86,902	60,303	60,172	77,210	131,850
Taranaki	11,032	4,933	2,126	2,025	2,113	12,240
Manawatu-Wanganui	44,723	17,600	10,350	9,811	10,485	12,031
Wellington	66,942	31,948	12,805	29,683	35,718	56,156
Wairarapa	5,785	5,534	3,726	2,878	2,063	2,126
Tasman-Nelson	21,617	34,619	34,668	29,639	23,054	28,821
Marlborough	40,996	28,536	23,503	39,403	45,494	26,089
West Coast	14,637	24,024	30,078	26,430	27,532	28,081
Canterbury	62,917	45,643	23,519	29,126	33,127	33,168
Otago	64,709	64,634	31,479	48,598	56,339	84,748
Southland	52,452	50,553	26,276	34,237	38,462	44,303
NZ Total	1,107,110	1,022,181	695,282	968,612	1,009,755	1,016,688

Gross waste thinnings energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	818,906	583,987	464,947	999,121	1,253,152	1,057,700
Auckland	235,575	286,401	154,571	101,652	37,289	186,157
Waikato	1,418,770	1,150,946	628,995	792,550	795,650	970,415
Bay of Plenty	1,420,717	1,914,101	1,596,570	2,257,672	2,103,277	1,243,691
Gisborne	593,370	392,621	166,412	379,626	351,933	385,867
Hawkes Bay	489,629	599,623	416,091	415,189	532,752	909,764
Taranaki	76,124	34,039	14,669	13,970	14,582	84,453
Manawatu-Wanganui	308,590	121,442	71,414	67,695	72,344	83,011
Wellington	461,896	220,439	88,355	204,814	246,454	387,474
Wairarapa	39,916	38,188	25,712	19,855	14,233	14,672
Tasman-Nelson	149,155	238,871	239,207	204,507	159,070	198,864
Marlborough	282,870	196,898	162,168	271,878	313,905	180,013
West Coast	100,997	165,764	207,542	182,366	189,973	193,756
Canterbury	434,127	314,937	162,282	200,970	228,574	228,858
Otago	446,495	445,973	217,205	335,328	388,738	584,758
Southland	361,920	348,818	181,307	236,233	265,388	305,693
NZ Total	7,639,057	7,053,049	4,797,448	6,683,425	6,967,313	7,015,145

Waste thinnings biomass (green tonnes per annum), recoverability level 1, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	59,341	42,318	33,692	72,400	90,808	76,645
Auckland	17,071	20,754	11,201	7,366	2,702	13,490
Waikato	102,809	83,402	45,579	57,431	57,656	70,320
Bay of Plenty	102,951	138,703	115,694	163,599	152,411	90,123
Gisborne	42,998	28,451	12,059	27,509	25,502	27,961
Hawkes Bay	35,480	43,451	30,151	30,086	38,605	65,925
Taranaki	5,516	2,467	1,063	1,012	1,057	6,120
Manawatu-Wanganui	22,362	8,800	5,175	4,905	5,242	6,015
Wellington	33,471	15,974	6,403	14,842	17,859	28,078
Wairarapa	2,892	2,767	1,863	1,439	1,031	1,063
Tasman-Nelson	10,808	17,310	17,334	14,819	11,527	14,410
Marlborough	20,498	14,268	11,751	19,701	22,747	13,044
West Coast	7,319	12,012	15,039	13,215	13,766	14,040
Canterbury	31,458	22,822	11,760	14,563	16,563	16,584
Otago	32,355	32,317	15,740	24,299	28,169	42,374
Southland	26,226	25,277	13,138	17,118	19,231	22,152
NZ Total	553,555	511,091	347,641	484,306	504,878	508,344

Waste thinnings energy (GJ) per annum, recoverability level 1, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	409,453	291,993	232,473	499,560	626,576	528,850
Auckland	117,787	143,200	77,286	50,826	18,645	93,078
Waikato	709,385	575,473	314,497	396,275	397,825	485,207
Bay of Plenty	710,359	957,051	798,285	1,128,836	1,051,638	621,846
Gisborne	296,685	196,311	83,206	189,813	175,967	192,934
Hawkes Bay	244,815	299,811	208,045	207,594	266,376	454,882
Taranaki	38,062	17,020	7,335	6,985	7,291	42,227
Manawatu-Wanganui	154,295	60,721	35,707	33,847	36,172	41,505
Wellington	230,948	110,220	44,178	102,407	123,227	193,737
Wairarapa	19,958	19,094	12,856	9,928	7,116	7,336
Tasman-Nelson	74,578	119,436	119,604	102,254	79,535	99,432
Marlborough	141,435	98,449	81,084	135,939	156,953	90,006
West Coast	50,498	82,882	103,771	91,183	94,987	96,878
Canterbury	217,063	157,469	81,141	100,485	114,287	114,429
Otago	223,247	222,987	108,603	167,664	194,369	292,379
Southland	180,960	174,409	90,654	118,116	132,694	152,846
NZ Total	3,819,529	3,526,524	2,398,724	3,341,713	3,483,656	3,507,572

Waste thinnings biomass (green tonnes per annum), recoverability level 2, 25%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	29,670	21,159	16,846	36,200	45,404	38,322
Auckland	8,535	10,377	5,600	3,683	1,351	6,745
Waikato	51,405	41,701	22,790	28,716	28,828	35,160
Bay of Plenty	51,475	69,351	57,847	81,800	76,206	45,061
Gisborne	21,499	14,225	6,029	13,755	12,751	13,981
Hawkes Bay	17,740	21,725	15,076	15,043	19,303	32,962
Taranaki	2,758	1,233	532	506	528	3,060
Manawatu-Wanganui	11,181	4,400	2,587	2,453	2,621	3,008
Wellington	16,735	7,987	3,201	7,421	8,929	14,039
Wairarapa	1,446	1,384	932	719	516	532
Tasman-Nelson	5,404	8,655	8,667	7,410	5,763	7,205
Marlborough	10,249	7,134	5,876	9,851	11,373	6,522
West Coast	3,659	6,006	7,520	6,607	6,883	7,020
Canterbury	15,729	11,411	5,880	7,282	8,282	8,292
Otago	16,177	16,158	7,870	12,150	14,085	21,187
Southland	13,113	12,638	6,569	8,559	9,615	11,076
NZ Total	276,777	255,545	173,821	242,153	252,439	254,172

Waste thinnings energy (GJ) per annum, recoverability level 2, 25%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	204,726	145,997	116,237	249,780	313,288	264,425
Auckland	58,894	71,600	38,643	25,413	9,322	46,539
Waikato	354,692	287,737	157,249	198,138	198,913	242,604
Bay of Plenty	355,179	478,525	399,143	564,418	525,819	310,923
Gisborne	148,343	98,155	41,603	94,906	87,983	96,467
Hawkes Bay	122,407	149,906	104,023	103,797	133,188	227,441
Taranaki	19,031	8,510	3,667	3,492	3,646	21,113
Manawatu-Wanganui	77,148	30,361	17,853	16,924	18,086	20,753
Wellington	115,474	55,110	22,089	51,204	61,614	96,868
Wairarapa	9,979	9,547	6,428	4,964	3,558	3,668
Tasman-Nelson	37,289	59,718	59,802	51,127	39,767	49,716
Marlborough	70,718	49,225	40,542	67,970	78,476	45,003
West Coast	25,249	41,441	51,885	45,591	47,493	48,439
Canterbury	108,532	78,734	40,571	50,243	57,143	57,214
Otago	111,624	111,493	54,301	83,832	97,184	146,190
Southland	90,480	87,204	45,327	59,058	66,347	76,423
NZ Total	1,909,764	1,763,262	1,199,362	1,670,856	1,741,828	1,753,786

Appendix M – Pruning residues

Gross pruning biomass, odt per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,052	10,192	3,070	1,976	2,168	2,052
Auckland	120	2,528	1,094	571	267	120
Waikato	4,537	11,525	4,460	1,559	2,670	4,537
Bay of Plenty	12,909	20,523	20,171	13,836	9,747	12,909
Gisborne	2,263	12,092	5,781	5,049	4,696	2,263
Hawkes Bay	14,971	10,824	9,061	7,248	11,139	14,971
Taranaki	200	2,113	795	216	275	200
Manawatu-Wanganui	808	6,922	2,449	1,015	1,051	808
Wellington	2,333	6,079	3,203	2,989	3,228	2,333
Wairarapa	54	768	374	110	83	54
Tasman-Nelson	415	2,994	1,133	297	512	415
Marlborough	1,065	5,150	2,219	1,155	1,479	1,065
West Coast	0	1,919	1,424	331	15	0
Canterbury	384	5,471	1,878	837	619	384
Otago	5,907	9,337	4,917	2,840	3,923	5,907
Southland	1,057	4,340	2,709	2,272	2,077	1,057
NZ Total	49,075	112,779	64,737	42,302	43,949	49,075

Gross Prunings, energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	14,160	70,328	21,182	13,637	14,962	14,160
Auckland	828	17,446	7,551	3,937	1,839	828
Waikato	31,307	79,526	30,773	10,758	18,422	31,307
Bay of Plenty	89,070	141,608	139,177	95,467	67,254	89,070
Gisborne	15,616	83,436	39,886	34,840	32,402	15,616
Hawkes Bay	103,300	74,689	62,518	50,011	76,862	103,300
Taranaki	1,383	14,582	5,482	1,487	1,900	1,383
Manawatu-Wanganui	5,575	47,763	16,900	7,002	7,249	5,575
Wellington	16,095	41,943	22,097	20,624	22,275	16,095
Wairarapa	372	5,302	2,580	758	575	372
Tasman-Nelson	2,862	20,656	7,818	2,051	3,530	2,862
Marlborough	7,347	35,537	15,314	7,972	10,203	7,347
West Coast	-	13,242	9,826	2,284	105	-
Canterbury	2,653	37,748	12,960	5,779	4,268	2,653
Otago	40,758	64,424	33,928	19,599	27,065	40,758
Southland	7,292	29,947	18,692	15,677	14,335	7,292
NZ Total	338,617	778,178	446,684	291,883	303,246	338,617

Pruning biomass residues, green tonnes per annum, recovery level 1, 30%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	616	3,058	921	593	651	616
Auckland	36	759	328	171	80	36
Waikato	1,361	3,458	1,338	468	801	1,361
Bay of Plenty	3,873	6,157	6,051	4,151	2,924	3,873
Gisborne	679	3,628	1,734	1,515	1,409	679
Hawkes Bay	4,491	3,247	2,718	2,174	3,342	4,491
Taranaki	60	634	238	65	83	60
Manawatu-Wanganui	242	2,077	735	304	315	242
Wellington	700	1,824	961	897	968	700
Wairarapa	16	231	112	33	25	16
Tasman-Nelson	124	898	340	89	153	124
Marlborough	319	1,545	666	347	444	319
West Coast	0	576	427	99	5	0
Canterbury	115	1,641	563	251	186	115
Otago	1,772	2,801	1,475	852	1,177	1,772
Southland	317	1,302	813	682	623	317
NZ Total	14,722	33,834	19,421	12,691	13,185	14,722

Pruning biomass energy (GJ) per annum, recovery level 1, 30%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	4,248	21,098	6,355	4,091	4,489	4,248
Auckland	248	5,234	2,265	1,181	552	248
Waikato	9,392	23,858	9,232	3,227	5,527	9,392
Bay of Plenty	26,721	42,483	41,753	28,640	20,176	26,721
Gisborne	4,685	25,031	11,966	10,452	9,721	4,685
Hawkes Bay	30,990	22,407	18,756	15,003	23,058	30,990
Taranaki	415	4,374	1,645	446	570	415
Manawatu-Wanganui	1,673	14,329	5,070	2,101	2,175	1,673
Wellington	4,829	12,583	6,629	6,187	6,682	4,829
Wairarapa	112	1,591	774	227	173	112
Tasman-Nelson	859	6,197	2,345	615	1,059	859
Marlborough	2,204	10,661	4,594	2,392	3,061	2,204
West Coast	-	3,973	2,948	685	31	-
Canterbury	796	11,324	3,888	1,734	1,280	796
Otago	12,227	19,327	10,178	5,880	8,120	12,227
Southland	2,188	8,984	5,608	4,703	4,300	2,188
NZ Total	101,585	233,453	134,005	87,565	90,974	101,585

Pruning biomass residues, green tonnes per annum, recovery level 2, 15%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	308	1,529	460	296	325	308
Auckland	18	379	164	86	40	18
Waikato	681	1,729	669	234	400	681
Bay of Plenty	1,936	3,078	3,026	2,075	1,462	1,936
Gisborne	339	1,814	867	757	704	339
Hawkes Bay	2,246	1,624	1,359	1,087	1,671	2,246
Taranaki	30	317	119	32	41	30
Manawatu-Wanganui	121	1,038	367	152	158	121
Wellington	350	912	480	448	484	350
Wairarapa	8	115	56	16	13	8
Tasman-Nelson	62	449	170	45	77	62
Marlborough	160	773	333	173	222	160
West Coast	0	288	214	50	2	0
Canterbury	58	821	282	126	93	58
Otago	886	1,401	738	426	588	886
Southland	159	651	406	341	312	159
NZ Total	7,361	16,917	9,711	6,345	6,592	7,361

Pruning biomass energy (GJ) per annum, recovery level 2, 15%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,124	10,549	3,177	2,046	2,244	2,124
Auckland	124	2,617	1,133	590	276	124
Waikato	4,696	11,929	4,616	1,614	2,763	4,696
Bay of Plenty	13,360	21,241	20,876	14,320	10,088	13,360
Gisborne	2,342	12,515	5,983	5,226	4,860	2,342
Hawkes Bay	15,495	11,203	9,378	7,502	11,529	15,495
Taranaki	207	2,187	822	223	285	207
Manawatu-Wanganui	836	7,164	2,535	1,050	1,087	836
Wellington	2,414	6,291	3,315	3,094	3,341	2,414
Wairarapa	56	795	387	114	86	56
Tasman-Nelson	429	3,098	1,173	308	529	429
Marlborough	1,102	5,331	2,297	1,196	1,530	1,102
West Coast	-	1,986	1,474	343	16	-
Canterbury	398	5,662	1,944	867	640	398
Otago	6,114	9,664	5,089	2,940	4,060	6,114
Southland	1,094	4,492	2,804	2,352	2,150	1,094
NZ Total	50,793	116,727	67,003	43,782	45,487	50,793

Appendix N - In-forest residues by sub-category – Landing residues

Gross supply – in-forests residues, landings, m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	244,970	132,217	187,476	276,436	273,004	194,251
Auckland	92,037	56,006	32,090	17,792	27,378	59,412
Waikato	348,531	217,912	148,187	154,239	161,276	215,553
Bay of Plenty	682,500	589,819	637,751	714,054	652,887	631,510
Gisborne	278,530	120,684	116,807	154,684	152,358	163,234
Hawkes Bay	168,398	140,194	116,125	147,220	224,147	222,170
Taranaki	45,918	11,242	6,555	6,704	19,407	23,574
Manawatu-Wanganui	132,646	39,820	26,068	25,798	24,205	38,017
Wellington	19,119	4,540	1,336	867	1,658	4,819
Wairarapa	148,954	45,022	42,786	65,550	91,666	88,610
Tasman-Nelson	146,503	118,351	106,487	103,801	101,124	127,338
Marlborough	144,596	64,490	76,328	100,155	85,480	66,329
West Coast	15,666	13,687	15,936	15,619	15,525	12,819
Canterbury	131,982	69,913	73,052	66,474	51,503	61,820
Otago	168,028	133,840	145,302	122,191	132,921	137,203
Southland	110,352	110,444	126,407	84,487	68,694	76,333
NZ Total	2,878,732	1,868,181	1,858,693	2,056,070	2,083,233	2,122,992

Gross supply - in-forest residues, landings, energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,690,294	912,296	1,293,585	1,907,410	1,883,728	1,340,329
Auckland	635,055	386,442	221,419	122,764	188,906	409,943
Waikato	2,404,862	1,503,592	1,022,488	1,064,247	1,112,805	1,487,317
Bay of Plenty	4,709,250	4,069,752	4,400,480	4,926,973	4,504,920	4,357,422
Gisborne	1,921,857	832,721	805,970	1,067,319	1,051,267	1,126,317
Hawkes Bay	1,161,948	967,341	801,261	1,015,816	1,546,614	1,532,972
Taranaki	316,836	77,570	45,230	46,260	133,906	162,661
Manawatu-Wanganui	915,260	274,760	179,871	178,007	167,016	262,318
Wellington	131,922	31,325	9,216	5,985	11,437	33,254
Wairarapa	1,027,784	310,652	295,224	452,296	632,499	611,408
Tasman-Nelson	1,010,874	816,624	734,761	716,224	697,754	878,634
Marlborough	997,714	444,978	526,664	691,070	589,814	457,667
West Coast	108,099	94,441	109,958	107,768	107,123	88,448
Canterbury	910,678	482,398	504,058	458,669	355,372	426,559
Otago	1,159,396	923,493	1,002,585	843,115	917,155	946,698
Southland	761,427	762,066	872,209	582,957	473,989	526,700
NZ Total	19,863,254	12,890,451	12,824,979	14,186,880	14,374,304	14,648,646

In-forest landing residues, volume (m³) per annum), recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	195,976	105,773	149,981	221,149	218,403	155,400
Auckland	73,630	44,805	25,672	14,234	21,902	47,530
Waikato	278,825	174,329	118,549	123,391	129,021	172,442
Bay of Plenty	546,000	471,855	510,201	571,243	522,310	505,208
Gisborne	222,824	96,547	93,446	123,747	121,886	130,587
Hawkes Bay	134,719	112,155	92,900	117,776	179,318	177,736
Taranaki	36,735	8,994	5,244	5,363	15,525	18,859
Manawatu-Wanganui	106,117	31,856	20,855	20,639	19,364	30,414
Wellington	15,295	3,632	1,069	694	1,326	3,856
Wairarapa	119,163	36,018	34,229	52,440	73,333	70,888
Tasman-Nelson	117,203	94,681	85,190	83,040	80,899	101,871
Marlborough	115,677	51,592	61,063	80,124	68,384	53,063
West Coast	12,533	10,950	12,749	12,495	12,420	10,255
Canterbury	105,586	55,930	58,442	53,179	41,203	49,456
Otago	134,423	107,072	116,242	97,752	106,337	109,762
Southland	88,281	88,355	101,126	67,589	54,955	61,067
NZ Total	2,302,986	1,494,545	1,486,954	1,644,856	1,666,586	1,698,394

In-forest landing residues, energy (GJ) per annum, recoverability level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,352,235	729,837	1,034,868	1,525,928	1,506,983	1,072,263
Auckland	508,044	309,153	177,135	98,211	151,124	327,954
Waikato	1,923,890	1,202,873	817,991	851,398	890,244	1,189,853
Bay of Plenty	3,767,400	3,255,802	3,520,384	3,941,578	3,603,936	3,485,938
Gisborne	1,537,486	666,177	644,776	853,855	841,014	901,053
Hawkes Bay	929,558	773,873	641,009	812,653	1,237,291	1,226,377
Taranaki	253,469	62,056	36,184	37,008	107,125	130,129
Manawatu-Wanganui	732,208	219,808	143,896	142,406	133,613	209,855
Wellington	105,538	25,060	7,373	4,788	9,150	26,604
Wairarapa	822,227	248,522	236,179	361,837	505,999	489,126
Tasman-Nelson	808,699	653,299	587,809	572,979	558,203	702,907
Marlborough	798,171	355,982	421,332	552,856	471,851	366,134
West Coast	86,479	75,552	87,966	86,215	85,698	70,758
Canterbury	728,542	385,918	403,246	366,935	284,298	341,247
Otago	927,517	738,794	802,068	674,492	733,724	757,358
Southland	609,142	609,653	697,767	466,366	379,191	421,360
NZ Total	15,890,603	10,312,361	10,259,983	11,349,504	11,499,444	11,718,917

In-forest landing residues, volume (m³) per annum), recoverability level 2, 65%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	159,231	85,941	121,859	179,684	177,453	126,263
Auckland	59,824	36,404	20,858	11,565	17,795	38,618
Waikato	226,545	141,643	96,321	100,255	104,829	140,110
Bay of Plenty	443,625	383,382	414,538	464,135	424,376	410,482
Gisborne	181,045	78,445	75,925	100,545	99,032	106,102
Hawkes Bay	109,459	91,126	75,481	95,693	145,695	144,410
Taranaki	29,847	7,307	4,261	4,358	12,614	15,323
Manawatu-Wanganui	86,220	25,883	16,944	16,769	15,733	24,711
Wellington	12,427	2,951	868	564	1,077	3,133
Wairarapa	96,820	29,264	27,811	42,608	59,583	57,596
Tasman-Nelson	95,227	76,928	69,217	67,470	65,730	82,770
Marlborough	93,988	41,918	49,613	65,101	55,562	43,114
West Coast	10,183	8,897	10,358	10,152	10,091	8,332
Canterbury	85,789	45,443	47,484	43,208	33,477	40,183
Otago	109,218	86,996	94,446	79,424	86,399	89,182
Southland	71,729	71,789	82,165	54,916	44,651	49,617
NZ Total	1,871,176	1,214,318	1,208,150	1,336,445	1,354,101	1,379,945

In-forest landing residues, energy (GJ) per annum, recoverability level 2, 65%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,098,691	592,992	840,831	1,239,816	1,224,423	871,214
Auckland	412,786	251,187	143,922	79,797	122,789	266,463
Waikato	1,563,160	977,335	664,617	691,760	723,323	966,756
Bay of Plenty	3,061,012	2,645,339	2,860,312	3,202,532	2,928,198	2,832,324
Gisborne	1,249,207	541,269	523,880	693,757	683,324	732,106
Hawkes Bay	755,266	628,771	520,819	660,280	1,005,299	996,432
Taranaki	205,944	50,421	29,399	30,069	87,039	105,730
Manawatu-Wanganui	594,919	178,594	116,916	115,705	108,561	170,507
Wellington	85,749	20,362	5,991	3,891	7,434	21,615
Wairarapa	668,059	201,924	191,896	293,993	411,124	397,415
Tasman-Nelson	657,068	530,806	477,594	465,545	453,540	571,112
Marlborough	648,514	289,236	342,332	449,196	383,379	297,484
West Coast	70,264	61,386	71,473	70,049	69,630	57,491
Canterbury	591,941	313,559	327,638	298,135	230,992	277,264
Otago	753,607	600,270	651,680	548,025	596,151	615,354
Southland	494,928	495,343	566,936	378,922	308,093	342,355
NZ Total	12,911,115	8,378,793	8,336,237	9,221,472	9,343,298	9,521,620

Appendix O - In-forest residues by sub-category – Cutover residues – ground-based harvest

Gross supply – in-forests residues, ground-based cutover, m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	153,921	58,495	47,816	98,138	112,335	89,878
Auckland	45,497	27,257	13,696	9,172	3,332	15,585
Waikato	153,532	92,373	59,900	50,936	52,306	49,131
Bay of Plenty	240,900	177,677	141,226	189,611	190,117	173,417
Gisborne	77,526	34,172	15,584	32,407	30,115	32,342
Hawkes Bay	49,554	46,460	32,049	31,864	45,330	84,755
Taranaki	21,064	4,541	1,904	2,087	1,948	6,091
Manawatu-Wanganui	102,118	24,955	9,044	15,719	14,193	19,647
Wellington	18,487	3,823	3,172	2,658	1,962	2,238
Wairarapa	69,627	18,520	6,855	17,737	19,087	28,771
Tasman-Nelson	21,666	15,956	15,535	13,185	10,071	12,711
Marlborough	32,707	8,998	6,867	11,392	13,138	9,478
West Coast	34,990	20,974	26,405	16,472	16,376	17,102
Canterbury	136,494	53,365	21,691	21,278	21,477	22,290
Otago	116,913	51,468	22,421	32,736	35,512	48,031
Southland	125,052	66,215	23,299	33,844	32,209	38,414
NZ Total	1,400,049	705,249	447,463	579,237	599,505	649,879

Gross supply – in-forest residues, ground-based cutover, energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,062,057	403,614	329,928	677,150	775,109	620,156
Auckland	313,928	188,072	94,501	63,290	22,990	107,534
Waikato	1,059,373	637,377	413,313	351,458	360,908	339,003
Bay of Plenty	1,662,207	1,225,969	974,458	1,308,317	1,311,808	1,196,575
Gisborne	534,929	235,788	107,530	223,607	207,792	223,157
Hawkes Bay	341,923	320,576	221,141	219,864	312,775	584,811
Taranaki	145,344	31,336	13,134	14,403	13,441	42,026
Manawatu-Wanganui	704,612	172,187	62,402	108,460	97,931	135,561
Wellington	127,563	26,381	21,889	18,342	13,536	15,440
Wairarapa	480,428	127,786	47,297	122,386	131,699	198,521
Tasman-Nelson	149,495	110,096	107,192	90,980	69,492	87,703
Marlborough	225,681	62,086	47,381	78,607	90,650	65,399
West Coast	241,431	144,721	182,192	113,654	112,997	118,007
Canterbury	941,808	368,219	149,668	146,816	148,188	153,803
Otago	806,701	355,127	154,706	225,878	245,030	331,411
Southland	862,860	456,881	160,761	233,527	222,241	265,057
NZ Total	9,660,339	4,866,215	3,087,494	3,996,738	4,136,587	4,484,163

In-forests residues, ground-based cutover, m³ per annum, recoverability level 1, 70%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	107,745	40,946	33,471	68,696	78,634	62,914
Auckland	31,848	19,080	9,587	6,421	2,332	10,909
Waikato	107,473	64,661	41,930	35,655	36,614	34,392
Bay of Plenty	168,630	124,374	98,858	132,728	133,082	121,392
Gisborne	54,268	23,920	10,909	22,685	21,080	22,639
Hawkes Bay	34,688	32,522	22,435	22,305	31,731	59,329
Taranaki	14,745	3,179	1,332	1,461	1,364	4,263
Manawatu-Wanganui	71,482	17,468	6,331	11,003	9,935	13,753
Wellington	12,941	2,676	2,221	1,861	1,373	1,566
Wairarapa	48,739	12,964	4,798	12,416	13,361	20,140
Tasman-Nelson	15,166	11,169	10,875	9,230	7,050	8,897
Marlborough	22,895	6,299	4,807	7,975	9,196	6,635
West Coast	24,493	14,682	18,483	11,530	11,463	11,972
Canterbury	95,546	37,356	15,184	14,894	15,034	15,603
Otago	81,839	36,027	15,695	22,915	24,858	33,621
Southland	87,537	46,350	16,309	23,691	22,546	26,890
NZ Total	980,034	493,674	313,224	405,466	419,654	454,915

In-forests residues, ground-based cutover, energy (GJ) per annum, recoverability level 1, 70%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	743,440	282,530	230,950	474,005	542,576	434,109
Auckland	219,750	131,650	66,150	44,303	16,093	75,274
Waikato	741,561	446,164	289,319	246,021	252,636	237,302
Bay of Plenty	1,163,545	858,178	682,121	915,822	918,266	837,602
Gisborne	374,450	165,051	75,271	156,525	145,455	156,210
Hawkes Bay	239,346	224,403	154,799	153,905	218,943	409,368
Taranaki	101,741	21,935	9,194	10,082	9,409	29,418
Manawatu-Wanganui	493,228	120,531	43,681	75,922	68,551	94,893
Wellington	89,294	18,467	15,322	12,839	9,475	10,808
Wairarapa	336,300	89,450	33,108	85,670	92,189	138,965
Tasman-Nelson	104,646	77,067	75,034	63,686	48,644	61,392
Marlborough	157,977	43,460	33,166	55,025	63,455	45,779
West Coast	169,002	101,304	127,534	79,557	79,098	82,605
Canterbury	659,266	257,753	104,767	102,771	103,732	107,662
Otago	564,691	248,589	108,294	158,115	171,521	231,988
Southland	604,002	319,816	112,533	163,469	155,569	185,540
NZ Total	6,762,238	3,406,350	2,161,246	2,797,716	2,895,611	3,138,914

In-forests residues, ground-based cutover, m³ per annum, recoverability level 2, 55%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	84,657	32,172	26,299	53,976	61,784	49,433
Auckland	25,023	14,991	7,533	5,045	1,833	8,572
Waikato	84,443	50,805	32,945	28,015	28,768	27,022
Bay of Plenty	132,495	97,722	77,674	104,286	104,564	95,379
Gisborne	42,639	18,795	8,571	17,824	16,563	17,788
Hawkes Bay	27,255	25,553	17,627	17,525	24,931	46,615
Taranaki	11,585	2,498	1,047	1,148	1,071	3,350
Manawatu-Wanganui	56,165	13,725	4,974	8,645	7,806	10,806
Wellington	10,168	2,103	1,745	1,462	1,079	1,231
Wairarapa	38,295	10,186	3,770	9,755	10,498	15,824
Tasman-Nelson	11,916	8,776	8,544	7,252	5,539	6,991
Marlborough	17,989	4,949	3,777	6,266	7,226	5,213
West Coast	19,244	11,536	14,523	9,059	9,007	9,406
Canterbury	75,072	29,351	11,930	11,703	11,812	12,260
Otago	64,302	28,307	12,332	18,005	19,531	26,417
Southland	68,779	36,418	12,814	18,614	17,715	21,128
NZ Total	770,027	387,887	246,105	318,581	329,728	357,433

In-forests residues, ground-based cutover, energy (GJ) per annum, recoverability level 2, 55%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	584,131	221,988	181,461	372,432	426,310	341,086
Auckland	172,660	103,439	51,975	34,809	12,644	59,144
Waikato	582,655	350,557	227,322	193,302	198,500	186,452
Bay of Plenty	914,214	674,283	535,952	719,574	721,495	658,116
Gisborne	294,211	129,683	59,142	122,984	114,286	122,736
Hawkes Bay	188,058	176,317	121,628	120,925	172,026	321,646
Taranaki	79,939	17,235	7,224	7,921	7,393	23,114
Manawatu-Wanganui	387,536	94,703	34,321	59,653	53,862	74,559
Wellington	70,160	14,509	12,039	10,088	7,445	8,492
Wairarapa	264,236	70,282	26,014	67,312	72,434	109,187
Tasman-Nelson	82,222	60,553	58,955	50,039	38,221	48,237
Marlborough	124,124	34,147	26,059	43,234	49,858	35,969
West Coast	132,787	79,596	100,206	62,509	62,148	64,904
Canterbury	517,994	202,521	82,317	80,749	81,504	84,592
Otago	443,686	195,320	85,088	124,233	134,766	182,276
Southland	474,573	251,284	88,419	128,440	122,232	145,781
NZ Total	5,313,187	2,676,418	1,698,121	2,198,206	2,275,123	2,466,290

Appendix P - In-forest residues by sub-category – Cutover residues – hauler / cable harvest

Gross supply – in-forests residues, hauler cutover, m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	25,376	9,124	6,961	14,739	20,102	18,013
Auckland	9,626	5,767	2,898	1,941	705	3,297
Waikato	30,024	17,462	11,281	11,010	11,022	10,050
Bay of Plenty	71,241	63,452	48,887	74,392	66,534	61,223
Gisborne	71,391	31,468	14,351	29,842	27,732	29,782
Hawkes Bay	29,362	25,944	18,256	19,146	26,241	44,738
Taranaki	15,845	3,127	1,266	1,509	1,645	5,398
Manawatu-Wanganui	20,851	4,941	2,001	2,444	2,136	3,317
Wellington	3,552	671	164	110	91	185
Wairarapa	41,416	11,295	4,394	9,788	11,773	18,394
Tasman-Nelson	39,365	28,359	26,788	22,805	18,006	22,348
Marlborough	55,445	15,834	12,330	20,331	23,703	12,141
West Coast	3,384	2,093	2,530	1,814	1,992	1,819
Canterbury	33,929	11,419	5,225	4,926	5,170	5,677
Otago	55,999	25,027	11,672	17,627	17,631	23,671
Southland	13,917	7,080	2,473	3,488	3,341	4,161
NZ Total	520,722	263,062	171,476	235,912	237,824	264,212

Gross supply – in-forests residues, hauler cutover, energy (GJ) per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	175,096	62,956	48,033	101,697	138,706	124,287
Auckland	66,418	39,791	19,994	13,390	4,864	22,751
Waikato	207,168	120,490	77,839	75,972	76,050	69,343
Bay of Plenty	491,560	437,818	337,320	513,308	459,088	422,437
Gisborne	492,595	217,128	99,021	205,911	191,348	205,496
Hawkes Bay	202,598	179,010	125,963	132,110	181,062	308,692
Taranaki	109,332	21,578	8,733	10,412	11,347	37,244
Manawatu-Wanganui	143,869	34,093	13,809	16,862	14,738	22,885
Wellington	24,509	4,629	1,130	756	630	1,274
Wairarapa	285,769	77,938	30,322	67,540	81,235	126,920
Tasman-Nelson	271,621	195,674	184,836	157,353	124,239	154,198
Marlborough	382,568	109,253	85,074	140,284	163,552	83,773
West Coast	23,348	14,445	17,459	12,514	13,743	12,550
Canterbury	234,113	78,788	36,054	33,990	35,675	39,171
Otago	386,391	172,687	80,537	121,626	121,651	163,332
Southland	96,025	48,852	17,062	24,067	23,056	28,712
NZ Total	3,592,978	1,815,130	1,183,186	1,627,792	1,640,983	1,823,065

In-forests residues, hauler cutover, m³ per annum, recoverability level 1, 10%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,538	912	696	1,474	2,010	1,801
Auckland	963	577	290	194	70	330
Waikato	3,002	1,746	1,128	1,101	1,102	1,005
Bay of Plenty	7,124	6,345	4,889	7,439	6,653	6,122
Gisborne	7,139	3,147	1,435	2,984	2,773	2,978
Hawkes Bay	2,936	2,594	1,826	1,915	2,624	4,474
Taranaki	1,585	313	127	151	164	540
Manawatu-Wanganui	2,085	494	200	244	214	332
Wellington	355	67	16	11	9	18
Wairarapa	4,142	1,130	439	979	1,177	1,839
Tasman-Nelson	3,937	2,836	2,679	2,280	1,801	2,235
Marlborough	5,544	1,583	1,233	2,033	2,370	1,214
West Coast	338	209	253	181	199	182
Canterbury	3,393	1,142	523	493	517	568
Otago	5,600	2,503	1,167	1,763	1,763	2,367
Southland	1,392	708	247	349	334	416
NZ Total	52,072	26,306	17,148	23,591	23,782	26,421

In-forests residues, hauler cutover, energy (GJ) per annum, recoverability level 1, 10%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	17,510	6,296	4,803	10,170	13,871	12,429
Auckland	6,642	3,979	1,999	1,339	486	2,275
Waikato	20,717	12,049	7,784	7,597	7,605	6,934
Bay of Plenty	49,156	43,782	33,732	51,331	45,909	42,244
Gisborne	49,260	21,713	9,902	20,591	19,135	20,550
Hawkes Bay	20,260	17,901	12,596	13,211	18,106	30,869
Taranaki	10,933	2,158	873	1,041	1,135	3,724
Manawatu-Wanganui	14,387	3,409	1,381	1,686	1,474	2,289
Wellington	2,451	463	113	76	63	127
Wairarapa	28,577	7,794	3,032	6,754	8,123	12,692
Tasman-Nelson	27,162	19,567	18,484	15,735	12,424	15,420
Marlborough	38,257	10,925	8,507	14,028	16,355	8,377
West Coast	2,335	1,444	1,746	1,251	1,374	1,255
Canterbury	23,411	7,879	3,605	3,399	3,568	3,917
Otago	38,639	17,269	8,054	12,163	12,165	16,333
Southland	9,602	4,885	1,706	2,407	2,306	2,871
NZ Total	359,298	181,513	118,319	162,779	164,098	182,306

In-forests residues, hauler cutover, m³ per annum, recoverability level 2, 5%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	1,269	456	348	737	1,005	901
Auckland	481	288	145	97	35	165
Waikato	1,501	873	564	551	551	502
Bay of Plenty	3,562	3,173	2,444	3,720	3,327	3,061
Gisborne	3,570	1,573	718	1,492	1,387	1,489
Hawkes Bay	1,468	1,297	913	957	1,312	2,237
Taranaki	792	156	63	75	82	270
Manawatu-Wanganui	1,043	247	100	122	107	166
Wellington	178	34	8	5	5	9
Wairarapa	2,071	565	220	489	589	920
Tasman-Nelson	1,968	1,418	1,339	1,140	900	1,117
Marlborough	2,772	792	616	1,017	1,185	607
West Coast	169	105	127	91	100	91
Canterbury	1,696	571	261	246	259	284
Otago	2,800	1,251	584	881	882	1,184
Southland	696	354	124	174	167	208
NZ Total	26,036	13,153	8,574	11,796	11,891	13,211

In-forests residues, hauler cutover, energy (GJ) per annum, recoverability level 2, 5%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	8,755	3,148	2,402	5,085	6,935	6,214
Auckland	3,321	1,990	1,000	670	243	1,138
Waikato	10,358	6,025	3,892	3,799	3,802	3,467
Bay of Plenty	24,578	21,891	16,866	25,665	22,954	21,122
Gisborne	24,630	10,856	4,951	10,296	9,567	10,275
Hawkes Bay	10,130	8,951	6,298	6,605	9,053	15,435
Taranaki	5,467	1,079	437	521	567	1,862
Manawatu-Wanganui	7,193	1,705	690	843	737	1,144
Wellington	1,225	231	57	38	31	64
Wairarapa	14,288	3,897	1,516	3,377	4,062	6,346
Tasman-Nelson	13,581	9,784	9,242	7,868	6,212	7,710
Marlborough	19,128	5,463	4,254	7,014	8,178	4,189
West Coast	1,167	722	873	626	687	627
Canterbury	11,706	3,939	1,803	1,700	1,784	1,959
Otago	19,320	8,634	4,027	6,081	6,083	8,167
Southland	4,801	2,443	853	1,203	1,153	1,436
NZ Total	179,649	90,756	59,159	81,390	82,049	91,153

Appendix Q – Sawmill chip

Sawmill chip is a by-product of the production of sawn lumber and is generally regarded as a by-product not a residue. The sale of chip is a small but important part of a sawmill's income. Typically, this material is sold to other wood processing industries; pulp, paper, MDF, particle board etc. The price is estimated at \$70 per green tonne ex- the sawmill. Some sawmill chip exported, and some is sold for fuel and other uses and so it could be considered as a potential fuel feedstock at the current price.

Gross supply of sawmill chip, green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	103,340	103,340	103,340	103,340	103,340	103,340
Auckland	61,750	61,750	61,750	61,750	61,750	61,750
Waikato	313,020	313,020	313,020	313,020	313,020	313,020
Bay of Plenty	765,240	765,240	765,240	765,240	765,240	765,240
Gisborne	28,420	28,420	28,420	28,420	28,420	28,420
Hawkes Bay	172,080	172,080	172,080	172,080	172,080	172,080
Taranaki	31,170	31,170	31,170	31,170	31,170	31,170
Manawatu-Wanganui	27,170	27,170	27,170	27,170	27,170	27,170
Wellington	-	-	-	-	-	-
Wairarapa	57,650	57,650	57,650	57,650	57,650	57,650
Tasman-Nelson	100,000	100,000	100,000	100,000	100,000	100,000
Marlborough	56,790	56,790	56,790	56,790	56,790	56,790
West Coast	39,700	39,700	39,700	39,700	39,700	39,700
Canterbury	111,815	111,815	111,815	111,815	111,815	111,815
Otago	108,060	108,060	108,060	108,060	108,060	108,060
Southland	286,960	286,960	286,960	286,960	286,960	286,960
NZ Total	2,263,165	2,263,165	2,263,165	2,263,165	2,263,165	2,263,165

Sawmill chip, gross energy (GJ per annum)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	713,046	713,046	713,046	713,046	713,046	713,046
Auckland	426,075	426,075	426,075	426,075	426,075	426,075
Waikato	2,159,838	2,159,838	2,159,838	2,159,838	2,159,838	2,159,838
Bay of Plenty	5,280,156	5,280,156	5,280,156	5,280,156	5,280,156	5,280,156
Gisborne	196,098	196,098	196,098	196,098	196,098	196,098
Hawkes Bay	1,187,352	1,187,352	1,187,352	1,187,352	1,187,352	1,187,352
Taranaki	215,073	215,073	215,073	215,073	215,073	215,073
Manawatu-Wanganui	187,473	187,473	187,473	187,473	187,473	187,473
Wellington	-	-	-	-	-	-
Wairarapa	397,785	397,785	397,785	397,785	397,785	397,785
Tasman-Nelson	690,000	690,000	690,000	690,000	690,000	690,000
Marlborough	391,851	391,851	391,851	391,851	391,851	391,851
West Coast	273,930	273,930	273,930	273,930	273,930	273,930
Canterbury	771,524	771,524	771,524	771,524	771,524	771,524
Otago	745,614	745,614	745,614	745,614	745,614	745,614
Southland	1,980,024	1,980,024	1,980,024	1,980,024	1,980,024	1,980,024
NZ Total	15,615,839	15,615,839	15,615,839	15,615,839	15,615,839	15,615,839

Sawmill chip volume (tonnes per annum) recovery level 1, 75%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	77,505	77,505	77,505	77,505	77,505	77,505
Auckland	46,313	46,313	46,313	46,313	46,313	46,313
Waikato	234,765	234,765	234,765	234,765	234,765	234,765
Bay of Plenty	573,930	573,930	573,930	573,930	573,930	573,930
Gisborne	21,315	21,315	21,315	21,315	21,315	21,315
Hawkes Bay	129,060	129,060	129,060	129,060	129,060	129,060
Taranaki	23,378	23,378	23,378	23,378	23,378	23,378
Manawatu-Wanganui	20,378	20,378	20,378	20,378	20,378	20,378
Wellington	-	-	-	-	-	-
Wairarapa	43,238	43,238	43,238	43,238	43,238	43,238
Tasman-Nelson	75,000	75,000	75,000	75,000	75,000	75,000
Marlborough	42,593	42,593	42,593	42,593	42,593	42,593
West Coast	29,775	29,775	29,775	29,775	29,775	29,775
Canterbury	83,861	83,861	83,861	83,861	83,861	83,861
Otago	81,045	81,045	81,045	81,045	81,045	81,045
Southland	215,220	215,220	215,220	215,220	215,220	215,220
NZ Total	1,697,374	1,697,374	1,697,374	1,697,374	1,697,374	1,697,374

Sawmill chip, energy (GJ per annum) recovery level 1, 75%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	534,785	534,785	534,785	534,785	534,785	534,785
Auckland	319,556	319,556	319,556	319,556	319,556	319,556
Waikato	1,619,879	1,619,879	1,619,879	1,619,879	1,619,879	1,619,879
Bay of Plenty	3,960,117	3,960,117	3,960,117	3,960,117	3,960,117	3,960,117
Gisborne	147,074	147,074	147,074	147,074	147,074	147,074
Hawkes Bay	890,514	890,514	890,514	890,514	890,514	890,514
Taranaki	161,305	161,305	161,305	161,305	161,305	161,305
Manawatu-Wanganui	140,605	140,605	140,605	140,605	140,605	140,605
Wellington	-	-	-	-	-	-
Wairarapa	298,339	298,339	298,339	298,339	298,339	298,339
Tasman-Nelson	517,500	517,500	517,500	517,500	517,500	517,500
Marlborough	293,888	293,888	293,888	293,888	293,888	293,888
West Coast	205,448	205,448	205,448	205,448	205,448	205,448
Canterbury	578,643	578,643	578,643	578,643	578,643	578,643
Otago	559,211	559,211	559,211	559,211	559,211	559,211
Southland	1,485,018	1,485,018	1,485,018	1,485,018	1,485,018	1,485,018
NZ Total	11,711,879	11,711,879	11,711,879	11,711,879	11,711,879	11,711,879

Sawmill chip volume (tonnes per annum) recovery level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	51,670	51,670	51,670	51,670	51,670	51,670
Auckland	30,875	30,875	30,875	30,875	30,875	30,875
Waikato	156,510	156,510	156,510	156,510	156,510	156,510
Bay of Plenty	382,620	382,620	382,620	382,620	382,620	382,620
Gisborne	14,210	14,210	14,210	14,210	14,210	14,210
Hawkes Bay	86,040	86,040	86,040	86,040	86,040	86,040
Taranaki	15,585	15,585	15,585	15,585	15,585	15,585
Manawatu-Wanganui	13,585	13,585	13,585	13,585	13,585	13,585
Wellington	-	-	-	-	-	-
Wairarapa	28,825	28,825	28,825	28,825	28,825	28,825
Tasman-Nelson	50,000	50,000	50,000	50,000	50,000	50,000
Marlborough	28,395	28,395	28,395	28,395	28,395	28,395
West Coast	19,850	19,850	19,850	19,850	19,850	19,850
Canterbury	55,908	55,908	55,908	55,908	55,908	55,908
Otago	54,030	54,030	54,030	54,030	54,030	54,030
Southland	143,480	143,480	143,480	143,480	143,480	143,480
NZ Total	1,131,583	1,131,583	1,131,583	1,131,583	1,131,583	1,131,583

Sawmill chip, energy (GJ per annum) recovery level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	356,523	356,523	356,523	356,523	356,523	356,523
Auckland	213,038	213,038	213,038	213,038	213,038	213,038
Waikato	1,079,919	1,079,919	1,079,919	1,079,919	1,079,919	1,079,919
Bay of Plenty	2,640,078	2,640,078	2,640,078	2,640,078	2,640,078	2,640,078
Gisborne	98,049	98,049	98,049	98,049	98,049	98,049
Hawkes Bay	593,676	593,676	593,676	593,676	593,676	593,676
Taranaki	107,537	107,537	107,537	107,537	107,537	107,537
Manawatu-Wanganui	93,737	93,737	93,737	93,737	93,737	93,737
Wellington	-	-	-	-	-	-
Wairarapa	198,893	198,893	198,893	198,893	198,893	198,893
Tasman-Nelson	345,000	345,000	345,000	345,000	345,000	345,000
Marlborough	195,926	195,926	195,926	195,926	195,926	195,926
West Coast	136,965	136,965	136,965	136,965	136,965	136,965
Canterbury	385,762	385,762	385,762	385,762	385,762	385,762
Otago	372,807	372,807	372,807	372,807	372,807	372,807
Southland	990,012	990,012	990,012	990,012	990,012	990,012
NZ Total	7,807,919	7,807,919	7,807,919	7,807,919	7,807,919	7,807,919

Appendix R – K grade logs

Note: K grade in this context includes all the variations of K grade, including KI, KS and KIS grades

Gross supply of K grade logs, green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	795,480	689,032	1,002,585	1,187,436	1,208,004	1,129,600
Auckland	312,718	190,968	107,042	95,948	216,507	349,350
Waikato	944,426	771,691	547,686	437,577	630,572	913,416
Bay of Plenty	1,869,590	1,808,985	2,018,593	2,064,806	1,973,607	1,987,999
Gisborne	629,627	384,001	436,018	491,910	667,501	857,234
Hawkes Bay	720,861	580,359	596,550	842,702	1,032,321	926,671
Taranaki	101,434	30,133	20,870	44,635	129,029	176,565
Manawatu-Wanganui	288,211	111,285	87,509	91,168	245,132	418,400
Wellington	45,619	11,786	4,243	5,059	34,770	67,788
Wairarapa	386,126	180,599	223,713	326,491	533,169	635,918
Tasman-Nelson	479,611	460,531	402,022	358,617	398,255	460,740
Marlborough	360,593	244,903	313,383	333,316	395,313	491,071
West Coast	40,176	44,258	44,514	44,235	42,978	39,176
Canterbury	361,437	171,691	156,716	175,691	332,699	503,470
Otago	578,718	360,161	376,627	499,490	705,830	801,525
Southland	378,177	221,780	200,341	246,102	366,934	477,569
NZ Total	8,292,805	6,262,163	6,538,413	7,245,184	8,912,620	10,236,491

K grade logs, gross energy (GJ per annum)

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	5,488,815	4,754,320	6,917,834	8,193,311	8,335,226	7,794,243
Auckland	2,157,753	1,317,682	738,588	662,044	1,493,901	2,410,517
Waikato	6,516,542	5,324,671	3,779,032	3,019,281	4,350,946	6,302,567
Bay of Plenty	12,900,169	12,481,996	13,928,295	14,247,163	13,617,888	13,717,192
Gisborne	4,344,425	2,649,609	3,008,525	3,394,182	4,605,755	5,914,914
Hawkes Bay	4,973,942	4,004,475	4,116,196	5,814,646	7,123,012	6,394,030
Taranaki	699,894	207,917	144,000	307,979	890,298	1,218,296
Manawatu-Wanganui	1,988,655	767,865	603,815	629,062	1,691,414	2,886,958
Wellington	314,773	81,325	29,280	34,909	239,916	467,735
Wairarapa	2,664,268	1,246,131	1,543,622	2,252,789	3,678,866	4,387,836
Tasman-Nelson	3,309,319	3,177,666	2,773,952	2,474,455	2,747,957	3,179,107
Marlborough	2,488,094	1,689,830	2,162,346	2,299,879	2,727,658	3,388,388
West Coast	277,217	305,383	307,148	305,220	296,549	270,312
Canterbury	2,493,913	1,184,666	1,081,341	1,212,269	2,295,624	3,473,944
Otago	3,993,155	2,485,108	2,598,724	3,446,478	4,870,228	5,530,521
Southland	2,609,418	1,530,282	1,382,351	1,698,106	2,531,843	3,295,224
NZ Total	57,220,352	43,208,925	45,115,048	49,991,771	61,497,081	70,631,785

K grade logs volume (tonnes per annum) recovery level 1, 95%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	755,706	654,580	952,455	1,128,065	1,147,604	1,073,120
Auckland	297,082	181,420	101,690	91,151	205,682	331,883
Waikato	897,205	733,107	520,301	415,698	599,043	867,745
Bay of Plenty	1,776,110	1,718,536	1,917,664	1,961,566	1,874,927	1,888,599
Gisborne	598,145	364,801	414,217	467,315	634,126	814,372
Hawkes Bay	684,818	551,341	566,723	800,567	980,705	880,337
Taranaki	96,362	28,626	19,826	42,403	122,577	167,736
Manawatu-Wanganui	273,800	105,721	83,134	86,610	232,876	397,480
Wellington	43,338	11,197	4,031	4,806	33,032	64,398
Wairarapa	366,820	171,569	212,528	310,167	506,510	604,122
Tasman-Nelson	455,631	437,505	381,921	340,686	378,342	437,703
Marlborough	342,564	232,658	297,714	316,650	375,547	466,517
West Coast	38,168	42,045	42,289	42,023	40,829	37,217
Canterbury	343,365	163,106	148,880	166,907	316,064	478,297
Otago	549,782	342,153	357,795	474,515	670,539	761,449
Southland	359,268	210,691	190,324	233,797	348,587	453,690
NZ Total	7,878,164	5,949,055	6,211,492	6,882,925	8,466,989	9,724,666

K grade logs, energy (GJ per annum) recovery level 1, 95%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	5,214,374	4,516,604	6,571,942	7,783,646	7,918,464	7,404,531
Auckland	2,049,866	1,251,798	701,659	628,942	1,419,206	2,289,991
Waikato	6,190,715	5,058,438	3,590,080	2,868,317	4,133,398	5,987,439
Bay of Plenty	12,255,160	11,857,896	13,231,880	13,534,805	12,936,993	13,031,333
Gisborne	4,127,204	2,517,128	2,858,099	3,224,473	4,375,467	5,619,169
Hawkes Bay	4,725,245	3,804,251	3,910,386	5,523,913	6,766,861	6,074,328
Taranaki	664,899	197,521	136,800	292,580	845,783	1,157,381
Manawatu-Wanganui	1,889,222	729,472	573,625	597,608	1,606,843	2,742,610
Wellington	299,035	77,259	27,816	33,163	227,921	444,348
Wairarapa	2,531,055	1,183,824	1,466,440	2,140,149	3,494,922	4,168,444
Tasman-Nelson	3,143,853	3,018,783	2,635,254	2,350,732	2,610,560	3,020,152
Marlborough	2,363,689	1,605,338	2,054,228	2,184,885	2,591,275	3,218,969
West Coast	263,356	290,114	291,791	289,959	281,722	256,796
Canterbury	2,369,217	1,125,432	1,027,274	1,151,655	2,180,843	3,300,247
Otago	3,793,497	2,360,853	2,468,788	3,274,154	4,626,716	5,253,995
Southland	2,478,947	1,453,768	1,313,233	1,613,200	2,405,251	3,130,463
NZ Total	54,359,334	41,048,479	42,859,296	47,492,183	58,422,227	67,100,195

K grade logs volume (tonnes per annum) recovery level 2, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	636,384	551,225	802,068	949,949	966,403	903,680
Auckland	250,174	152,775	85,633	76,759	173,206	279,480
Waikato	755,541	617,353	438,149	350,062	504,457	730,732
Bay of Plenty	1,495,672	1,447,188	1,614,875	1,651,845	1,578,886	1,590,399
Gisborne	503,701	307,201	348,814	393,528	534,001	685,787
Hawkes Bay	576,689	464,287	477,240	674,162	825,856	741,337
Taranaki	81,147	24,106	16,696	35,708	103,223	141,252
Manawatu-Wanganui	230,569	89,028	70,008	72,935	196,106	334,720
Wellington	36,495	9,429	3,395	4,047	27,816	54,230
Wairarapa	308,901	144,479	178,971	261,193	426,535	508,735
Tasman-Nelson	383,689	368,425	321,618	286,893	318,604	368,592
Marlborough	288,475	195,922	250,707	266,653	316,250	392,857
West Coast	32,141	35,407	35,611	35,388	34,383	31,341
Canterbury	289,149	137,353	125,373	140,553	266,159	402,776
Otago	462,975	288,128	301,301	399,592	564,664	641,220
Southland	302,541	177,424	160,273	196,882	293,547	382,055
NZ Total	6,634,244	5,009,730	5,230,730	5,796,147	7,130,096	8,189,192

K grade logs, energy (GJ per annum) recovery level 2, 80%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	4,391,052	3,803,456	5,534,267	6,554,649	6,668,180	6,235,394
Auckland	1,726,203	1,054,146	590,871	529,635	1,195,121	1,928,413
Waikato	5,213,234	4,259,737	3,023,225	2,415,425	3,480,756	5,042,054
Bay of Plenty	10,320,135	9,985,597	11,142,636	11,397,730	10,894,310	10,973,754
Gisborne	3,475,540	2,119,687	2,406,820	2,715,345	3,684,604	4,731,932
Hawkes Bay	3,979,154	3,203,580	3,292,957	4,651,717	5,698,410	5,115,224
Taranaki	559,915	166,333	115,200	246,383	712,238	974,637
Manawatu-Wanganui	1,590,924	614,292	483,052	503,249	1,353,131	2,309,566
Wellington	251,819	65,060	23,424	27,927	191,933	374,188
Wairarapa	2,131,415	996,905	1,234,897	1,802,231	2,943,092	3,510,268
Tasman-Nelson	2,647,455	2,542,133	2,219,161	1,979,564	2,198,366	2,543,286
Marlborough	1,990,475	1,351,864	1,729,876	1,839,903	2,182,126	2,710,711
West Coast	221,774	244,306	245,719	244,176	237,240	216,250
Canterbury	1,995,130	947,733	865,073	969,815	1,836,500	2,779,155
Otago	3,194,524	1,988,087	2,078,979	2,757,182	3,896,182	4,424,417
Southland	2,087,534	1,224,226	1,105,881	1,358,485	2,025,474	2,636,179
NZ Total	45,776,281	34,567,140	36,092,039	39,993,417	49,197,665	56,505,428

Appendix S – Douglas-fir production thinnings

Gross supply of Douglas-fir production thinnings, green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	40	0
Auckland	0	0	120	0
Waikato	5,580	5,280	1,300	40
Bay of Plenty	44,400	44,720	52,460	45,020
Gisborne	10,380	7,600	20	20
Hawkes Bay	1,260	2,780	500	200
Taranaki	40	0	0	0
Manawatu-Wanganui	960	1,680	240	380
Wairarapa	640	640	80	20
Wellington	160	120	20	60
Tasman-Nelson	12,600	30,360	23,220	22,320
Marlborough	640	10,340	760	5,520
West Coast	8,820	1,460	160	40
Canterbury	102,700	98,340	19,420	16,112
Otago	166,320	200,300	23,800	39,430
Southland	193,240	184,540	5,040	6,120
NZ Total	547,740	588,140	127,180	135,622

Douglas-fir production thinnings, gross energy (GJ per annum)

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	276	0
Auckland	0	0	828	0
Waikato	38,502	36,432	8,970	276
Bay of Plenty	306,360	308,568	361,974	310,638
Gisborne	71,622	52,440	138	138
Hawkes Bay	8,694	19,182	3,450	1,380
Taranaki	276	0	0	0
Manawatu-Wanganui	6,624	11,592	1,656	2,622
Wairarapa	4,416	4,416	552	138
Wellington	1,104	828	138	414
Tasman-Nelson	86,940	209,484	160,218	154,008
Marlborough	4,416	71,346	5,244	38,088
West Coast	60,858	10,074	1,104	276
Canterbury	708,630	678,546	133,998	111,173
Otago	1,147,608	1,382,070	164,220	272,067
Southland	1,333,356	1,273,326	34,776	42,228
NZ Total	3,779,406	4,058,166	877,542	935,792

Douglas-fir production thinnings volume (tonnes per annum) recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	32	0
Auckland	0	0	96	0
Waikato	4,464	4,224	1,040	32
Bay of Plenty	35,520	35,776	41,968	36,016
Gisborne	8,304	6,080	16	16
Hawkes Bay	1,008	2,224	400	160
Taranaki	32	0	0	0
Manawatu-Wanganui	768	1,344	192	304
Wairarapa	512	512	64	16
Wellington	128	96	16	48
Tasman-Nelson	10,080	24,288	18,576	17,856
Marlborough	512	8,272	608	4,416
West Coast	7,056	1,168	128	32
Canterbury	82,160	78,672	15,536	12,890
Otago	133,056	160,240	19,040	31,544
Southland	154,592	147,632	4,032	4,896
NZ Total	438,192	470,512	101,744	108,498

Douglas-fir production thinnings, energy (GJ per annum) recovery level 1, 80%

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	221	0
Auckland	0	0	662	0
Waikato	30,802	29,146	7,176	221
Bay of Plenty	245,088	246,854	289,579	248,510
Gisborne	57,298	41,952	110	110
Hawkes Bay	6,955	15,346	2,760	1,104
Taranaki	221	0	0	0
Manawatu-Wanganui	5,299	9,274	1,325	2,098
Wairarapa	3,533	3,533	442	110
Wellington	883	662	110	331
Tasman-Nelson	69,552	167,587	128,174	123,206
Marlborough	3,533	57,077	4,195	30,470
West Coast	48,686	8,059	883	221
Canterbury	566,904	542,837	107,198	88,938
Otago	918,086	1,105,656	131,376	217,654
Southland	1,066,685	1,018,661	27,821	33,782
NZ Total	3,023,525	3,246,533	702,034	748,633

Douglas-fir production thinnings volume (tonnes per annum) recovery level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	20	0
Auckland	0	0	60	0
Waikato	2,790	2,640	650	20
Bay of Plenty	22,200	22,360	26,230	22,510
Gisborne	5,190	3,800	10	10
Hawkes Bay	630	1,390	250	100
Taranaki	20	0	0	0
Manawatu-Wanganui	480	840	120	190
Wairarapa	320	320	40	10
Wellington	80	60	10	30
Tasman-Nelson	6,300	15,180	11,610	11,160
Marlborough	320	5,170	380	2,760
West Coast	4,410	730	80	20
Canterbury	51,350	49,170	9,710	8,056
Otago	83,160	100,150	11,900	19,715
Southland	96,620	92,270	2,520	3,060
NZ Total	273,870	294,070	63,590	67,811

Douglas-fir production thinnings, energy (GJ per annum) recovery level 2, 50%

	2026-2030	2031-2035	2036-2040	2041-2045
Northland	0	0	138	0
Auckland	0	0	414	0
Waikato	19,251	18,216	4,485	138
Bay of Plenty	153,180	154,284	180,987	155,319
Gisborne	35,811	26,220	69	69
Hawkes Bay	4,347	9,591	1,725	690
Taranaki	138	0	0	0
Manawatu-Wanganui	3,312	5,796	828	1,311
Wairarapa	2,208	2,208	276	69
Wellington	552	414	69	207
Tasman-Nelson	43,470	104,742	80,109	77,004
Marlborough	2,208	35,673	2,622	19,044
West Coast	30,429	5,037	552	138
Canterbury	354,315	339,273	66,999	55,586
Otago	573,804	691,035	82,110	136,034
Southland	666,678	636,663	17,388	21,114
NZ Total	1,889,703	2,029,083	438,771	467,896

Appendix T – A grade logs

Gross supply of A grade logs, m³ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	769,131	823,691	518,215	713,760	1,050,183	1,032,054
Auckland	297,265	281,991	166,447	124,718	67,835	101,028
Waikato	1,138,438	1,071,770	721,738	558,000	569,033	601,025
Bay of Plenty	2,041,060	2,527,941	2,252,243	2,461,087	2,749,859	2,575,879
Gisborne	862,249	803,933	418,828	487,241	619,645	585,358
Hawkes Bay	519,267	694,503	600,854	506,403	662,542	987,865
Taranaki	143,874	97,280	43,719	21,748	23,128	67,669
Manawatu-Wanganui	592,345	388,085	170,883	152,654	183,967	216,423
Wellington	56,466	35,158	16,387	5,584	3,737	6,533
Wairarapa	341,357	306,033	139,264	138,268	202,299	255,842
Tasman / Nelson	465,384	588,517	539,589	468,441	384,696	378,297
Marlborough	464,860	364,783	253,232	285,265	385,977	325,441
West Coast	27,395	53,417	60,069	45,177	42,300	43,550
Canterbury	351,595	262,571	132,376	117,908	135,425	144,238
Otago	463,316	450,745	264,875	240,656	316,800	429,104
Southland	280,981	253,749	153,594	138,085	163,212	189,902
Total	8,814,985	9,004,167	6,452,314	6,464,998	7,560,638	7,940,210

Gross supply of energy from A grade logs, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060
Northland	5,307,003	5,683,466	3,575,684	4,924,947	7,246,263	7,121,170	7,121,170
Auckland	2,051,130	1,945,739	1,148,485	860,554	468,062	697,092	697,092
Waikato	7,855,222	7,395,212	4,979,992	3,850,202	3,926,326	4,147,070	4,147,070
Bay of Plenty	14,083,315	17,442,793	15,540,474	16,981,503	18,974,028	17,773,568	17,773,568
Gisborne	5,949,520	5,547,139	2,889,911	3,361,960	4,275,551	4,038,973	4,038,973
Hawkes Bay	3,582,944	4,792,069	4,145,894	3,494,183	4,571,542	6,816,270	6,816,270
Taranaki	992,728	671,230	301,663	150,060	159,580	466,920	466,920
Manawatu-Wanganui	4,087,178	2,677,789	1,179,096	1,053,313	1,269,373	1,493,321	1,493,321
Wellington	389,618	242,593	113,070	38,531	25,788	45,078	45,078
Wairarapa	2,355,361	2,111,629	960,918	954,047	1,395,861	1,765,310	1,765,310
Tasman / Nelson	3,211,152	4,060,765	3,723,163	3,232,245	2,654,403	2,610,250	2,610,250
Marlborough	3,207,535	2,517,003	1,747,303	1,968,332	2,663,245	2,245,546	2,245,546
West Coast	189,025	368,578	414,478	311,722	291,869	300,496	300,496
Canterbury	2,426,009	1,811,738	913,392	813,567	934,432	995,241	995,241
Otago	3,196,884	3,110,140	1,827,640	1,660,529	2,185,919	2,960,818	2,960,818
Southland	1,938,771	1,750,867	1,059,801	952,789	1,126,162	1,310,327	1,310,327
Total	60,823,394	62,128,749	44,520,965	44,608,484	52,168,404	54,787,449	54,787,449

A grade logs – m³ per annum, recoverability level 1; 90%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	692,218	741,322	466,394	642,384	945,165	928,848
Auckland	267,539	253,792	149,802	112,246	61,052	90,925
Waikato	1,024,594	964,593	649,564	502,200	512,129	540,922
Bay of Plenty	1,836,954	2,275,147	2,027,018	2,214,979	2,474,873	2,318,291
Gisborne	776,024	723,540	376,945	438,517	557,681	526,823
Hawkes Bay	467,341	625,052	540,769	455,763	596,288	889,079
Taranaki	129,486	87,552	39,347	19,573	20,815	60,903
Manawatu-Wanganui	533,110	349,277	153,795	137,389	165,570	194,781
Wellington	50,820	31,643	14,748	5,026	3,364	5,880
Wairarapa	307,221	275,430	125,337	124,441	182,069	230,258
Tasman / Nelson	418,846	529,665	485,630	421,597	346,226	340,467
Marlborough	418,374	328,305	227,909	256,739	347,380	292,897
West Coast	24,655	48,075	54,062	40,659	38,070	39,195
Canterbury	316,436	236,314	119,138	106,117	121,882	129,814
Otago	416,985	405,670	238,388	216,591	285,120	386,194
Southland	252,883	228,374	138,235	124,277	146,891	170,912
Total	7,933,486	8,103,750	5,807,082	5,818,498	6,804,574	7,146,189

A grade logs – energy available, GJ per annum recoverability level 1, 90%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	4,776,303	5,115,120	3,218,116	4,432,452	6,521,637	6,409,053
Auckland	1,846,017	1,751,165	1,033,637	774,498	421,256	627,383
Waikato	7,069,700	6,655,690	4,481,993	3,465,182	3,533,693	3,732,363
Bay of Plenty	12,674,984	15,698,514	13,986,427	15,283,353	17,076,625	15,996,211
Gisborne	5,354,568	4,992,425	2,600,920	3,025,764	3,847,996	3,635,076
Hawkes Bay	3,224,650	4,312,862	3,731,305	3,144,765	4,114,388	6,134,643
Taranaki	893,455	604,107	271,496	135,054	143,622	420,228
Manawatu-Wanganui	3,678,460	2,410,010	1,061,186	947,982	1,142,436	1,343,989
Wellington	350,656	218,334	101,763	34,678	23,209	40,571
Wairarapa	2,119,825	1,900,466	864,827	858,643	1,256,275	1,588,779
Tasman / Nelson	2,890,037	3,654,688	3,350,847	2,909,020	2,388,962	2,349,225
Marlborough	2,886,782	2,265,303	1,572,573	1,771,499	2,396,920	2,020,991
West Coast	170,122	331,720	373,030	280,550	262,682	270,446
Canterbury	2,183,408	1,630,564	822,053	732,211	840,989	895,717
Otago	2,877,195	2,799,126	1,644,876	1,494,476	1,967,328	2,664,736
Southland	1,744,894	1,575,780	953,820	857,510	1,013,546	1,179,294
Total	54,741,055	55,915,874	40,068,869	40,147,636	46,951,563	49,308,704

A grade logs – m³ per annum, recoverability level 2; 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	384,565	411,845	259,108	356,880	525,092	516,027
Auckland	148,633	140,996	83,224	62,359	33,918	50,514
Waikato	569,219	535,885	360,869	279,000	284,516	300,512
Bay of Plenty	1,020,530	1,263,971	1,126,121	1,230,544	1,374,930	1,287,940
Gisborne	431,125	401,967	209,414	243,620	309,823	292,679
Hawkes Bay	259,634	347,251	300,427	253,202	331,271	493,933
Taranaki	71,937	48,640	21,860	10,874	11,564	33,835
Manawatu-Wanganui	296,172	194,043	85,442	76,327	91,984	108,212
Wellington	28,233	17,579	8,193	2,792	1,869	3,267
Wairarapa	170,678	153,017	69,632	69,134	101,149	127,921
Tasman / Nelson	232,692	294,258	269,794	234,221	192,348	189,149
Marlborough	232,430	182,392	126,616	142,633	192,989	162,721
West Coast	13,697	26,709	30,035	22,589	21,150	21,775
Canterbury	175,798	131,285	66,188	58,954	67,712	72,119
Otago	231,658	225,372	132,438	120,328	158,400	214,552
Southland	140,491	126,874	76,797	69,043	81,606	94,951
Total	4,407,492	4,502,083	3,226,157	3,232,499	3,780,319	3,970,105

A grade logs – GJ per annum, recoverability level 1; 50%

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	2,388,151	2,557,560	1,609,058	2,216,226	3,260,818	3,204,527
Auckland	923,008	875,583	516,818	387,249	210,628	313,692
Waikato	3,534,850	3,327,845	2,240,997	1,732,591	1,766,847	1,866,181
Bay of Plenty	6,337,492	7,849,257	6,993,213	7,641,676	8,538,312	7,998,106
Gisborne	2,677,284	2,496,212	1,300,460	1,512,882	1,923,998	1,817,538
Hawkes Bay	1,612,325	2,156,431	1,865,652	1,572,382	2,057,194	3,067,322
Taranaki	446,727	302,054	135,748	67,527	71,811	210,114
Manawatu-Wanganui	1,839,230	1,205,005	530,593	473,991	571,218	671,994
Wellington	175,328	109,167	50,881	17,339	11,605	20,285
Wairarapa	1,059,912	950,233	432,413	429,321	628,137	794,389
Tasman / Nelson	1,445,018	1,827,344	1,675,423	1,454,510	1,194,481	1,174,613
Marlborough	1,443,391	1,132,651	786,286	885,749	1,198,460	1,010,496
West Coast	85,061	165,860	186,515	140,275	131,341	135,223
Canterbury	1,091,704	815,282	411,027	366,105	420,495	447,858
Otago	1,438,598	1,399,563	822,438	747,238	983,664	1,332,368
Southland	872,447	787,890	476,910	428,755	506,773	589,647
Total	27,370,527	27,957,937	20,034,434	20,073,818	23,475,782	24,654,352

Appendix V – Stumps

Gross volume – green tonnes per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	47,914	18,209	14,884	30,549	34,968	27,978
Auckland	14,163	8,485	4,263	2,855	1,037	4,851
Waikato	47,793	28,755	18,646	15,856	16,282	15,294
Bay of Plenty	74,989	55,309	43,962	59,024	59,181	53,983
Gisborne	24,133	10,637	4,851	10,088	9,374	10,068
Hawkes Bay	15,426	14,463	9,977	9,919	14,111	26,383
Taranaki	6,557	1,414	593	650	606	1,896
Manawatu-Wanganui	30,109	7,244	2,745	4,853	4,301	6,064
Wairarapa	15,835	4,683	1,758	3,837	4,326	5,628
Wellington	4,218	1,020	214	81	124	292
Tasman / Nelson	6,744	4,967	4,836	4,104	3,135	3,957
Marlborough	10,181	2,801	2,138	3,546	4,090	2,950
West Coast	10,892	6,529	8,219	5,127	5,098	5,324
Canterbury	42,489	16,612	6,752	6,623	6,685	6,939
Otago	36,394	16,021	6,979	10,190	11,054	14,951
Southland	38,927	20,612	7,253	10,535	10,026	11,958
Total volume	426,764	217,760	138,071	177,840	184,399	198,515

Gross energy – GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	905,573	344,145	281,317	577,379	660,904	528,782
Auckland	267,674	160,361	80,577	53,965	19,603	91,690
Waikato	903,285	543,466	352,415	299,674	307,732	289,054
Bay of Plenty	1,417,297	1,045,335	830,882	1,115,550	1,118,526	1,020,271
Gisborne	456,113	201,047	91,687	190,661	177,176	190,277
Hawkes Bay	291,544	273,343	188,559	187,470	266,691	498,645
Taranaki	123,929	26,719	11,199	12,281	11,461	35,834
Manawatu-Wanganui	569,057	136,919	51,887	91,722	81,282	114,601
Wairarapa	299,276	88,514	33,232	72,526	81,765	106,378
Wellington	79,718	19,270	4,043	1,534	2,337	5,518
Tasman / Nelson	127,468	93,874	91,398	77,575	59,253	74,781
Marlborough	192,429	52,939	40,399	67,025	77,294	55,763
West Coast	205,858	123,397	155,348	96,908	96,348	100,620
Canterbury	803,042	313,966	127,616	125,184	126,354	131,142
Otago	687,842	302,803	131,912	192,597	208,927	282,581
Southland	735,727	389,564	137,075	199,119	189,496	226,003
Total volume	8,065,832	4,115,661	2,609,544	3,361,169	3,485,149	3,751,941

Estimated recoverable volume, green tonnes per annum – 50% of gross

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	23,957	9,104	7,442	15,275	17,484	13,989
Auckland	7,081	4,242	2,132	1,428	519	2,426
Waikato	23,896	14,377	9,323	7,928	8,141	7,647
Bay of Plenty	37,495	27,654	21,981	29,512	29,591	26,991
Gisborne	12,066	5,319	2,426	5,044	4,687	5,034
Hawkes Bay	7,713	7,231	4,988	4,960	7,055	13,192
Taranaki	3,279	707	296	325	303	948
Manawatu-Wanganui	15,054	3,622	1,373	2,427	2,150	3,032
Wairarapa	7,917	2,342	879	1,919	2,163	2,814
Wellington	2,109	510	107	41	62	146
Tasman / Nelson	3,372	2,483	2,418	2,052	1,568	1,978
Marlborough	5,091	1,400	1,069	1,773	2,045	1,475
West Coast	5,446	3,264	4,110	2,564	2,549	2,662
Canterbury	21,244	8,306	3,376	3,312	3,343	3,469
Otago	18,197	8,011	3,490	5,095	5,527	7,476
Southland	19,464	10,306	3,626	5,268	5,013	5,979
Total volume	213,382	108,880	69,036	88,920	92,200	99,258

Estimated recoverable energy, GJ per annum

	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055
Northland	452,787	172,073	140,658	288,689	330,452	264,391
Auckland	133,837	80,181	40,288	26,982	9,801	45,845
Waikato	451,642	271,733	176,208	149,837	153,866	144,527
Bay of Plenty	708,649	522,667	415,441	557,775	559,263	510,136
Gisborne	228,056	100,523	45,843	95,330	88,588	95,138
Hawkes Bay	145,772	136,671	94,279	93,735	133,345	249,323
Taranaki	61,965	13,359	5,600	6,140	5,730	17,917
Manawatu-Wanganui	284,528	68,460	25,943	45,861	40,641	57,301
Wairarapa	149,638	44,257	16,616	36,263	40,882	53,189
Wellington	39,859	9,635	2,022	767	1,168	2,759
Tasman / Nelson	63,734	46,937	45,699	38,787	29,626	37,391
Marlborough	96,215	26,469	20,200	33,512	38,647	27,881
West Coast	102,929	61,699	77,674	48,454	48,174	50,310
Canterbury	401,521	156,983	63,808	62,592	63,177	65,571
Otago	343,921	151,401	65,956	96,299	104,464	141,290
Southland	367,863	194,782	68,537	99,560	94,748	113,002
Total volume	4,032,916	2,057,830	1,304,772	1,680,584	1,742,575	1,875,971

Appendix W – Wildings (Canterbury only)

Wildings - area, volume and energy content in Canterbury by district

	Area, ha	Volume, m ³	Mean Volume, m ³ per ha	GJ	MWh	Boiler capacity for 1 year at 65% loading
Hurunui District	301	21,337	71	147,222	40,895	7.18
Kaikoura District	8	1,169	142	8,064	2,240	0.39
Mackenzie District	1,636	36,646	22	252,855	70,237	12.34
Selwyn District	140	3,282	24	22,644	6,290	1.10
Timaru District	12	268	22	1,846	513	0.09
Waimate District	2	204	126	1,409	391	0.07
Waitaki District	41	3,304	81	22,796	6,332	1.11
Canterbury Region	2,139	66,208	31	456,835	126,899	22.29

Note – this volume is assumed to be a one off cut of a non-replacing resource.

Appendix X – National level cost supply curve (\$'s per tonne and tonnage per annum)

