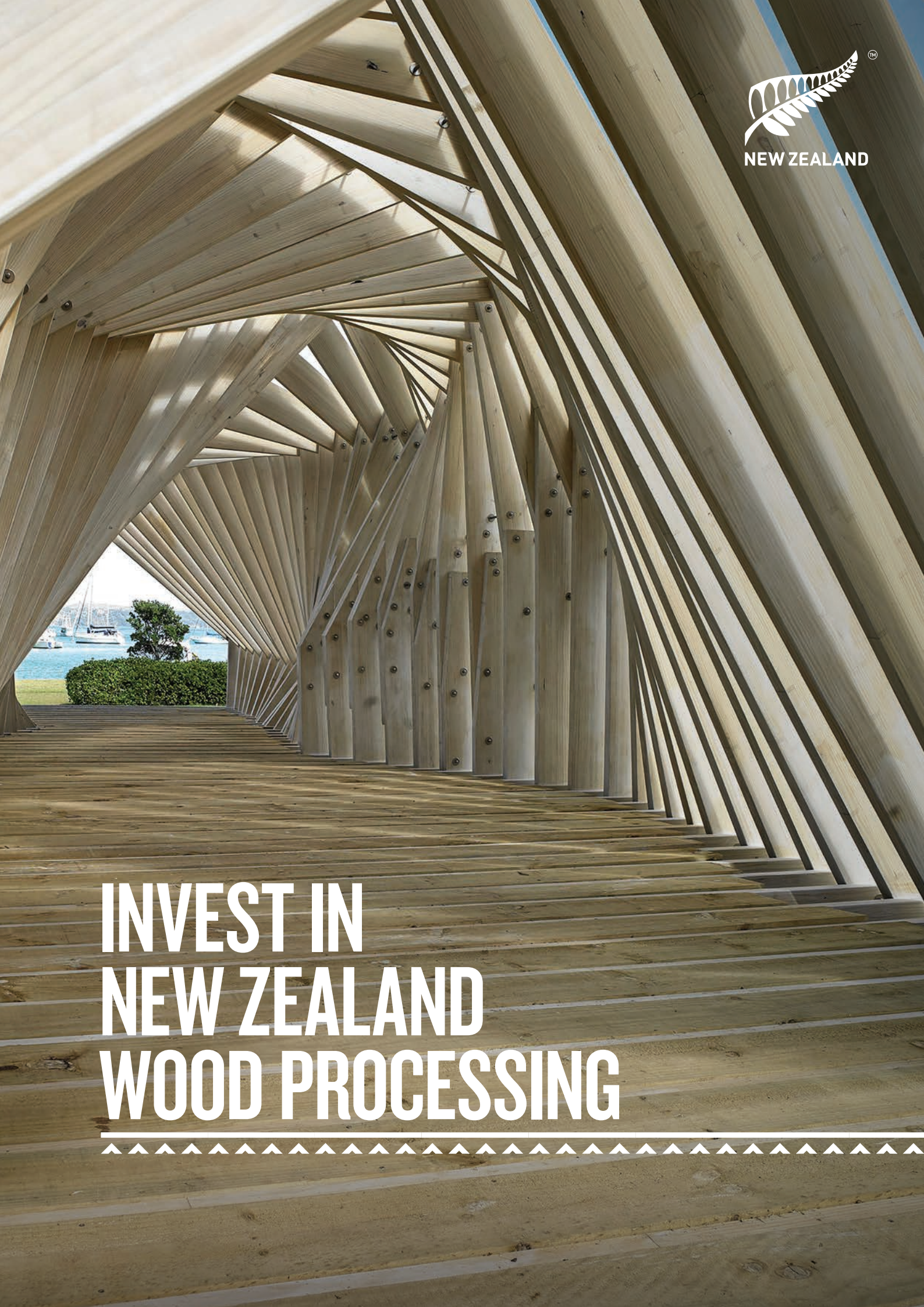


NEW ZEALAND

INVEST IN NEW ZEALAND WOOD PROCESSING

CONTENTS

Image source: DCA Architects of Transformation

Image source: Treehouse Restaurant, Timberlab.co.nz

FOREWORD

The New Zealand Government welcomes international investors.

New Zealand is a highly competitive, export-driven economy with positive economic growth. For the last six years, our economic growth has been consistently above the Organisation for Economic Cooperation and Development (OECD) average[1].

We have an abundance of natural resources, a clear regulatory framework, and access to growing markets around the world. Our progressive nation and growing economy is built on a fierce appreciation of the land that inspires us, and our desire to deliver sustainable solutions for future generations.

Our success is grounded in our values and there is an opportunity to build businesses that are not just good for New Zealand, but are good for the world. Opportunities exist for investors aligned with our values to partner with, and develop, long-term business relationships with sector participants. International investment in areas that create new productive assets is the kind of investment we are eager to attract.

The wood sector provides a significant contribution to the economy and environment and has a key role in building community resilience. We are committed to building a strong, vibrant and stable wood sector, supporting Māori aspirations (Māori are the indigenous people of New Zealand) and transitioning to a zero-carbon economy, as well as supporting our communities to flourish.

New Zealand is consistently ranked as one of the easiest countries in the world to do business[2]. Investing in New Zealand wood processing is easy. Our user-friendly business rules and tax system enables investors to seize a wide range of opportunities with ease and with confidence.

- New Zealand's overseas investment legislation approach aims to attract high-quality foreign investment that emphasises genuine benefits for New Zealanders.
- The New Zealand Emissions Trading Scheme accounts for the carbon sequestration of forests and aligns with international rules.
- High-value wood processing is critical to increasing our wood sector competitiveness. A tax credit of 15 percent for research and development (R&D) spending has been introduced to encourage innovation.

New Zealand has a vibrant wood processing sector that provides significant investment opportunities throughout the commercial supply chain. Most of New Zealand's production forests comprise radiata pine (Pinus radiata), a versatile product that is suitable for a wide range of uses. Our production forests are sustainably managed, and our climate is well-suited to fast growth with the industry harvesting all year round.

Demand for New Zealand wood products is strong. Over 75 percent[3] of wood from our production forests is exported in a variety of forms, including logs, wood chips, sawn timber, engineered wood products, pulp and paper, and further manufactured wooden products. The Government also believes that wood-based products could play a major role in transitioning to a future bioeconomy.

The Government wants to see a strong and flourishing wood sector that creates sustainable partnerships with Māori, builds community resilience, creates and protects jobs across the country, and contributes to our goal of a low-carbon circular economy.

We encourage productive investment to support economic growth and sustainable development. We understand that investors look for stability mixed with opportunity. New Zealand offers you both. Think of New Zealand wood processing as your next destination for high-value investment.

We're open for business.

Hon Shane Jones

Minister of Forestry

Minister for Infrastructure

Minister for Regional Economic Development

Hon David Parker

Minister for Trade and Export Growth

Minister for the Environment

Attorney General

Figures may not sum due to rounding. All figures are in this document are in New Zealand dollars unless otherwise stated.

WHY INVEST IN NEW ZEALAND'S WOOD PROCESSING SECTOR?

Versatility

New Zealand radiata pine has been developed through a high-quality breeding programme. It is recognised around the world as one of the most versatile softwood species. This versatility provides exciting opportunities for investing in both the development and manufacturing of innovative, high-value wood products for global markets.

Sustainability

All production forestry in New Zealand is required to comply with robust environmental standards. New Zealand's strong biosecurity system and sustainable forests provide a competitive advantage to wood processors seeking to secure long-term wood supply.

Increased utilisation of wood resources fits within New Zealand's broader sustainability goals, including a Government commitment to becoming a world leader in climate change action.

Availability

New Zealand's harvested wood availability is forecast to exceed 25 million cubic metres every year for the foreseeable future. New Zealand currently exports over 60 percent of its annual harvest as raw logs. New Zealand's significant wood harvest and log supply present attractive 'volume to value' investment opportunities to develop new world-class wood processing operations.

Capability

New Zealand has a well-established wood processing sector with supporting infrastructure and capability. The New Zealand Government is leading a coordinated effort to grow the sector. This includes initiatives to improve transport and energy infrastructure, workforce skills and R&D, with a long-term vision of transitioning to a bio-based economy.

Stability

New Zealand is the best place for business. We offer a safe, stable and transparent place to invest.

Opportunities exist for investors aligned with our values to develop long-term business relationships with sector participants, including Māori, who hold a significant economic stake in the wood sector.

Image source: Juken New Zealand Ltd.

VERSATILITY

New Zealand radiata pine is recognised as one of the most versatile softwood species available globally.

New Zealand radiata pine makes up 90 percent of New Zealand's production forests[4]. This highly versatile wood source performs consistently well across a wide range of commercial applications from furniture and joinery right through to building construction, paper, packaging and other uses.

Appearance products	Structural products	Engineered wood	Fibreboard and pulp	Modified wood
New Zealand radiata pine has been used for a wide range of appearance-based products such as furniture, panelling, and mouldings, which have been exported worldwide for over 50 years.	Radiata pine's outstanding ability to accept wood treatments enables it to be used in a wide variety of exterior structural applications, ranging from joinery, decking, piles and poles to demanding marine applications.	Radiata pine's ease of machining and gluing has resulted in it being used in a wide range of engineered wood products including laminated veneer lumber (LVL), cross-laminated timber (CLT), plywood and glue laminated products (Glulam).	As a source of wood fibre, radiata pine underpins New Zealand's medium density fibre board (MDF), paper and packaging products which, have competed on the world stage for many years.	The 'treatability' of radiata pine has made it the species of choice for new wood modification technologies, including thermal modification processes such as Kebony and Accoya.

The versatility of New Zealand radiata pine is helping to open up new investment opportunities in the wood processing sector.

A 2019 report prepared by international consultancy firm Forest Economic Advisers (FEA) identified a range of existing and new products with potential to expand New Zealand's wood exports[9].

Image source: Juken New Zealand Ltd.

Potential export growth opportunities*

Product	Currently manufactured in New Zealand	Potential export growth opportunity
Lumber – structural	Yes	Upgrade structural properties to increase sales into Australia.
Lumber – appearance	Yes	Follow growth curve for European exterior products using green chemistry. Modify appearance-grade wood in New Zealand (see durability products).
Lumber – industrial	Yes	Identify new industrial markets. Potential to enhance with LFL® type technology.
Panels (Particleboard/ MDF/Oriented Strand Board (OSB)/Plywood)	Yes (except OSB)	Highly fragmented export markets. Best suited to strategic investors/industry players with market channel.
Laminated Veneer Lumber (LVL)	Yes	Upgrade structural properties to meet E13/E14 LVL market in Australia.
Laminated Strand Lumber (LSL)	No	Possibility to add value to corewood. Unproven in New Zealand. Requires technology agreements to access intellectual property (IP).
Cross Laminated Timber (CLT)	Yes	Domestic and export growth potential. Can also incorporate into offsite manufacturing solutions eg flat-packed housing for export. Mid-rise building construction substitution.
Wood pellets	Yes	Brownfield expansion of existing players likely due to Asian growth.

Source: Export growth opportunities for New Zealand processed wood – A market review of selected products. November 2019. FEA. *excluding assessment of pulp and paper products.

Selected new and evolving wood products with export potential*

Product	Currently manufactured in New Zealand	Potential export growth opportunity
LFL® Advanced Framing Lumber	No	New Zealand sawmills could use off-cuts and lower-strength boards to produce an engineered wood product.
Other evolving structural products	No	Zeno® Plus, Panobloc, Mass Plywood Panels, Magnumboard®, Kerto Ripa Box™ are examples.
Wood fibre insulation products	No	Wood fibre, typically as chips, is used to make a natural insulation board in Europe. Potential to manufacture in New Zealand.
Durability products	Yes	Increase manufacturing of modified wood in New Zealand for domestic and export markets.
OEL™ Optimised Engineered Lumber	Yes (pilot plant)	New Zealand engineered wood product company – expansion opportunities.
Multipoles	Yes	New Zealand construction foundation solution with major export growth potential.
Bio-based products	No	New technologies for New Zealand manufacturing of bio-plastics, bio-fuels and bio-chemicals.

Source: Export growth opportunities for New Zealand processed wood – A market review of selected products. November 2019. FEA. *excluding assessment of pulp and paper products.

In addition to these potential export growth opportunities, there are also opportunities in the domestic market including growth in demand for structural lumber, mainly driven by growth in residential house construction.

New Zealand Trade and Enterprise (NZTE) is actively supporting investors across a diverse range of projects that reflect the versatility of New Zealand pine and the wide range of potential opportunities available.

SUSTAINABILITY

Our production forests are dominated by sustainable, certified, highly-productive tree species.

New Zealand's 1.7 million hectares[4] of production forests are dominated by highly-productive, fast-growing radiata pine, a coniferous softwood species with a typical harvest yield of 640–690 cubic metres per hectare[5]. New Zealand understands its forest resources very well. Decades of forest research have led to major improvements in tree growth performance and tractability.

One million two hundred thousand hectares are certified by the Forest Stewardship Council (FSC). Five hundred thousand[6] hectares are also certified under the Programme for the Endorsement of Forest Certification (PEFC).

FSC and PEFC are globally-recognised certification systems that ensure these forests are managed according to a set of environmental, social and economic standards, and that they have been independently inspected and evaluated.

One Billion Tree programme

The Government has allocated $480 million from its $3 billion Provincial Growth Fund (PGF) towards the One Billion Trees programme. The One Billion Trees programme supports farmers to grow both native trees and exotic trees based on delivering the "right tree, in the right place, for the right purpose". This programme includes $118 million for direct tree-planting grants for farmers and $120 million for partnership projects.

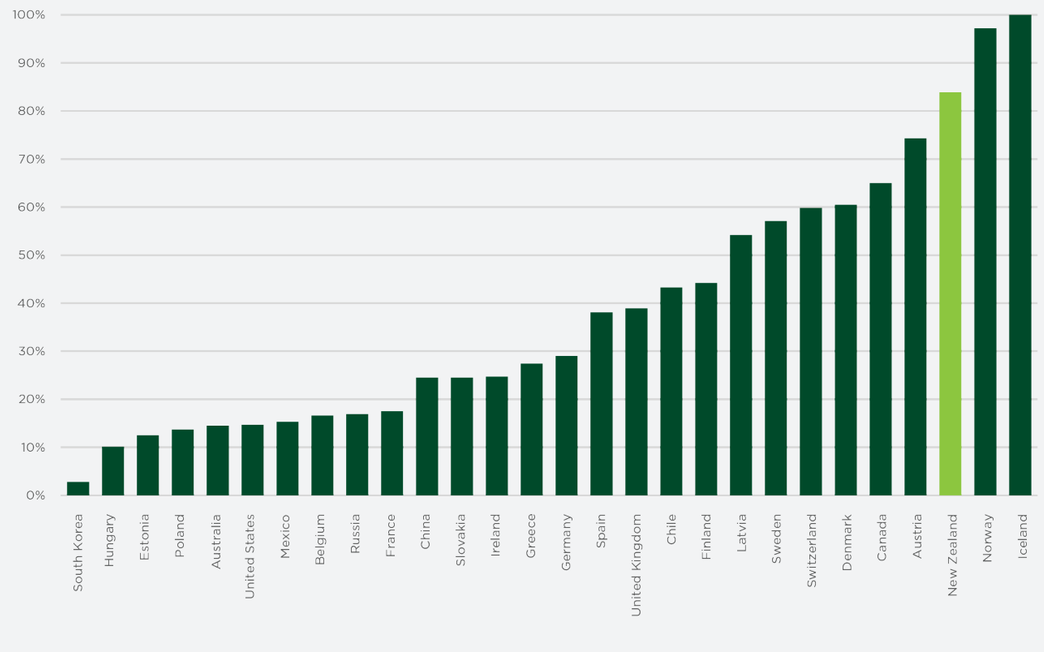
Forty-two innovative projects have been funded during 2019, including new planting, R&D studies, development of industry standards to reduce the risk of spreading pests and pathogens and support for nursery practice guidelines.

Biosecurity

Large scale beetle infestation challenges faced by a number of offshore production forestry regions have highlighted the importance of biosecurity in protecting our forest resources. New Zealand's rigorous biosecurity controls, coupled with our natural advantage as an island nation, provides investors with a high degree of confidence that New Zealand's wood supply will remain viable and sustainable into the future.

New Zealand is on the path to a low-emissions, climate resilient future.

Renewable energy as % of total generation



Source: IRENA – International Renewable Energy Agency.

Renewable energy

New Zealand's renewable energy supply is world class. New Zealand has one of the highest renewable primary energy supplies in the OECD, including major contributions from geothermal, hydro and woody biomass sources. Over 80 percent of New Zealand's electricity comes from renewable sources[7].

Climate change action

The Government is committed to New Zealand becoming a world leader in climate change action. New legislation enacted in 2019 provides a framework by which New Zealand can develop and implement clear and stable climate change policies that contribute to the global effort under the Paris Agreement. This includes targeting a reduction of greenhouse gas emissions (other than biogenic methane) to net zero by 2050.

An independent Climate Change Commission was established in 2019 to provide advice to the Government on climate change mitigation and adaptation, and to monitor progress towards the new 2050 target and emissions budgets.

Harvested wood products (products made from timber such as furniture or framing for buildings) bring benefits to New Zealand by mitigating climate change through carbon storage and contributing to our international climate change targets. The New Zealand Government is looking at ways of how best to recognise and incentivise the carbon stored in these products.

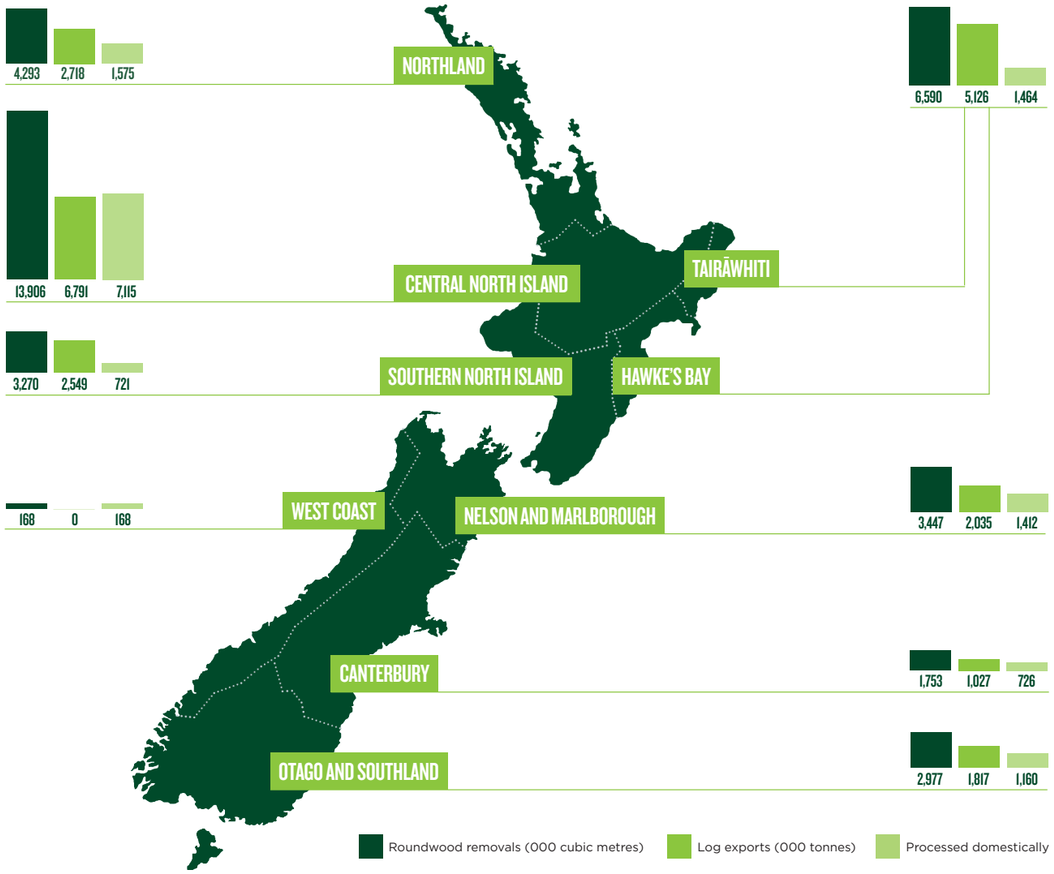
AVAILABILITY

New Zealand's significant wood harvest and log supply present attractive 'volume to value' investment opportunities to develop new world-class wood processing operations.

New Zealand currently produces nearly 36.5 million cubic metres of wood each year. New Zealand's annual wood harvest has increased by more than 80 percent over the past decade.

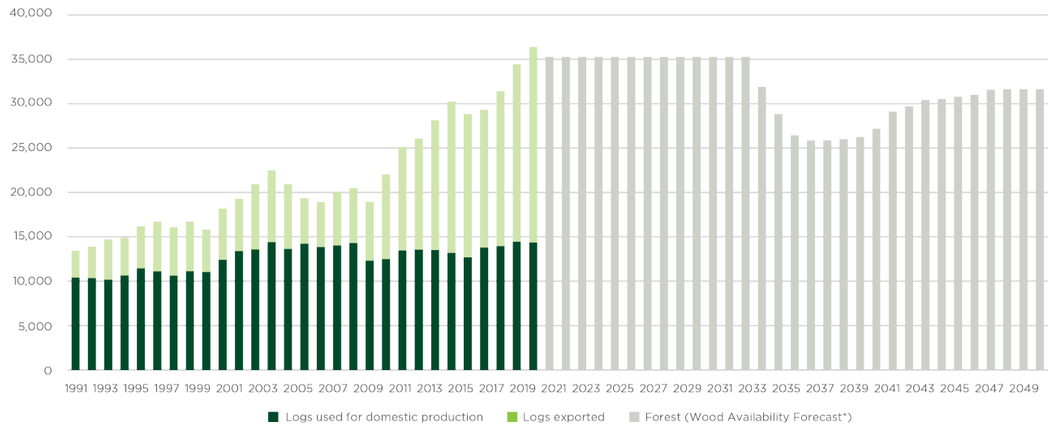
New Zealand is one of the world's leading roundwood (log) exporters with 19 percent of the global market[8]. We currently export 22.3 million cubic metres of logs each year. These logs represent a major wood supply opportunity for investors looking to source logs for new wood processing operations in New Zealand.

New Zealand's ambition is to be a leading global supplier of sustainable wood products. The New Zealand Government is focused on shifting the economy from volume to value through increasing production of high-value goods and services.



Source: MPI – Estimated roundwood removals by wood supply region; Stats NZ & Te Uru Rākau March 2019 quarterly trade export data.
One log export tonne is approx. equal to one cubic metres of log harvested. Refer to page 62 for further source detail.

Roundwood removals, actual vs forecast



Source: MPI Forestry Production Statistics, MPI Wood Availability Forecasts. *Wood availability forecast is based on a 26 year harvest rotation.
Note: MPI – Forecasts are December year end and Actuals are March year end.

Global softwood demand continues to rise and long-term fundamentals are attractive.

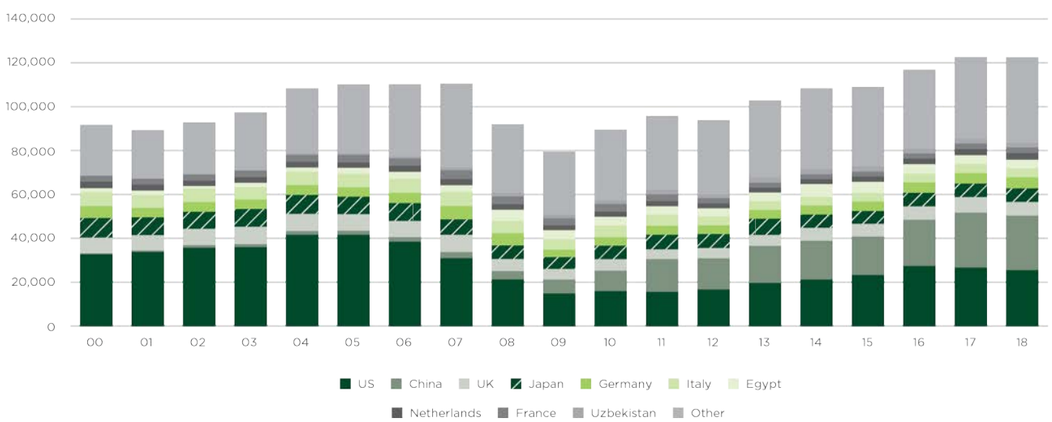
Global demand for coniferous softwood lumber has continued to rise with global imports increasing more than 50 percent since 2009 reaching over 120 million cubic metres in 2018[9].

New Zealand currently has 1.5 percent of the global softwood lumber export market.

New Zealand FSC and PEFC certified wood products are already recognised and sold into many international markets and are expected to benefit from any future growth in coniferous softwood demand.

The combination of attractive long-term supply and demand fundamentals offers opportunities to invest across the wood processing value chain to process greater quantities of New Zealand logs into new high-value wood products for domestic and export markets.

Global softwood lumber imports



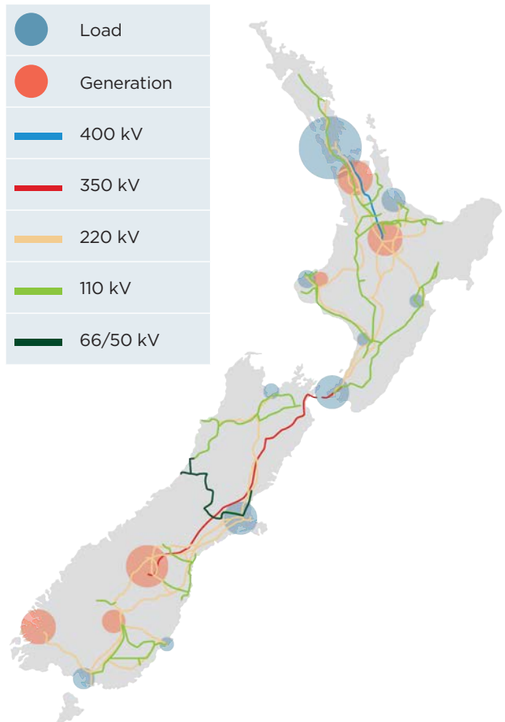
Source: FEA Export growth opportunities for New Zealand processed wood – November 2019.

CAPABILITY

The New Zealand Government is leading a coordinated effort to enhance existing infrastructure and capability to help grow the wood processing sector.

New Zealand has a proud history of wood processing from production forests. The wood sector (comprising forestry and wood processing) is a vital part of the New Zealand economy, generating $6.6 billion in annual export revenues[3] and is a priority for the New Zealand Government.

Existing and new entrants in wood processing are looking to scale towards globally competitive and highly-productive operations that are sustainable in the long term. The Government is supporting this development and growth through a range of core policy and funding initiatives.



Source: Transpower.

People

New Zealand has one of the highest labour participation rates in the OECD. Investors can benefit from access to an extensive wood sector workforce of around 35,000 people across the country including a wide variety of trained and experienced wood processing personnel.

The Government is developing a Forestry and Wood Processing Workforce Action Plan to develop and strengthen the sector's workforce. The Action Plan will support the development of a skilled, safe, diverse workforce that meets the current and future needs of the forestry and wood processing sector.

Power

New Zealand has a high voltage electricity network (known as the 'National Grid') running nearly the length of the country. The National Grid consists of a backbone of 220 kV high voltage alternating current (HVAC) transmission lines in both the North Island and South Island connected by an inter-island high voltage direct current (HVDC) link.

A range of sophisticated electricity hedging services are available to wood processing operators to manage electricity price risk.

In the Tairāwhiti region Central Government has engaged with local agencies and Eastland Group over the possibility of increasing electricity supply to catalyse new investment in wood processing. Central Government has indicated that it is prepared to consider options, including building a new transmission line into the region.

Geothermal energy

New Zealand has commercial sources of geothermal energy capable of providing direct industrial process heat and electricity. This energy source offers an attractive competitive advantage for existing and new wood processing operations located in geothermally active areas of the country, including the Central North Island (CNI), New Zealand's largest wood supply region.

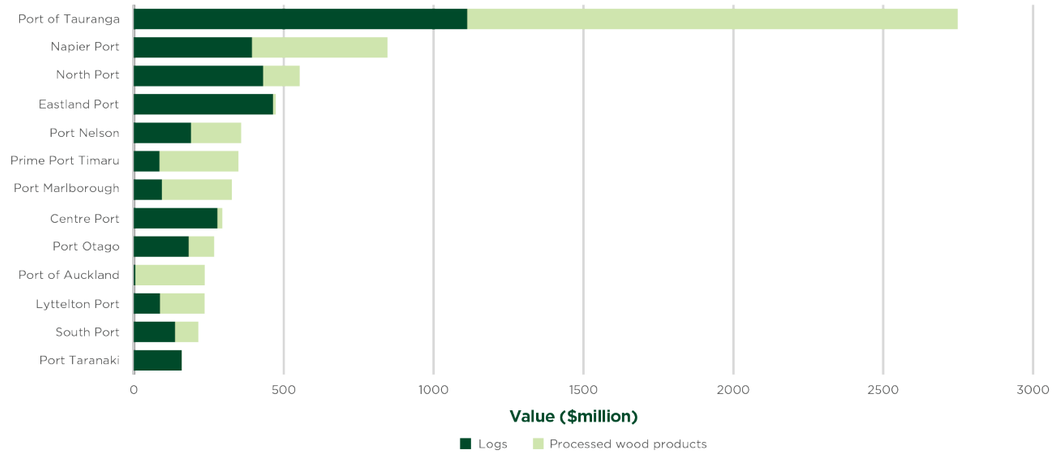
Transport infrastructure

New Zealand has a well established port, rail and road transport infrastructure which currently supports over 20 million cubic metres of wood exports every year. This includes a nationwide network comprising almost 11,000 kilometres of state highways, over 4,000 km of rail and 13 ports.

Key wood export ports are strategically located around New Zealand with established road and rail links. Local government is heavily invested in the port sector and many ports have substantial expansion plans to support export growth.

In 2019, the Government announced a $1 billion funding boost to support a redevelopment of the national railway company KiwiRail, which includes $300 million for investment in regional rail initiatives that will improve links between wood suppliers and regional ports. In January 2020 the Government announced a $12 billion infrastructure package including $6.8 billion to be spent on transport infrastructure.

New Zealand wood exports by port



Source: MPI – Data as at 30 September 2019.

Research and innovation

Government research agency Scion has built a reputation as a world leader in forest industry science and innovation. Scion leads R&D in sustainable forest management, forestry biosecurity, forestry-based ecosystem services, wood processing, wood related bioenergy, waste streams and other biomaterials. It has developed a distinct multidisciplinary capability that spans the value chain, from germplasm generation through to the design and application of timber, fibre and other forest resources in commercial products and services.

The Ministry for Primary Industries (MPI) has introduced the Sustainable Food and Fibres Futures programme to fund innovative projects that will create more value from the food and fibre industries, including the wood sector. The programme will provide approximately $40 million each year on a co-investment basis.

Export market access

New Zealand has entered into free trade agreements (FTAs) with key wood export destinations China, Australia, South Korea and Thailand. FTAs open up market opportunities, streamline processes, reduce costs and create more certainty for wood processors doing business overseas.

STABILITY

New Zealand is the best place for business.
We offer a safe, stable and transparent place to invest.

1ST
BY THE WORLD BANK FOR EASE OF DOING BUSINESS[1]

2ND
IN THE WORLD FOR PEACEFULNESS ON THE GLOBAL PEACE INDEX[12]

3RD
ON THE INTERNATIONAL PROPERTY RIGHTS INDEX 2019[10]

3RD
IN PROTECTING MINORITY INVESTORS 2019[13]

2ND
ON TRANSPARENCY INTERNATIONAL'S CORRUPTION PERCEPTIONS INDEX[11]

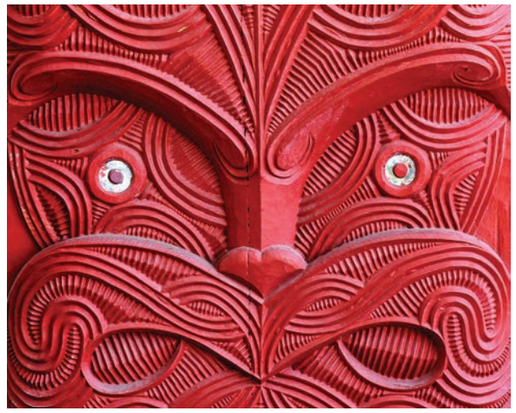
10TH
ON THE BLACKROCK SOVEREIGN RISK INDEX 2019[14]

New Zealand has a high performing economy. Our stable political environment, economic resilience and transparent financial markets underpin strong investor confidence.

With low sovereign risk and a strong balance sheet position, New Zealand is recognised globally as a safe place to invest and do business.

New Zealand has relatively low business operating costs compared to other OECD countries. It has a straightforward, business-friendly, and streamlined taxation system that supports capital development, R&D and international investment.

Opportunities exist for investors aligned with our values to partner with and develop, long-term business relationships with sector participants, including Māori.



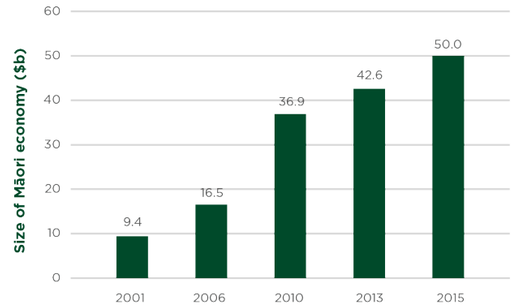
Partnering with Māori

Māori are the indigenous people of New Zealand. Fifteen percent of the New Zealand population identifies as Māori, and iwi (Māori tribal groups) are important participants in the New Zealand economy. The total asset base of the Māori economy has grown rapidly over the past 15 years and has previously been estimated at around $50 billion.

Māori are long-term investors with a strong focus on environmental, social and cultural outcomes.

Māori have an important role in the wood sector. They already own some 40 percent of the commercially planted forest land in New Zealand and wish to participate more actively in value-added wood processing investment opportunities to achieve greater economic returns and social benefits for their people and for New Zealand.

The Māori economy is a significant contributor to the New Zealand economy



Source: KPMG estimate based on Te Puni Kōkiri, Māori Economy Report 2013 plus 5 percent per annum growth to 2015.

"While investment opportunities must make commercial sense, deriving profit is not the only consideration for Māori. Given their long-term investment horizon, and desire to create inter-generational wealth, opportunities that align with cultural, social and environmental goals may be viewed more favourably."

KAITOHU – DIRECTOR MĀORI CUSTOMERS, NEW ZEALAND TRADE AND ENTERPRISE

Partnering with industry

Partnering arrangements with the wood processing sector are common and effective in New Zealand. Offshore investors are already significant owners of New Zealand wood processing operations, including companies from Japan, Australia, China, South Korea and Europe.

A number of existing New Zealand wood processing companies are looking at expanding and/or diversifying their operations to capture operational efficiencies and reduce risk. These expansions offer potential opportunities for international investors to partner, to provide both capital and product distribution.

SECTOR OVERVIEW

The New Zealand wood processing sector is a significant part of the New Zealand economy generating $3 billion in annual exports[7].

Wood processing operations are located throughout New Zealand, producing a wide range of products from lumber through to engineered wood products, pulp and paper and other value-added products.

The New Zealand Government is collaborating with industry to investigate current and emerging wood-based technologies that can support New Zealand's transition to a bioeconomy.

Image source: Coastlands Aquatic Centre, Timberlab.co.nz.

PRODUCTS AND MARKETS

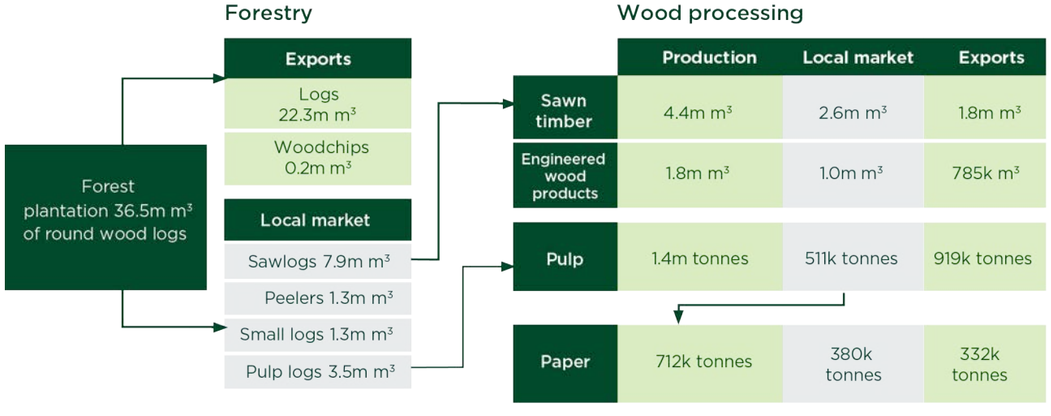
New Zealand's wood processors manufacture a diverse mix of lumber, engineered wood products, pulp and paper and other wood-based products.

Almost 40 percent of New Zealand's annual log harvest is transformed by local wood processors into a variety of products for domestic and export markets.

New Zealand produces 4.4 million cubic metres of lumber every year, with 2.6 million cubic metres consumed domestically in applications such as building construction as well as remanufactured into higher-value finished components such as joinery, furniture and for industrial use. New Zealand also manufactures 1.8 million cubic metres of engineered wood products including plywood, veneer, fibreboard, particleboard, cross-laminated timber, poles and other products.

New Zealand has significant pulp and paper operations generating 1.4 million tonnes of pulp for domestic and export markets. Key pulp products include bleached softwood market pulp, kraft linerboard, and fibre cement pulp.

Wood production, domestic consumption and trade

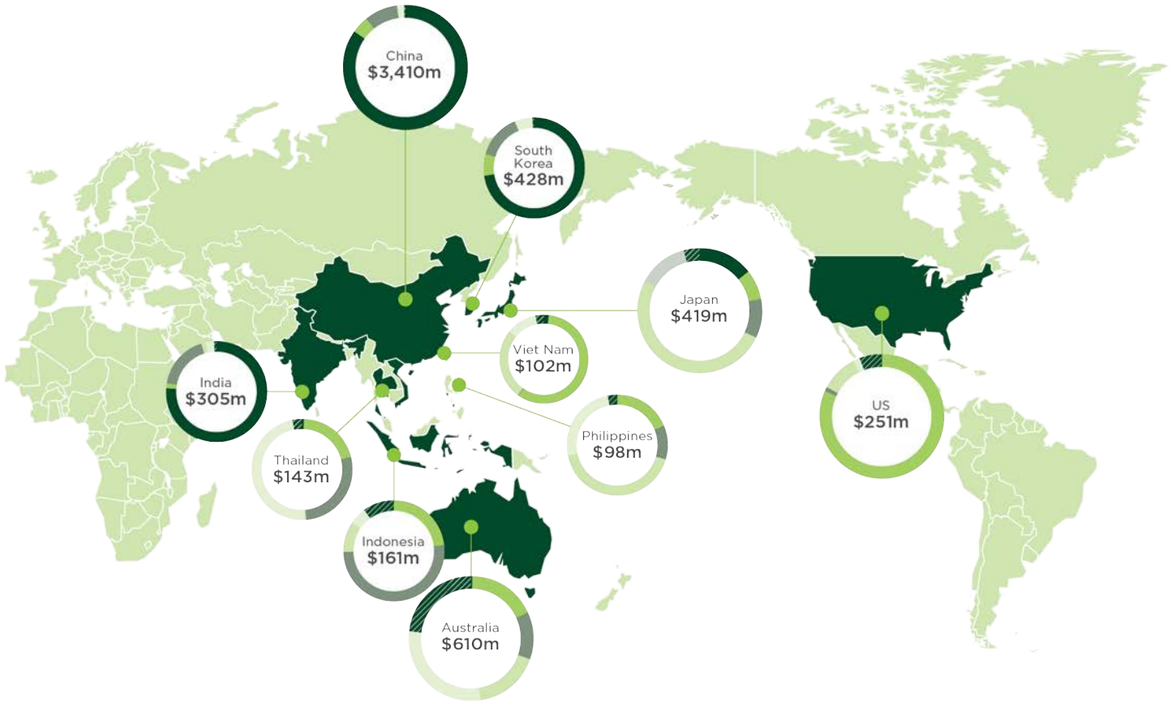


MPI – Data as at 30 September 2019.

The wood sector currently contributes $6.6 billion in annual export revenues, including $3 billion from processed wood products. New Zealand's wood sector export revenues have increased by nearly $3 billion in the last decade driven by growth in sales of logs, pulp and lumber[3].

The largest processed wood exports by annual value comprise lumber ($889 million), panels ($166 million) and pulp, paper and paperboard ($498 million).

Key markets for New Zealand processed wood products (ie excluding logs) vary by product grouping. The Australian market absorbs a broad range of New Zealand products across lumber, pulp, panel products, paper and paperboard, and other forestry products. New Zealand exports to the United States market are dominated by lumber. The Japanese market is mainly a panel market with smaller contributions from pulp and chip. While in China, Indonesia, Thailand, Taiwan, India and South Korea the focus for New Zealand imports is principally on lumber and pulp.

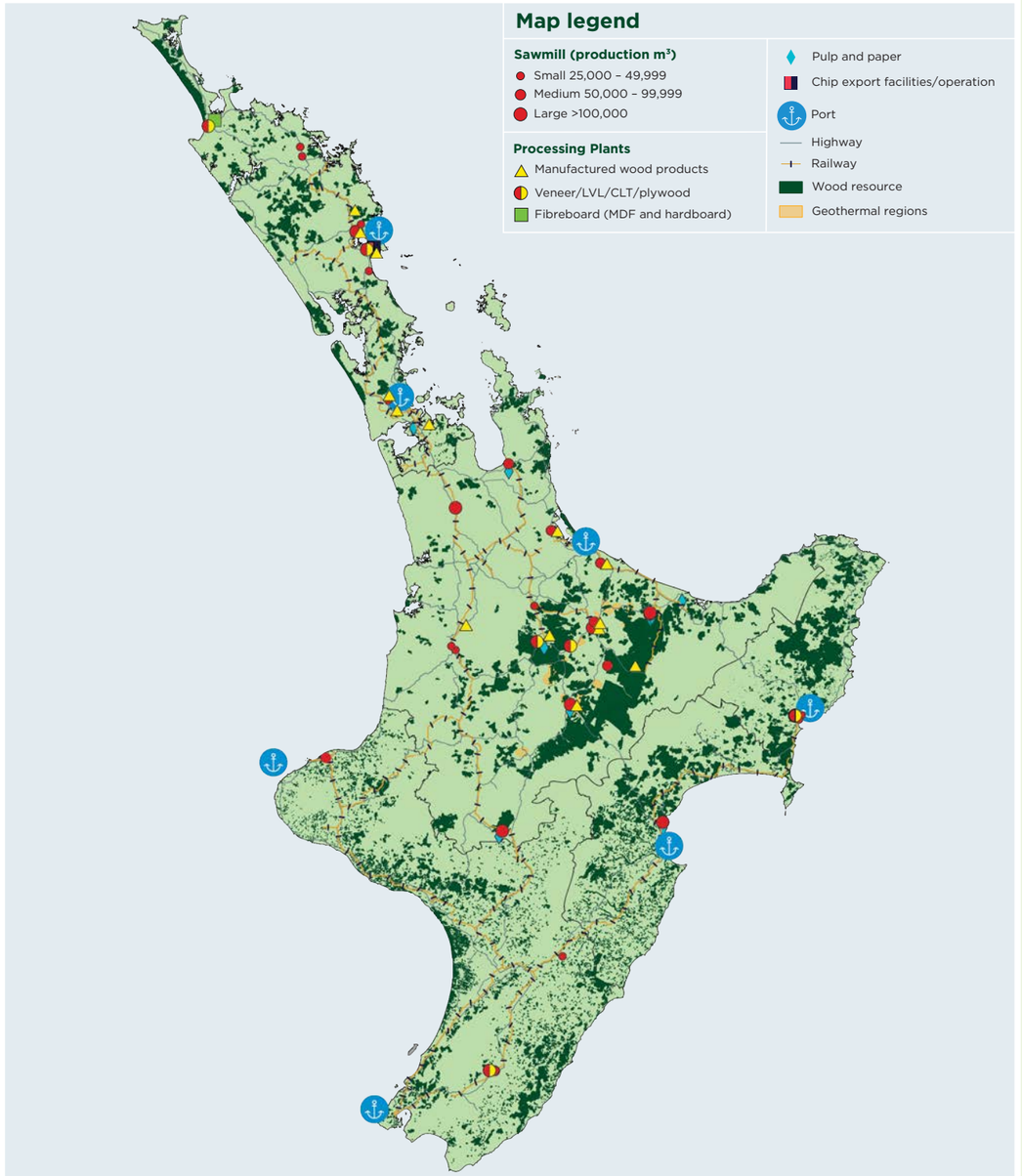


Source: Situation and Outlook for Primary Industries for the year ended 31 March 2019.

Product	Total export revenue $ million (Sept 2019)	% of Total
Logs	3,616	55%
Sawn timber and sleepers	889	14%
Pulp	752	11%
Panels	500	8%
Paper and paperboard	497	8%
Chips	59	1%
Other forestry products	250	4%
Total forestry	**6,566**	**100%**

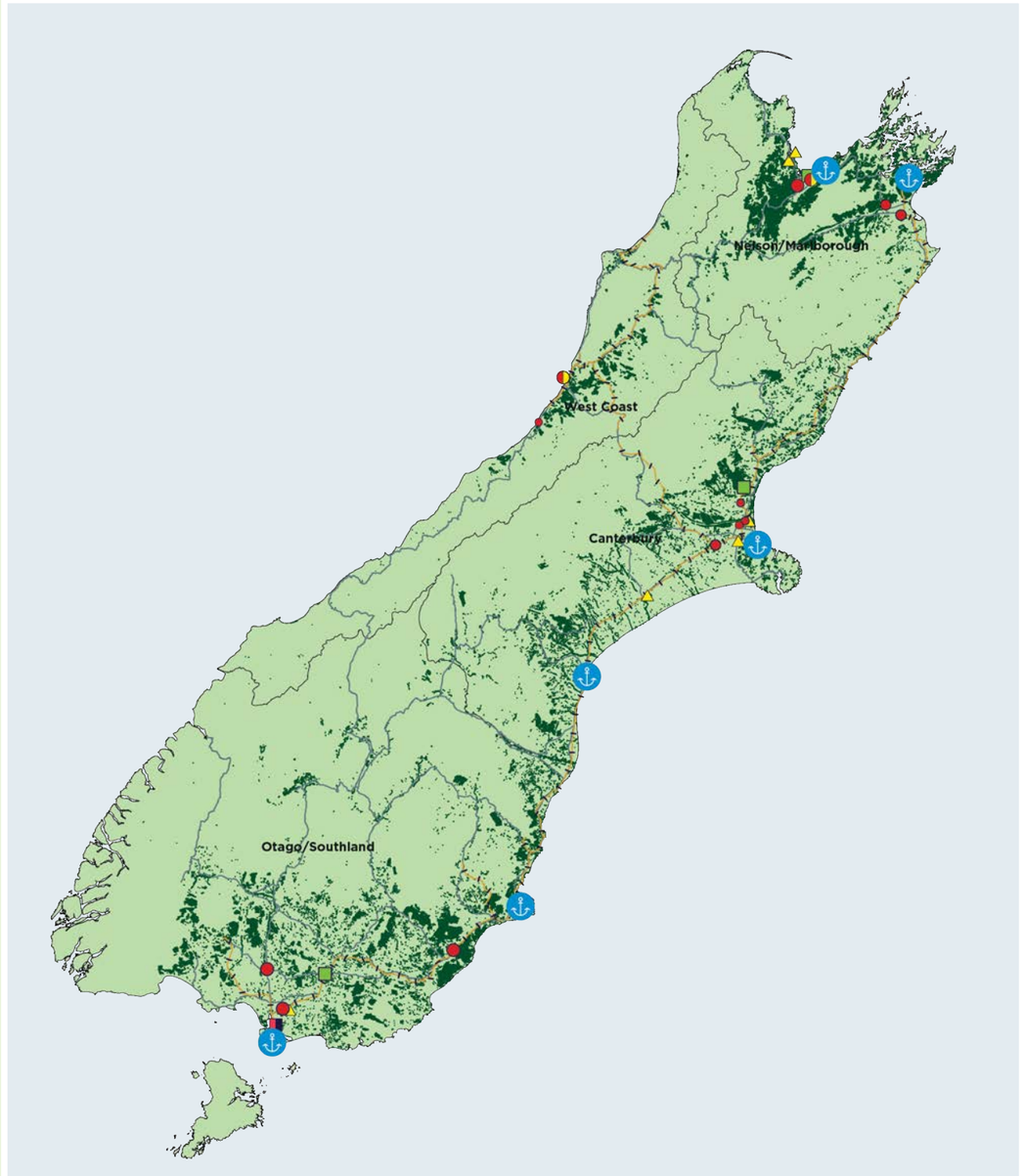
WOOD PROCESSING INFRASTRUCTURE MAP

Te Ika-a-Māui North Island



Source: Indufor – data as at November 2019.

Te Waipounamu South Island



Source: Indufor – data as at November 2019.

New Zealand wood processing map summary	
1,697,900 ha	Production forest
11,000 km	State highways
4,000 km	Rails
13	Ports
42	Sawmills over 25,000m³ per annum
23	Manufactured wood products^
14	Engineered wood plants^
8	Pulp plants^
2	Chip export facilities over 50,000 BDU per annum

Notes: ^A minimum size for inclusion of wood manufacturing on this map is operations producing >20,000m³ finished wood products.

REGULATORY FRAMEWORK

The New Zealand Government is making it easier and more attractive to invest across the wood sector value chain.

Rules for overseas investors

Overseas investors are required to obtain consent through the Overseas Investment Office (OIO) before they can invest in New Zealand's sensitive land or significant business assets, including forestry rights. A new 'streamlined approval path' has been set up to accommodate overseas investors seeking to acquire existing forest rights or develop new forests. This offers opportunities for wood processors to increase vertical integration of their operations into forestry ownership and reduce wood supply risk.

Protecting people

New Zealand has a comprehensive set of employment laws that help keep workplaces fair. These include a strong commitment to workplace health and safety. New Zealand health and safety regulations require that workers and others are given the highest level of protection from workplace health and safety risks, so far as is reasonably practicable. This includes risks to both physical and mental health.

Protecting the environment

New Zealand has a range of legislation designed to protect the environment and promote sustainable management practices. The New Zealand Government has also recently created the National Environmental Standards for Plantation Forestry (NES-PF) which provide nationally consistent rules to manage the environmental effects of afforestation, forest management and harvesting.

Taxation

As well as its simplicity, New Zealand's tax system has the major attractions of predictability and fairness. Companies and corporates are taxed at a flat rate of 28 percent. New Zealand also has a tax on consumption called Goods and Services Tax (GST). It is a flat rate tax – currently 15 percent – that is added to almost all purchases.

Other key features of New Zealand's tax system include:

- No payroll tax or social security tax.
- No general capital gains tax, although it can apply to some specific investments.
- No local or state taxes, apart from property rates levied by local councils and authorities.
- No healthcare tax, apart from a very low levy for New Zealand's Accident Compensation injury insurance scheme.

The Government has also introduced a R&D tax incentive that includes a credit rate of 15 percent for a minimum R&D expenditure of $50,000 per year.

https://www.newzealandnow.govt.nz/living-in-nz/money-tax/nz-tax-system

A BIOECONOMY FUTURE

We offer an attractive location for investors to utilise current and emerging wood-based technologies to develop the New Zealand bioeconomy.

Around the world there is growing interest and investment in developing bioeconomy strategies and deploying biorefinery technologies as a way to transition to a low-emissions economy. The World Economic Forum ranked 'Bioplastics for the Circular Economy' as the number one emerging technology for 2019.

Increasing use of wood and wood fibre has the potential to underpin New Zealand's transition over the medium to long term to a bioeconomy that uses these renewable resources to produce food, energy, products and services.

The New Zealand Government's forestry and wood research organisation Scion, is engaged in research to expand opportunities in the wood fibre, pulp, biopolymer, packaging and biochemical industries, and to increase New Zealand's energy security through the use of forest and waste biomass for bioenergy.

The New Zealand Government and the wood industry are working collaboratively to develop a strategy and approach to address investment uncertainty and information gaps in the emerging bio technology and bio products market. This includes jointly funding a global study to identify the most viable commercial opportunities for investment in bio technologies and bio-based products that use wood and wood fibre; to facilitate New Zealand's transition to a bioeconomy.

Scion – current opportunities

Modified wood

Modified wood technologies seek to improve durability, stability, colour and hardness of sustainably grown, but not naturally durable timbers such as radiata pine.

This enables these timbers to compete with naturally durable, tropical hardwoods.

Woodforce

This technology enables wood fibres to reinforce thermoplastic polymers. The technology involves manufacturing wood fibre dice using an existing MDF line. These dice can be readily used by plastics manufacturers (with standard plastics processing equipment) in a range of applications including automotive, furniture, appliances and general consumer goods.

Niche compounding

In response to growing public pressure against single-use plastics, Scion has identified various opportunities where a custom bio based formulation can address pollution.

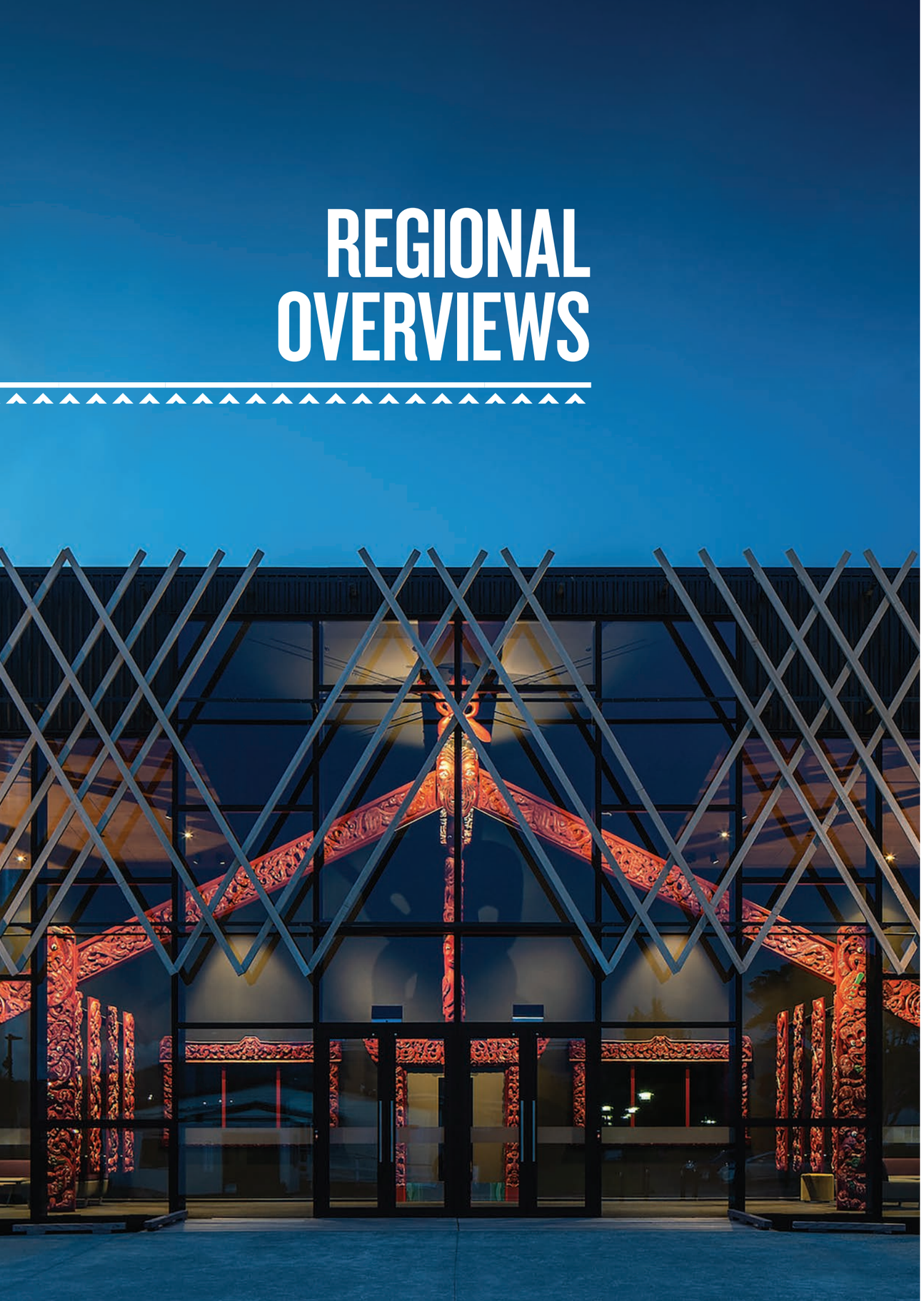
Ligate™

Scion's Ligate™ bio adhesives are free of petrochemicals and formaldehyde, and are made from 100 percent renewable plant resources including lignin, a by-product of papermaking.

These water-based, non-toxic bio adhesives are compatible with existing adhesive and panelboard manufacturing equipment.

ligate.co.nz

REGIONAL OVERVIEWS



New Zealand's key wood supply regions offer diverse opportunities for wood processing investors, reflecting a range of key supply factors particular to each region.

New Zealand has nine wood supply regions, eight of which host more than 50,000 hectares of production forest. This section provides a summary of these eight key regions (excluding the West Coast) highlighting key features, variations and potential wood processing opportunities.

When assessing a regional location, investors will need to consider a range of key supply-side factors.

These factors can vary from region to region and include:

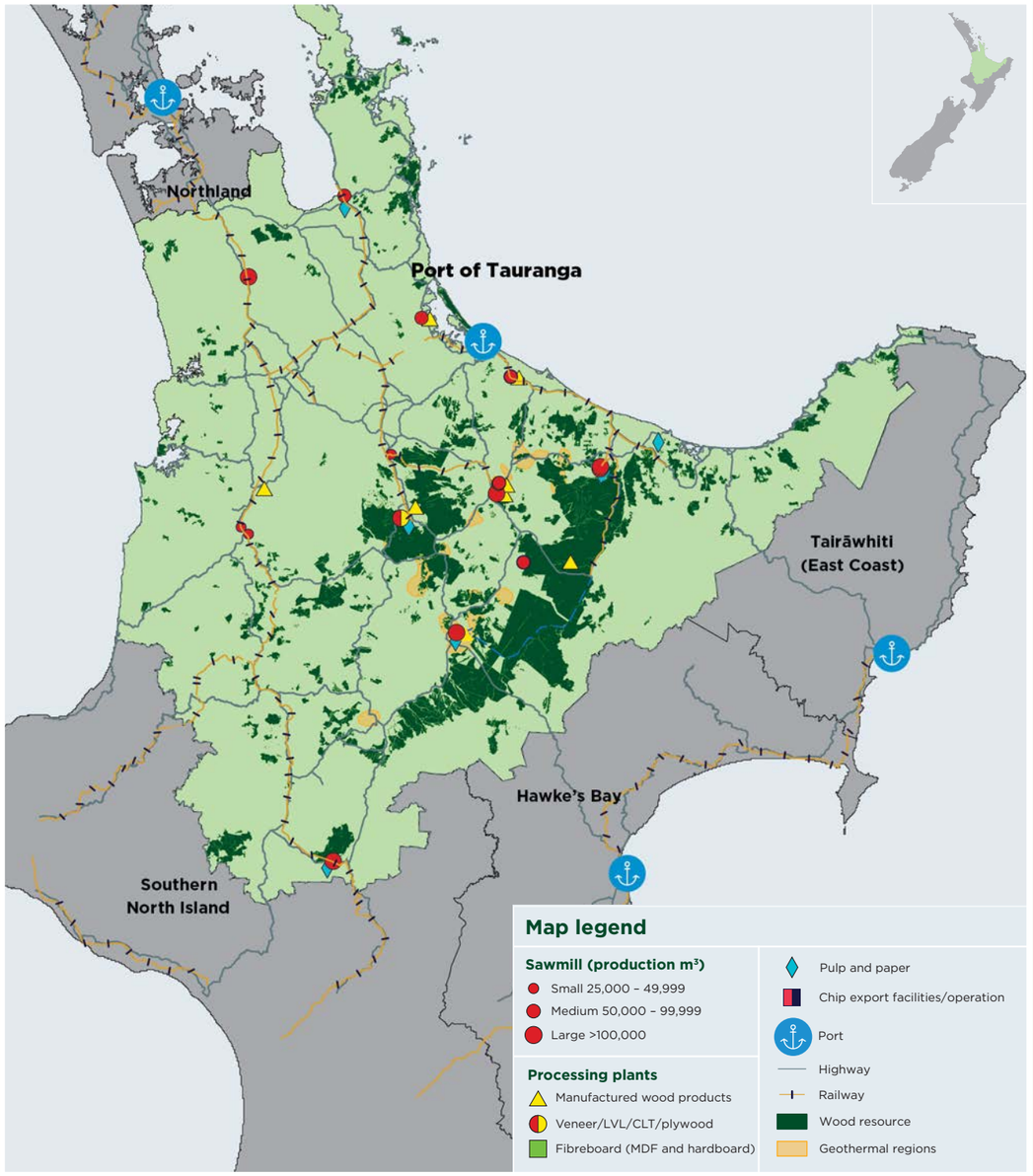
- Quantity and quality of available wood resources.
- Access to suitable land for industrial/manufacturing use.
- Access to electricity and thermal energy (including geothermal power in some regions) and/or the ability to generate energy on site.
- Potential to locate in close proximity to other existing or proposed processors to maximise efficiencies around energy, residue use and supply chain logistics.
- Transport logistics including rail access, road access, distance to ports, available port facilities and distance to domestic and export markets.
- Environmental, social and community considerations including support from Māori and other regional stakeholders.
- Costs of key inputs due to site-specific factors.

NZTE, supported by expertise from Te Uru Rākau, can provide assistance to ensure that qualified investors have access to the local knowledge, experience and networks inside New Zealand to select an appropriate wood supply region or regions, for more detailed feasibility assessment depending on your requirements.

Image source: Te Ara a Tāwhaki – Otaki, New Zealand. abodo.co.nz

CENTRAL NORTH ISLAND

Wood supply region



Source: Indufor – data as at November 2019.

The Central North Island (CNI) is New Zealand's premier forestry and wood processing region. The CNI has New Zealand's largest wood supply by far and hosts major New Zealand sawn timber and pulp and paper mills. Attractive wood supply fundamentals coupled with access to renewable geothermal energy, excellent transport and port links makes this region a key target for investors looking for wood processing expansion opportunities.

Potential investment opportunities include:

- Securing current export logs for large-scale New Zealand-based sawmilling.
- Partnering with Māori to develop vertically integrated wood businesses.
- Expanding mass timber (LVL,CLT, OEL) production for the construction sector.
- Developing a new particleboard/MDF mill.
- Creating an engineered wood processing hub that focusses on innovation and international marketing of prefabricated engineered wood products.
- Leveraging the supply chain efficiencies of the Port of Tauranga to export mass timber products (eg CLT).
- Integrating geothermal heat energy with wood processing.
- Developing a bio-refinery.

Products and markets

Wood processing facilities are located throughout the CNI region, with a concentration of pulp and sawmill activity within the Kawerau, Rotorua, Taupō and Tokoroa areas. The CNI processors manufacture lumber and panel products for export and the local New Zealand market, and are well located to feed products into the main domestic construction markets of Hamilton, Tauranga, and Auckland. The scale of processing in the region also provides a significant pool of experienced labour.

Sawmilling facilities in the region have a combined intake capacity of approximately 3.2 million cubic metres per annum and produce around 1.6 million cubic metres of lumber. The largest sawmills in the CNI produce predominantly structural timber including major mills at Kawerau, Rotorua and Taupō. The CNI region has also traditionally been a major supplier of pruned logs, and consequently a significant number of processors have developed their facilities specifically for utilising the pruned resource to produce a range of high-value, clearwood products.

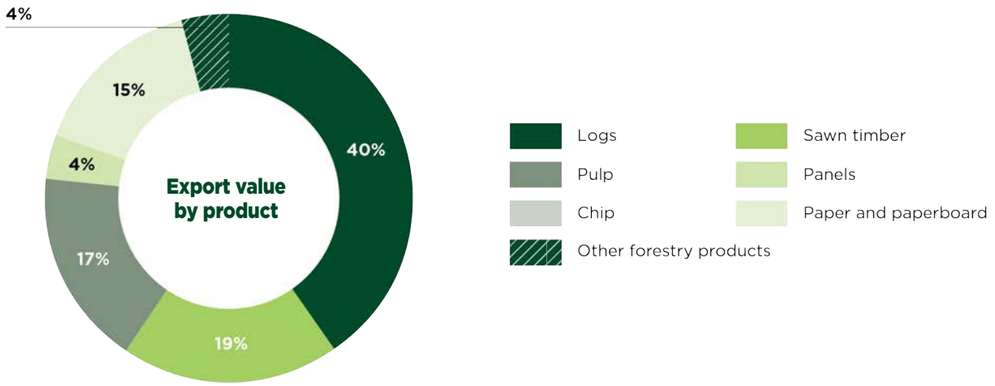
The CNI is New Zealand's largest pulp producing region. Pulpwood processing facilities (pulp and paper and reconstituted panels) have a combined log intake capacity of around 2.9 million cubic metres per annum and generate over $450 million in export revenues.

Existing operators continue to innovate and invest in diversifying and expanding their operations.

563,000 ha of production forests[4]	**13.9 million cubic metres** annual roundwood harvest[3]	**35*** wood processing facilities	**$1.11 billion** annual log exports[3]	**$1.64 billion** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Port of Tauranga wood exports



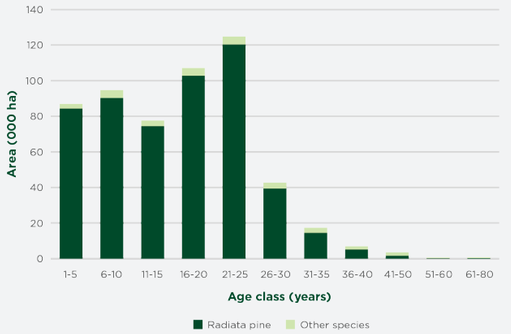
Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	6,970,951	NZ$	$ 1,111,751,870
Sawn timber	cubic metres	947,527	NZ$	$ 522,397,039
Pulp	tonnes	462,323	NZ$	$ 456,841,373
Panels				
Fibreboard (incl MDF)	cubic metres	100,427	NZ$	$ 42,809,433
Particleboard	cubic metres	29,197	NZ$	$ 14,752,536
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 37,469,923
Veneer	cubic metres	46,167	NZ$	$ 19,059,266
Chip	bone dry units	867	NZ$	$ 421,570
Paper and paperboard	NA	–	NZ$	$ 421,868,223
Other forestry products	NA	–	NZ$	$ 120,744,129

MPI – Data as at 30 September 2019.

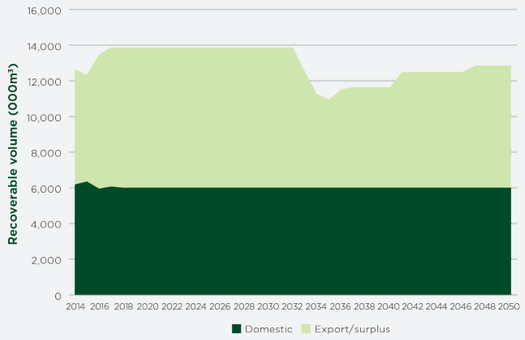
Port and transport logistics

CNI's regional port, The Port of Tauranga, is New Zealand's largest and fastest growing port, handling 35 percent of New Zealand's exports. For the year ended 30 September 2019 the Port of Tauranga exported 7.0 million tonnes of logs and 1.6 million tonnes of other wood products.

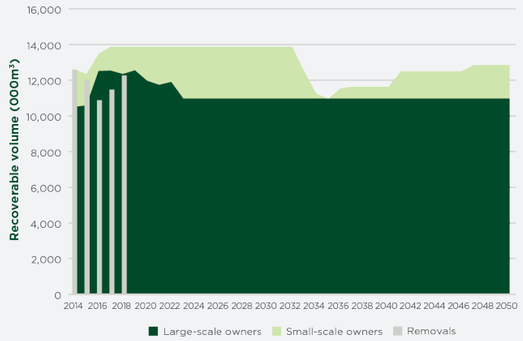
The port utilises an exceptional road and railway network attracting cargo from within and beyond the region. The port links directly to the Waikato Expressway, State Highway 2 and the East Coast Main Trunk railway line, providing access to key forestry and wood processing operations. A major private forest road network allows for large-scale trucking 'off-highway' through key parts of the CNI forest estate. A bimodal container terminal is also planned to be established in Kawerau in the near future.



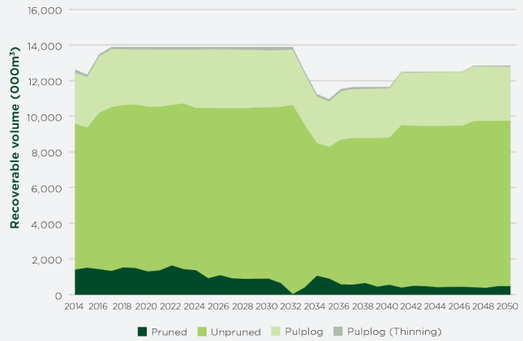
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).

Wood supply

CNI is a well-established forestry region with most large-scale forest owners onto their second rotation (or more). Radiata pine is the dominant production species. Silvicultural practices have evolved to maximise each site, leading to a higher quality log mix suited to domestic processing.

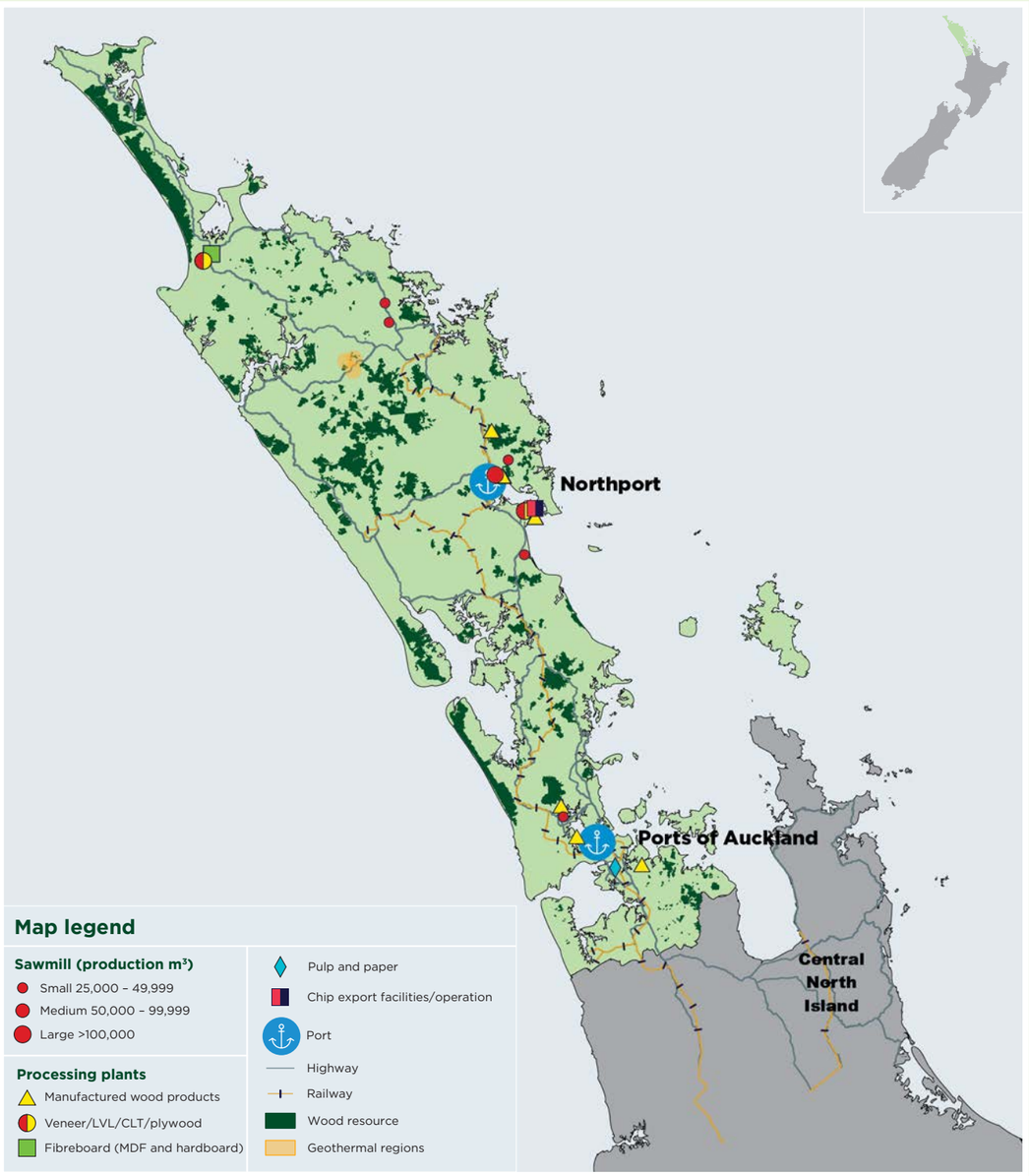
Forest ownership is dominated by the large-scale owners (85 percent) who are able to provide stability of supply to local wood processors. A number of large forest owners have made the decision to halt pruning, leading to an expected decline in future availability of pruned logs over the next decade.

Geothermal energy

The CNI is New Zealand's largest geothermally active region. This energy source offers an attractive competitive advantage to existing and new wood processing operations. The major geothermal fields in Kawerau, Mokai, Ngātamariki, Ohaaki, Rotorua and Wairākei provide direct heat and electricity to neighbouring industrial sites. The Kawerau field is one of New Zealand's largest. As well as power generation, it supplies process steam for an industrial wood-processing site shared by five local mills. The steam is used for drying wood and producing and drying paper and tissue products. The Tauhara geothermal field services two local processors, collectively using some 600 TJ/year of heat energy for kiln drying sawn timber.

NORTHLAND

Wood supply region



Source: Indufor – data as at November 2019.

Wood processing and forestry are well established and important parts of the Northland economy. The region features a diverse range of wood processing facilities and a deep-water port. Northland is well located to supply the nearby Auckland region as well as export markets.

Potential investment opportunities include:

- Utilising lower grade industrial and pulp logs.
- Wood pellets, biofuels, bioplastics or biochemicals.
- CLT and modular housing solutions.
- Potential to work alongside existing processing facilities to provide an innovative solution for refinement of residues.

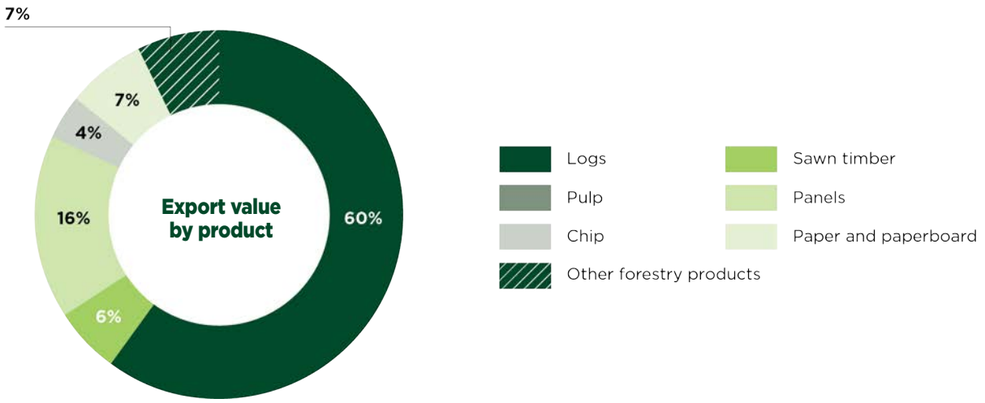
Products and markets

Northland processors manufacture products for export and for the local New Zealand market, and are well located to feed products into the buoyant Auckland construction market. The density profile of the Northland resource has made it an attractive resource for structural lumber as well as structural LVL. The region also hosts an integrated facility comprising a sawmilling and veneer operation and triboard plant. There are a number of sawmills around Northland and Auckland dependent on log supply from the region. Pulpwood markets are largely limited to the demand from the triboard plant and a chip export facility located at the port.

186,000 ha of production forests[4]	**4.3 million cubic metres** annual roundwood harvest[3]	**18*** wood processing facilities	**$435 million** annual log exports[3]	**$354 million** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Combined Northport and Ports of Auckland wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	2,649,066	NZ$	$ 435,351,708
Sawn timber	cubic metres	115,258	NZ$	$ 60,724,764
Pulp	tonnes	1,297	NZ$	$ 1,566,710
Panels				
Fibreboard (incl MDF)	cubic metres	1,765	NZ$	$ 608,130
Particleboard	cubic metres	32,058	NZ$	$ 19,958,962
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 69,504,904
Veneer	cubic metres	81,126	NZ$	$ 29,307,806
Chip	bone dry units	110,691	NZ$	$ 26,539,795
Paper and paperboard	NA	–	NZ$	$ 68,787,770
Other forestry products	NA	–	NZ$	$ 76,893,634

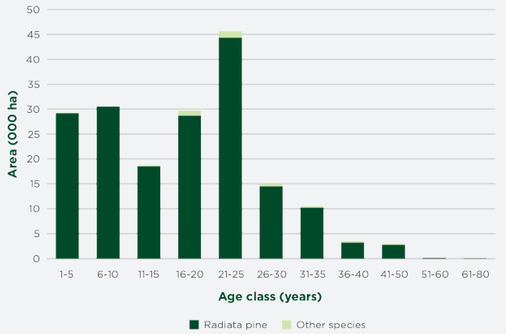
MPI – Data as at 30 September 2019.

Port and transport logistics

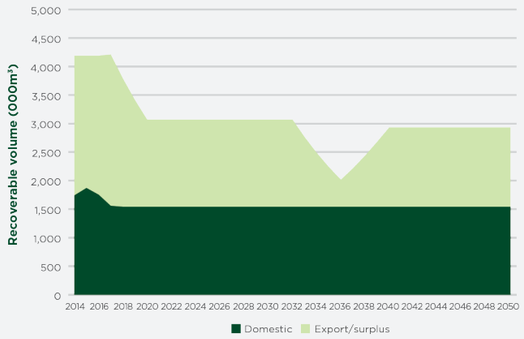
Northport is a deep-water port and Northland's key export facility. It has become a highly efficient log export facility as well as shipping smaller quantities of processed wood products including lumber, panels and chip. There is no current rail access to the Port. However, business case assessments have been undertaken and funding options are being considered.

The Northland wood supply region also encompasses the Ports of Auckland, with access to New Zealand's largest city.

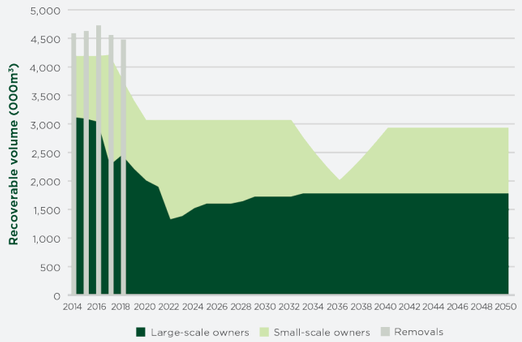
In January 2020 the Government announced $692 million in funding to upgrade State Highway 1 Whangarei to Northport, improving freight connectivity in Northland.



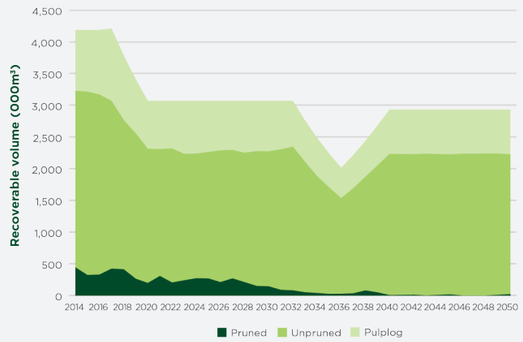
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).

Wood supply

Northland's species mix is heavily dominated by radiata pine. Small areas are covered in Eucalyptus, Douglas-fir and Cypress but are considered to be niche pockets.

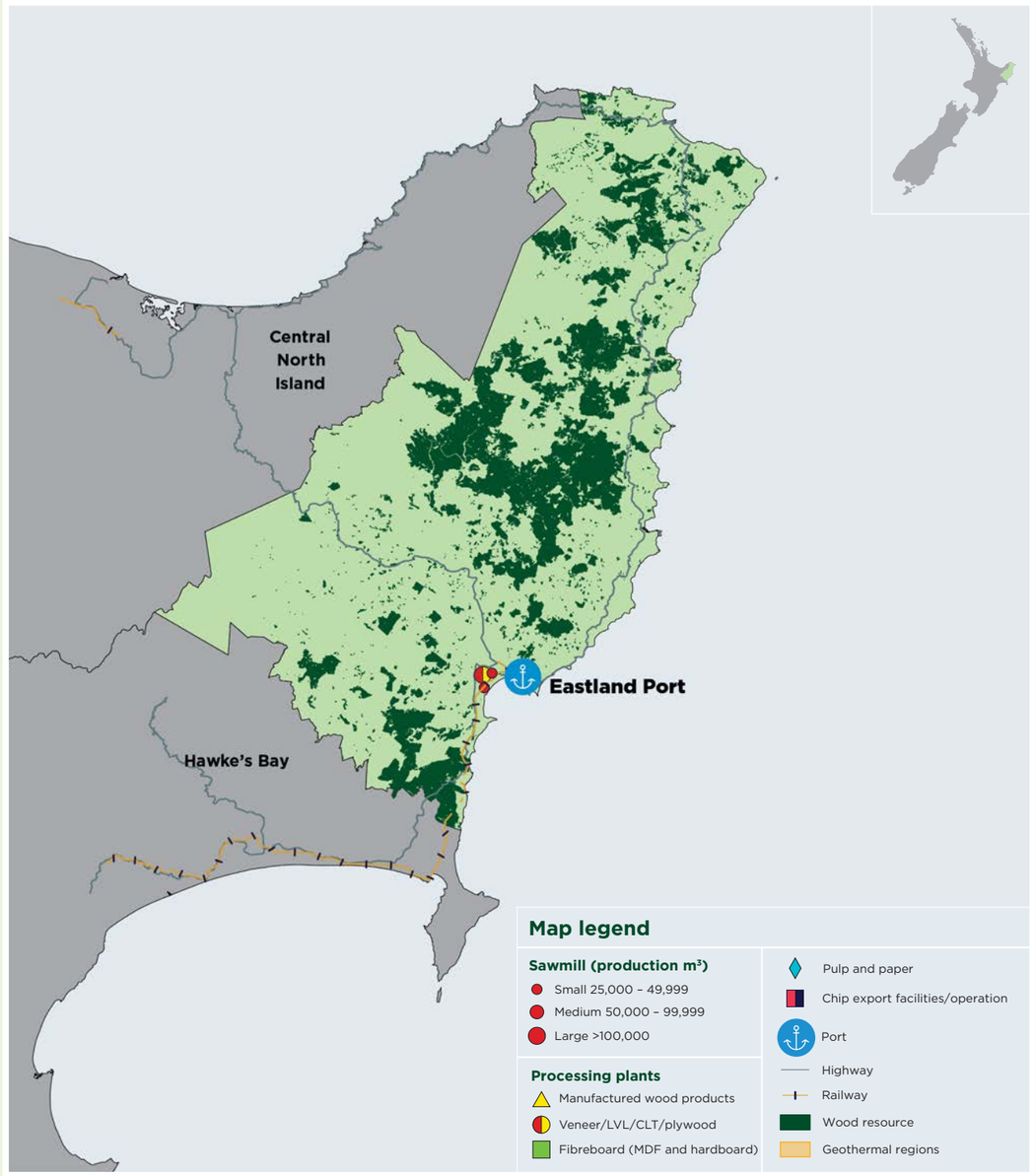
Harvest rates in Northland have been above forecast in recent years and are expected to fall significantly, and at the same time the proportion of small forest owners will also rise. The pruned wood resource in Northland is also forecast to decline to zero by 2032.

These factors present challenges to investors looking to secure long-term quality log supplies for their wood processing operations. There is strong demand in Northland for logs suitable for manufacturing structural lumber grades, so any surpluses are likely to be dominated by utility or industrial type logs, or shorter length structural logs.

The forecast component labelled 'export/surplus' in Northland must be treated with caution. The wood availability forecasts show supply by broad log category and therefore only general comments can be made as to the log mix. It is assumed that the export/surplus will be made up of lower-value industrial and pulp logs.

TAIRĀWHITI

Wood supply region



Source: Indufor – data as at November 2019.

The Tairāwhiti wood supply region offers attractive investment opportunities due to its large forecast supply of logs, and its underdeveloped wood processing sector. Plans to expand Eastland Port and opportunities to increase electricity supply into the region are expected to provide the catalyst for new investment in wood processing export facilities in the region.

Potential investment opportunities include:

- Development of a standalone OSB and/or a combination of a sawmill/particleboard plant or a sawmill/MDF plant.
- Securing current high-density structural export logs for potential LVL, CLT, OEL plants.
- Potential to process mass timber products in Tairāwhiti, most likely for integration into prefabricated, easily stowed structures for export.
- Appearance grade sawmill to take advantage of the high-quality pruned resource.
- Wood modification facility.
- Manufacturing wood pellets, biofuels, bioplastics or biochemicals utilising harvest residues.
- Wood processing aligned with cogeneration of heat and power offers opportunities not only in Gisborne city, but also up the East Coast, as a cornerstone tenant providing electricity and heat for other industrial users.

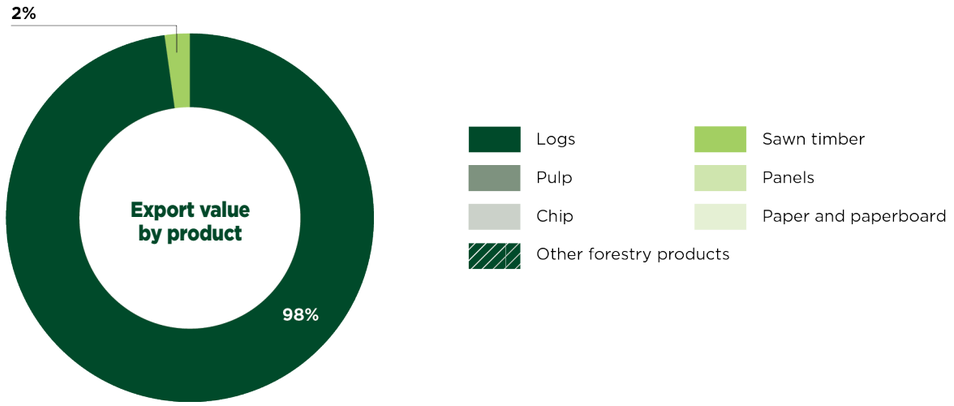
Products and markets

Domestic processing facilities in this region are currently underdeveloped with the only significant processor being an LVL mill and sawmill in Gisborne. There are also several smaller mills including a sawmill and an OEL mill.

156,000 ha of production forests[4]	Roundwood removal information is not available*	**4*** wood processing facilities	**$464 million** annual log exports[3]	**$10 million** annual processed wood exports[3]

*Due to commercial confidentiality issues MPI combined the Tairāwhiti and Hawke's Bay roundwood removals data.
*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Eastland Port wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	2,909,871	NZ$	$ 463,821,662
Sawn timber	cubic metres	42,146	NZ$	$ 9,555,760
Pulp	tonnes	–	NZ$	–
Panels				
Fibreboard (incl MDF)	cubic metres	–	NZ$	–
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	–
Veneer	cubic metres	–	NZ$	–
Chip	bone dry units	–	NZ$	–
Paper and paperboard	NA	–	NZ$	–
Other forestry products	NA	–	NZ$	–

MPI – Data as at 30 September 2019.

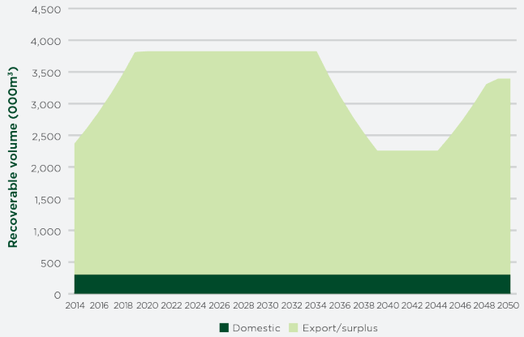
Port and transport logistics

The region is currently looking at ways to alleviate the challenge for containerised wood products having to be transported by road to either the Port of Napier or the Port of Tauranga for export. This will be through expansion of the Eastland Port to include loading coastal container vessels within the next three years.

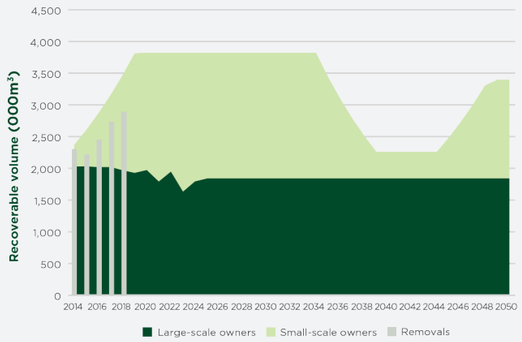
Eastland Port is located in Gisborne and is the region's key export facility. Log export volume from Eastland Port has been growing year on year since 2006 and the port has been at its practical capacity in 2018 and 2019 with volumes topping out at around 3 million cubic metres on the single berth. Eastland Port is in the consenting stages of extending the current wharf to create a twin berth allowing a log ship and container coastal vessel to berth and load concurrently. The extension twin berth project includes further dredging, extending the wharf, reclamation and breakwater repairs.

Rail access is not currently available to the Port. The Napier to Gisborne line was partially restored as far as Wairoa and re-opened in June after a $6.2m grant from the Government. The remaining Wairoa to Gisborne section of the line requires one-off spending of between $20m and $23m to become operational, with another $10m to $13m to improve its resilience to bad weather, and upgrade bridges and tunnels.

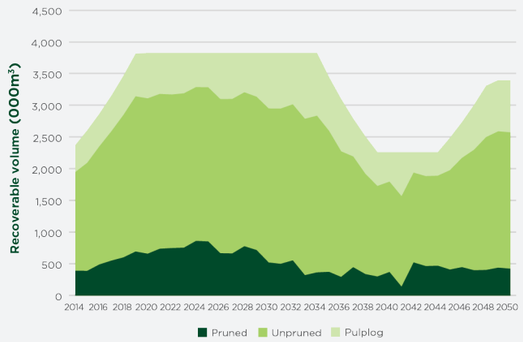
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).

Wood supply

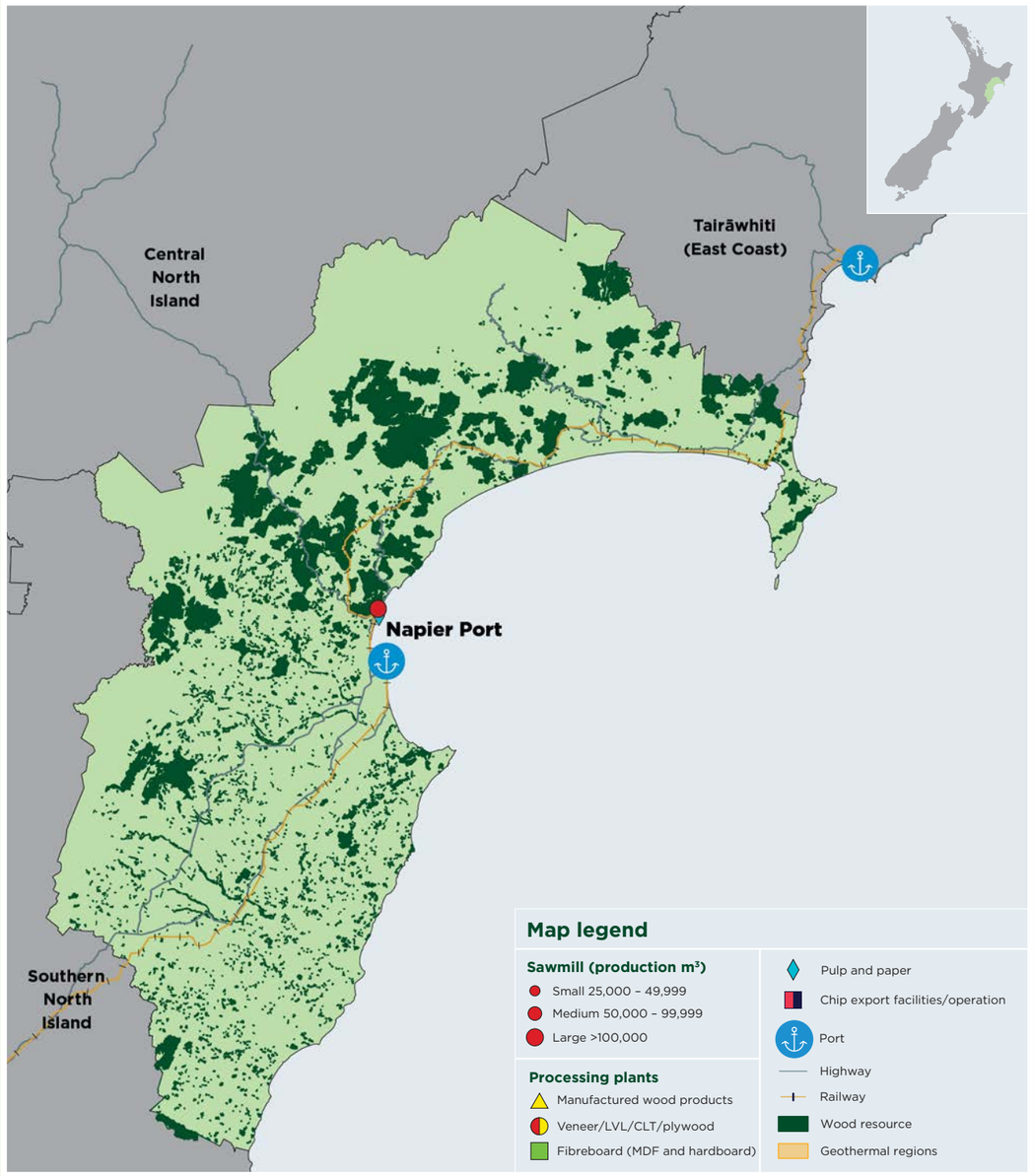
The East Coast region is currently the second largest plantation region in New Zealand on a harvested volume basis, with harvest levels of over 3 million cubic metres per annum.

Wood availability from the East Coast wood supply region's planted forest resource has the potential to increase significantly to 3.5 million cubic metres for the next 15 years. However, it is expected to reduce beyond this point.

Existing infrastructure is at capacity in Tairāwhiti. Large and small forest owners compete heavily for harvesting crews, trucking, road construction and port space which has limited the region's ability to harvest at the target rotation age of the forest owners.

HAWKE'S BAY

Wood supply region



Source: Indufor – data as at November 2019.

The Hawke's Bay wood supply region is well established with a strong export base of diverse wood products and attractive infrastructure to support wood processing investment and expansion.

Potential investment opportunities include:

- Processing mass timber (LVL, CLT, OEL) and export from Napier Port, or integrate into the CNI hub through road and rail network for further refinement.
- Wood processing and cogeneration of heat and power could be established providing electricity and heat for local industry.
- Wood modification facility to take advantage of appearance grade lumber.

Products and markets

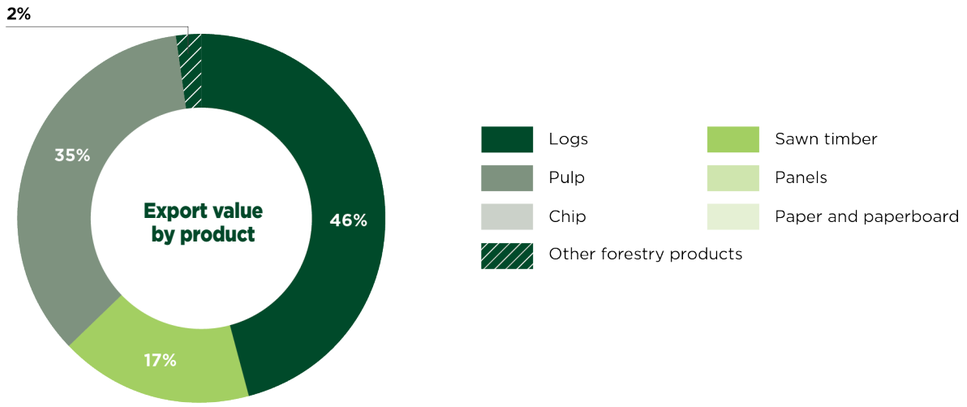
Hawke's Bay sawmilling facilities have a combined intake capacity of approximately 0.8 million cubic metres per annum. A mechanical pulp mill and chip mill also operate in the region with a combined log intake capacity of around 0.55 million cubic metres per annum.

In addition, log and chip export markets are available through Napier Port. A wide range of log grades are currently exported that could be repurposed towards production of engineered wood products such as LVL, CLT, OEL.

132,000 ha of production forests[4]	Roundwood removal information is not available*	**2*** wood processing facilities	**$393 million** annual log exports[3]	**$453 million** annual processed wood exports[3]

*Due to commercial confidentiality issues MPI combined the Tairāwhiti and Hawke's Bay roundwood removals data.
*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Napier Port wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	2,377,312	NZ$	$ 393,300,565
Sawn timber	cubic metres	340,153	NZ$	$ 139,881,433
Pulp	tonnes	453,138	NZ$	$ 293,029,478
Panels				
Fibreboard (incl MDF)	cubic metres	–	NZ$	–
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 2,535,716
Veneer	cubic metres	149	NZ$	$ 151,396
Chip	bone dry units	–	NZ$	–
Paper and paperboard	NA	–	NZ$	$ 192,826
Other forestry products	NA	–	NZ$	$ 16,781,493

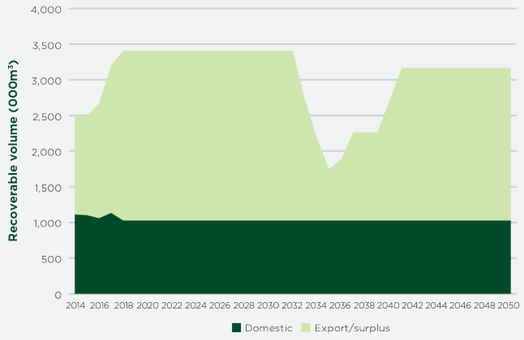
MPI – Data as at 30 September 2019.

Port and transport logistics

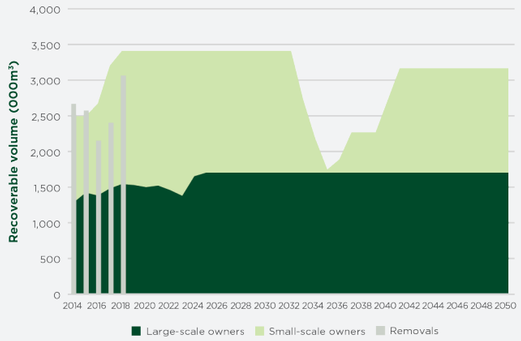
Napier Port is the export hub for Hawke's Bay. Its convenient location and strong supply chain efficiencies also attracts cargo from the Central North Island and Southern North Island. Five million one hundred thousand tonnes of cargo are currently exported from Napier Port.

The port is currently going through a wharf development to address operational constraints and capitalise on future growth opportunities. This will comprise a new multi-purpose 350 metre length wharf with the ability to handle container ships up to 320 metres in length.

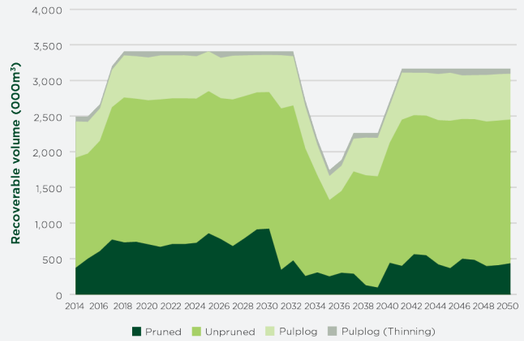
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).

Wood supply

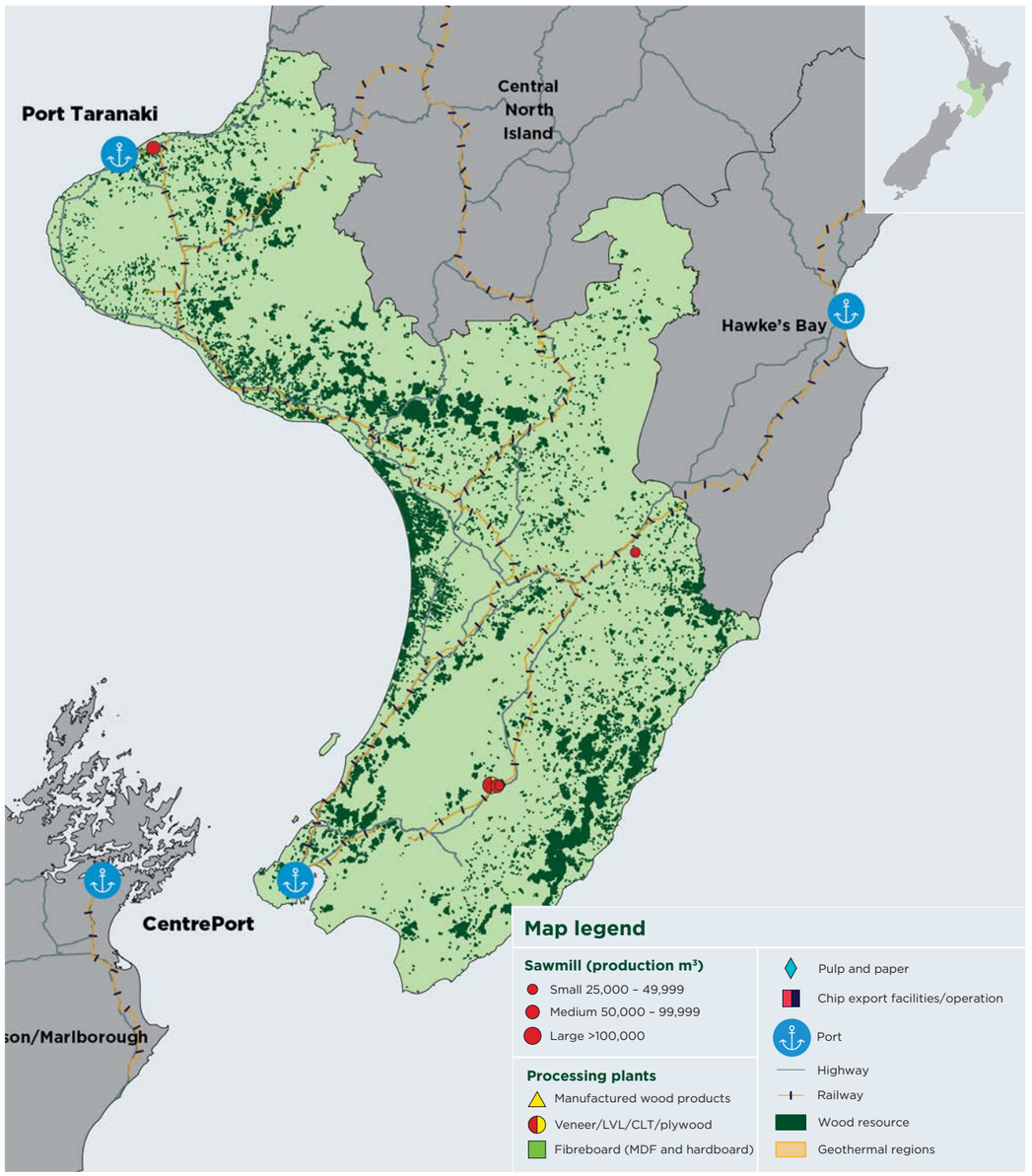
The Hawke's Bay wood supply region is dominated by radiata pine including significant quantities of pruned resource.

Wood availability from the Hawke's Bay wood supply region's planted forest resource is expected to increase in the near future. Harvest levels could reach a sustainable cut of 3.4 million cubic metres for the next decade, followed by a dip in harvest rates during the 2030s.

A significant portion of the potential increase in wood availability from 2015 onwards is forecast to come from the region's small-scale forest owners who established forests during the 1990s. Market conditions and logistical constraints will determine the actual rate of harvest increase, and what level is reached.

SOUTHERN NORTH ISLAND

Wood supply region



Source: Indufor – data as at November 2019.

The Southern North Island (SNI) region features significant underutilised mature wood supply. The region presents investment opportunities to manufacture a range of products from LVL through to bio based products.

Potential investment opportunities include:

- Securing current high-value structural export logs to fuel an engineered wood facility such as LVL or CLT.
- Lower-value grades which are not suitable for export could be processed into biofuels, bioplastics or biochemicals.
- Locate a multi-faceted processing facility in a location such as Whanganui where multiple arterial roads connect with the forest resource.
- Develop an innovative sawmilling solution for alternative species like Douglas-fir and Redwood located in the region's higher rainfall areas.

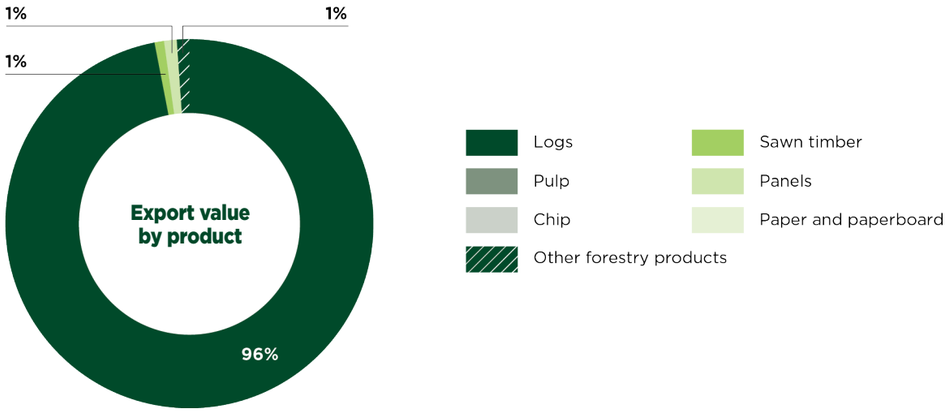
Products and markets

This region has a relatively diverse domestic wood processing sector with sawmilling and LVL capacity of around 840,000 cubic metres per annum, while pulpwood consumption is some 350,000 cubic metres per annum. Export outlets are provided by Port Taranaki (New Plymouth), and CentrePort (Wellington).

160,000 ha of production forests[4]	**3.3 million cubic metres** annual roundwood harvest[3]	**5*** wood processing facilities	**$438 million** annual log exports[3]	**$17 million** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Combined Port Taranaki and CentrePort wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	2,647,486	NZ$	$ 437,557,771
Sawn timber	cubic metres	3,764	NZ$	$ 5,149,714
Pulp	tonnes	–	NZ$	–
Panels				
Fibreboard (incl MDF)	cubic metres	–	NZ$	–
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 4,969,362
Veneer	cubic metres	–	NZ$	–
Chip	bone dry units	–	NZ$	–
Paper and paperboard	NA	–	NZ$	$ 1,912,588
Other forestry products	NA	–	NZ$	$ 4,770,631

MPI – Data as at 30 September 2019.

Port and transport logistics

Port Taranaki is centrally located in New Plymouth and is the only deep-water seaport on New Zealand's West Coast. Port Taranaki can handle a wide diversity of cargoes, with a focus on bulk products (both wet and dry) and project cargo.

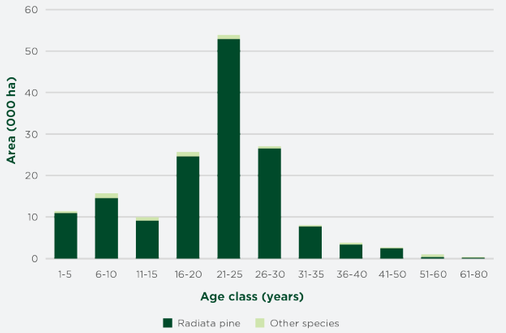
CentrePort is located in Wellington's Harbour and is the gateway for product to move in and out of New Zealand's capital city. CentrePort has an international cruise terminal, state-of-the-art cold store, container repair and storage depot, specialised container packing and unpacking service, and facilities equipped to handle and store specialist cargoes such as bulk powders, forestry products, fresh produce and bulk liquids, including chemicals and petroleum.

Both ports benefit from rail access. The CentreRail service to CentrePort is a scheduled daily train service which links key trade areas in the lower North Island and upper South Island.

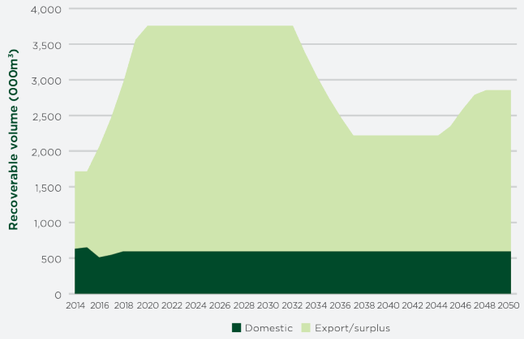
The service is available to all export and import customers regardless of size, location or commodity. Rail movement of logs has also recently returned to the Port of Taranaki.

The Port of Napier is also a significant export centre for logs from the region due to the available rail links connecting the southern Hawke's Bay and Wairarapa.

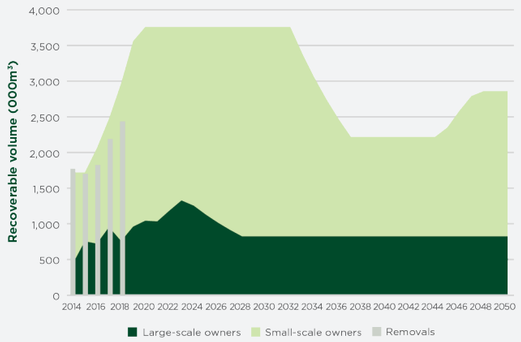
Palmerston North is a key distribution hub for the North Island, with significant investment from local and central Government planned in the short to medium term. This hub will link road, air and rail freight, creating a significant regional freight hub for New Zealand, leveraging the central location of Manawatu and improving national efficiency in moving freight.



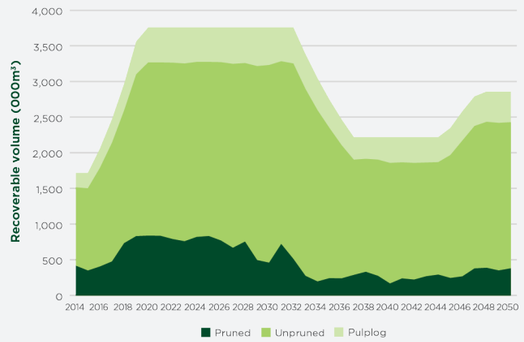
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts Scenario 4a (target rotation age of 26 years).

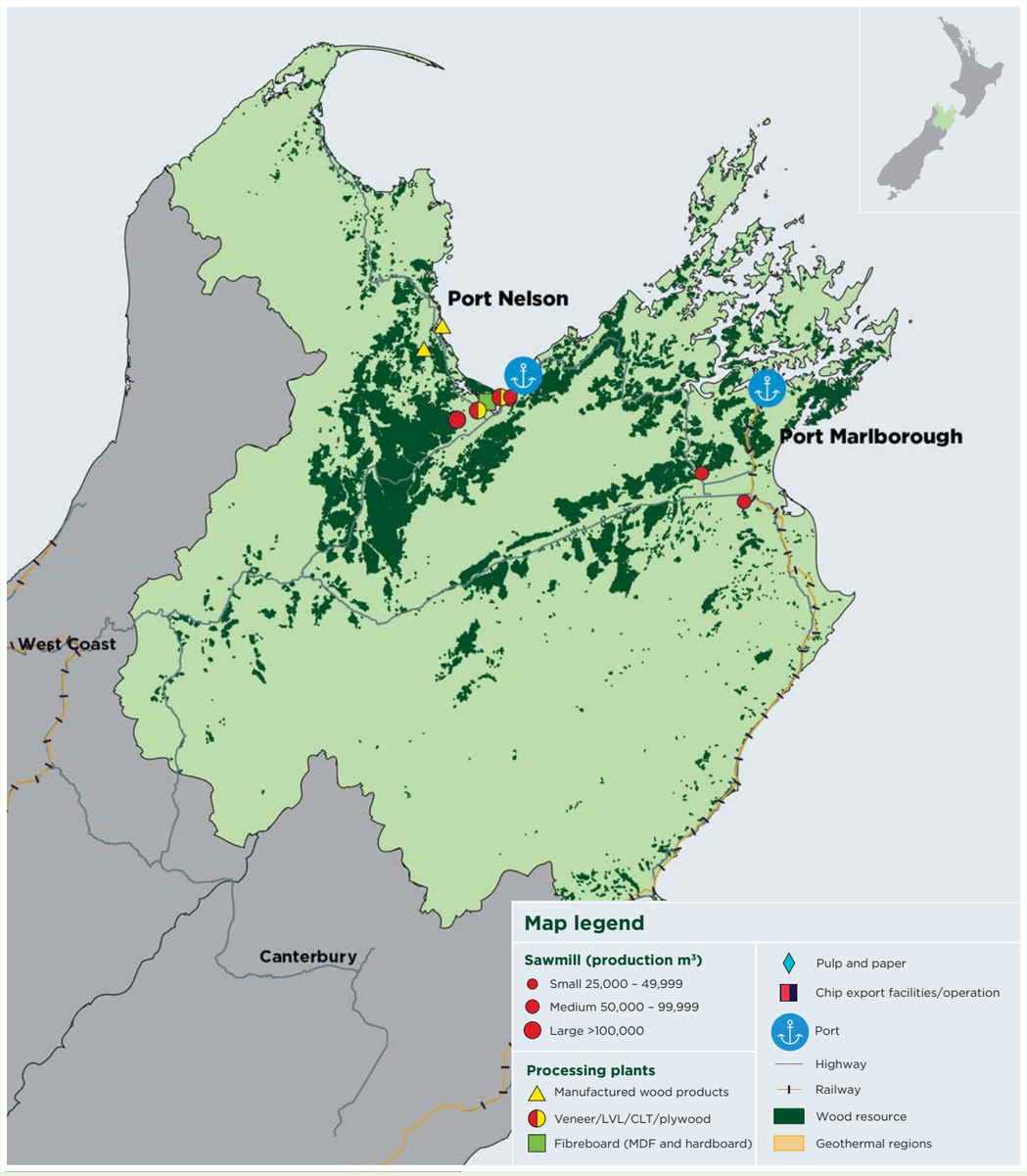
Wood supply

The wood availability from the SNI has the potential to increase from current levels of around 2.4 million cubic metres per annum to 3.7 million cubic metres per annum over the next decade.

A large proportion of the potential increase in wood availability is forecast to come from the region's small-scale forest owners who established forests during the 1990s. Market conditions and logistical constraints will determine the actual rate of harvest increase, and what level is reached.

NELSON AND MARLBOROUGH

Wood supply region



Source: Indufor – data as at November 2019.

Nelson and Marlborough are established wood supply regions that host two regional ports and a diverse range of wood processing facilities. Potential investment opportunities include increased structural lumber production, CLT and use of residues for bio based applications.

Potential investment opportunities include:

- Establishing this region as the sister wood product innovation hub to one in CNI.
- Investing in growing and repurposing mills to switch from appearance grade to structural grade lumber products.
- Focusing on engineered wood products (eg CLT) and remanufacturing.
- Manufacturing wood pellets, chip, biofuels and chemicals from residuals created by existing wood processing facilities.

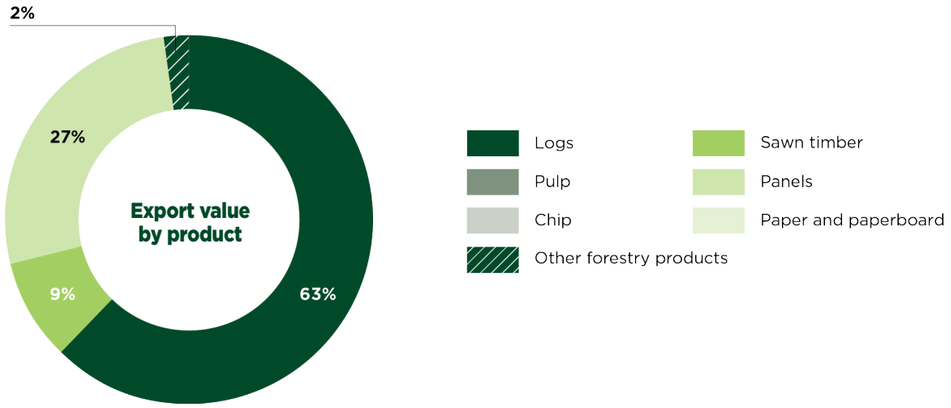
Products and markets

Within the Nelson and Marlborough region there are eight wood processing facilities comprising six sawmills, an MDF and LVL plant, and a remanufacturing facility. The combined log input capacity is estimated at 1.4-1.5 million cubic metres with the bulk of this located some distance away in the Nelson area.

165,000 ha of production forests[4]	**3.4 million cubic metres** annual roundwood harvest[3]	**8*** wood processing facilities	**$283 million** annual log exports[3]	**$168 million** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Combined Port Marlborough and Port Nelson wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	1,895,073	NZ$	$ 283,365,580
Sawn timber	cubic metres	95,065	NZ$	$ 39,914,352
Pulp	tonnes	–	NZ$	–
Panels				
Fibreboard (incl MDF)	cubic metres	200,446	NZ$	$ 102,947,167
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 16,388,424
Veneer	cubic metres	447	NZ$	$ 451,841
Chip	bone dry units	–	NZ$	–
Paper and paperboard	NA	–	NZ$	$ 12,767
Other forestry products	NA	–	NZ$	$ 8,397,403

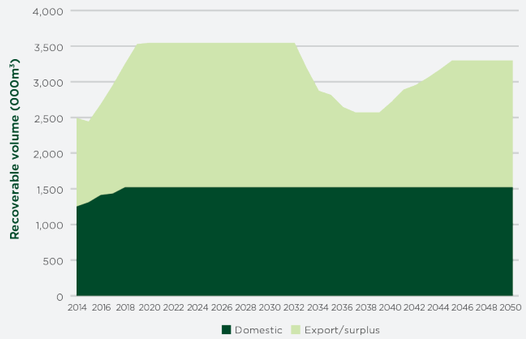
MPI – Data as at 30 September 2019.

Port and transport logistics

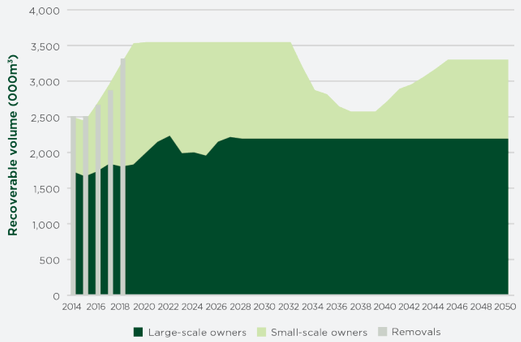
Port Marlborough is an extensive port facility servicing a variety of vessels from bulk log carriers and cruise liners to other vessels. The log handling terminal (Waimahara) is located in Shakespeare Bay and is serviced by road and rail link from the main Picton facility. The Port Marlborough authorities have recently dredged around the Waimahara port to accommodate larger vessels.

Port Nelson is also an extensive port facility servicing a variety of vessels including bulk log carriers, container vessels, cruise liners and a variety of other smaller vessels. Log handling and loading is mainly done through Kingsford Quay and McGlashen Quay, though log storage is scattered in pockets through the terminal facility. It is serviced by road.

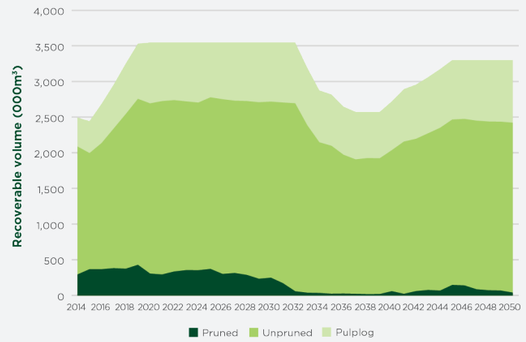
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).

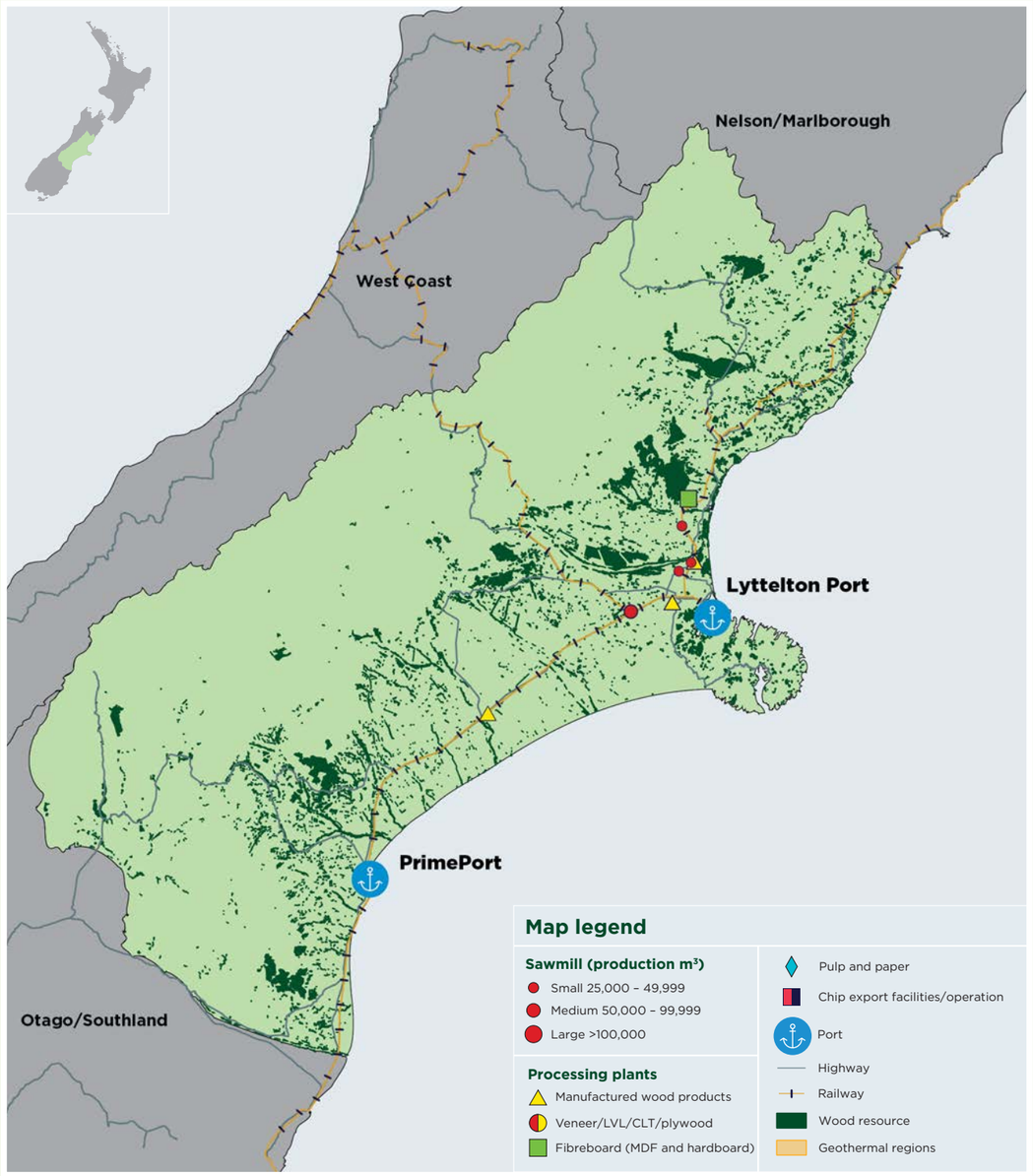
Wood supply

Harvest levels in the combined region are around 3 million cubic metres per annum with around half of that coming from Marlborough. Compared to other regions in New Zealand, forecast harvest levels show only a moderate increase to 3.5 million cubic metres per annum (steady at 1.5 million cubic metres in Marlborough). A large proportion of the potential increase in wood availability is forecast to come from the region's small-scale forest owners who established forests during the 1990s.

A forecast decline in the availability of pruned logs is apparent after 2019, along with an increase in the volume of structural, utility and pulp logs.

CANTERBURY

Wood supply region



Source: Indufor – data as at November 2019.

The Canterbury wood supply region has access to both radiata pine and Douglas-fir wood resources. The region has established sawmilling and MDF operations and has access to two export ports.

Potential investment opportunities include:

- Refinement of residues created by the existing industry.
- Export biofuels or biochemicals via Lyttelton Port.
- Work alongside existing processing facilities to provide an innovative sawmilling solution for the region's Douglas-fir resource.

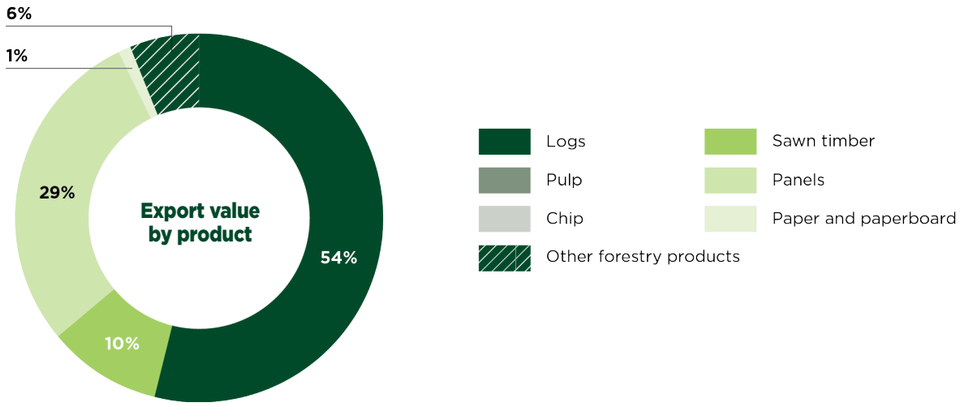
Products and markets

The Canterbury region is well serviced by local wood processing plants. These plants are spaced across the region with locations including a large sawmill in Rolleston, a remanufacturing operation and MDF moulding plant in Christchurch and MDF plant located in Rangiora.

95,000 ha of production forests[4]	**1.8 million cubic metres** annual roundwood harvest[3]	**8*** wood processing facilities	**$172 million** annual log exports[3]	**$149 million** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood products.

Combined Lyttelton and PrimePort wood exports



Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	985,940	NZ$	$ 171,560,599
Sawn timber	cubic metres	71,158	NZ$	$ 31,850,599
Pulp	tonnes	1,456	NZ$	$ 398,444
Panels				
Fibreboard (incl MDF)	cubic metres	163,347	NZ$	$ 92,347,944
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	$ 92,154
Veneer	cubic metres	–	NZ$	–
Chip	bone dry units	–	NZ$	–
Paper and paperboard	NA	–	NZ$	$ 4,450,459
Other forestry products	NA	–	NZ$	$ 19,821,797

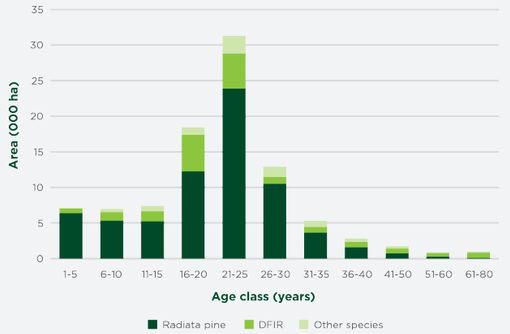
MPI – Data as at 30 September 2019.

Port and transport logistics

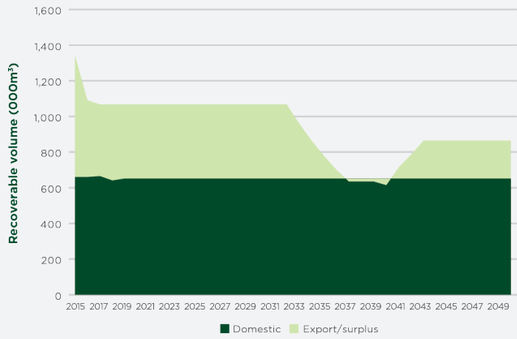
Lyttelton Port is the largest port in the South Island, linking multiple inland port facilities with the terminal in Lyttelton. Port facilities are provided for loading and unloading bulk products such as petroleum, fertiliser, gypsum, cement, logs, conventional break-bulk, imported vehicles and fish. Lyttelton is a net importer of containerised goods and an opportunity exists for container exporters to procure subsidised freight to overseas markets by chartering containers that would have otherwise been shipped empty.

PrimePort is located in Timaru, South Canterbury. Port facilities are provided for loading and unloading of containers, heavy lift or project cargo, cement, logs, fish, fertiliser and stock feeds as well as other dry bulk product.

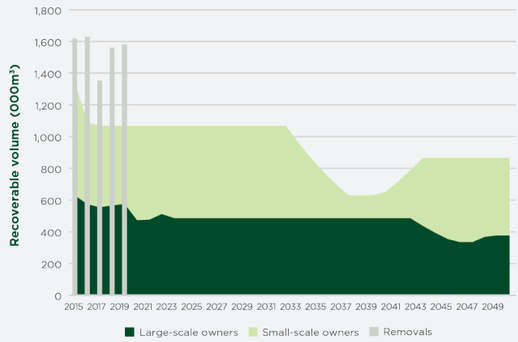
Both ports are serviced by well-established road and rail links.



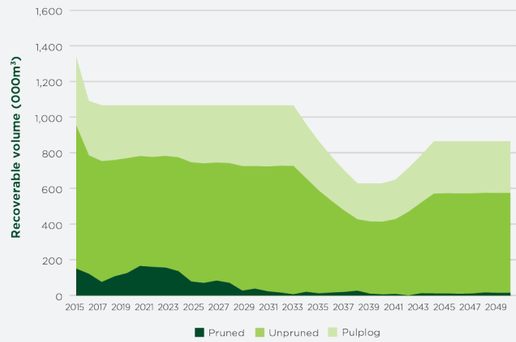
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 4a (target rotation age of 26 years).

Wood supply

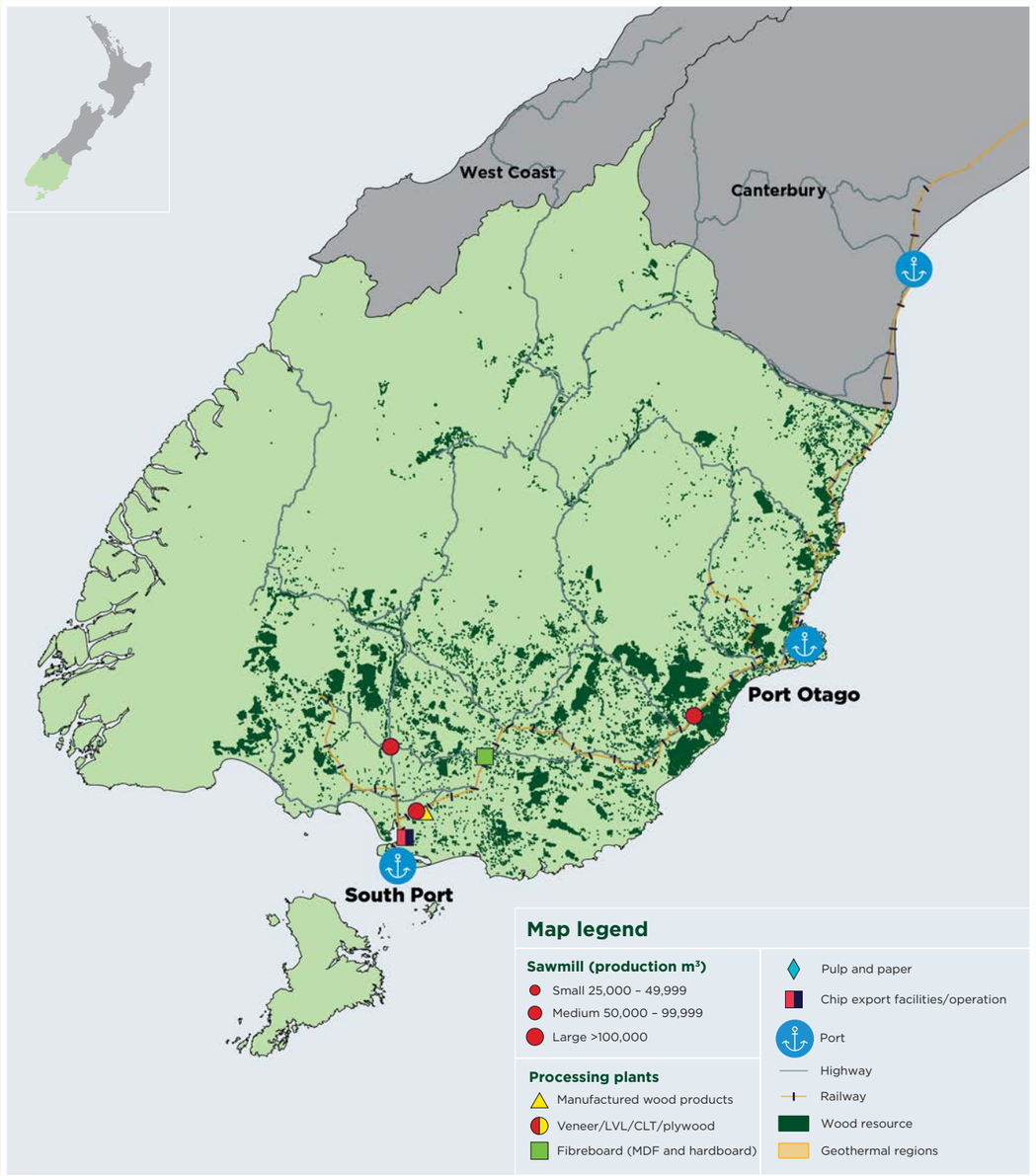
Compared to most of the New Zealand wood supply regions, Canterbury has a high proportion of Douglas-fir, at 20 percent of the plantation resource. From the 2020s, this species contributes 150,000–250,000 cubic metres per annum to the regional wood availability.

Current levels of harvesting are much higher than expected, suggesting that harvest levels will need to reduce well below one million cubic metres per annum to achieve a sustainable cut.

Over the long term around 55 percent of the ongoing Canterbury wood supply will come from the region's small-scale forest owners. However, this ratio has the potential to be much higher during the 2020s (up to 75 percent) should market conditions and logistical constraints permit.

OTAGO AND SOUTHLAND

Wood supply region



Source: Indufor – data as at November 2019.

The Otago and Southland region hosts New Zealand's most diverse production forests, offering wood processing investors multiple options for wood supply and product manufacturing. Processors also have access to both export and deep-water ports.

Potential investment opportunities include:

- Appearance grade engineered lumber (such as exposed glulam or veneered plywood) or remanufactured products.
- Refinement of lower-value pulp logs not suitable for export into biofuels, bioplastics or biochemicals. Aim to integrate residues created by the existing industry into this plant.
- Work alongside existing processing facilities to provide an innovative sawmilling solution for the region's Douglas-fir resource.
- Investigate alternative uses for Eucalyptus grown in Southland.

Products and markets

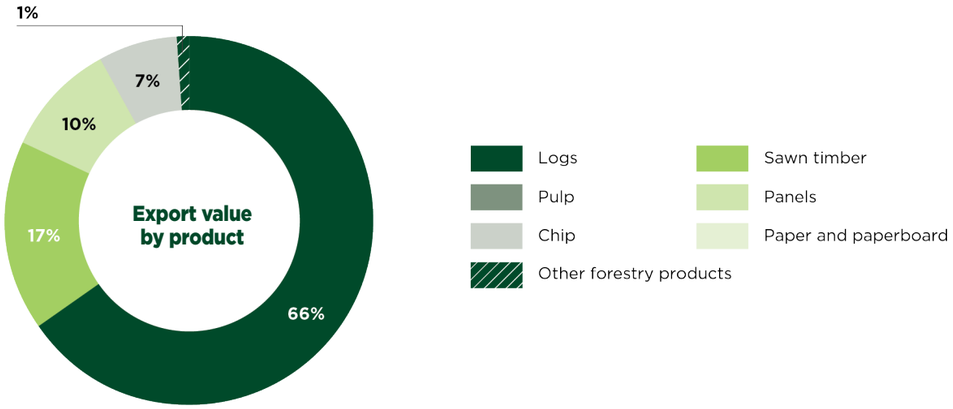
The Southland region hosts two large sawmilling facilities. Otago features one large sawmill located in Milburn. The majority of lower-value pulp wood is sold to the local MDF plant. There are also a number of other smaller domestic sawmilling options scattered across Otago and Southland.

The region has a hardwood chip export facility operation that processes Eucalyptus logs. Other outlets for pulp and low-grade logs include a wood chip business in Naseby.

211,000 ha of production forests[4]	**3.0 million cubic metres** annual roundwood harvest[3]	**5*** wood processing facilities	**$319 million** annual log exports[3]	**$164 million** annual processed wood exports[3]

*A minimum size for inclusion of wood manufacturing on this map is operators producing >20,000 cubic metres finished wood product.

Combined Port Otago and South Port wood exports



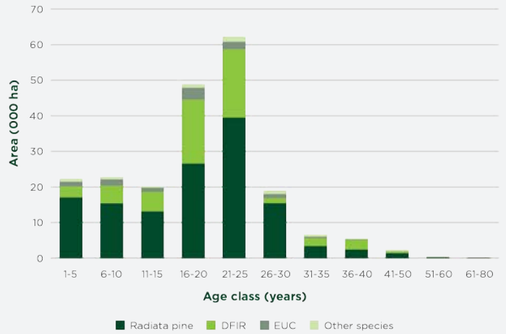
Product	Unit	Volume	Unit	Value (FOB)
Logs	tonnes	1,882,808	NZ$	$ 319,324,892
Sawn timber	cubic metres	216,266	NZ$	$ 79,827,816
Pulp	tonnes	849	NZ$	$ 478,610
Panels				
Fibreboard (incl MDF)	cubic metres	108,493	NZ$	$ 46,904,922
Particleboard	cubic metres	–	NZ$	–
Plywood (incl LVL/CLT)	NA	–	NZ$	–
Veneer	cubic metres	–	NZ$	–
Chip	bone dry units	136,321	NZ$	$ 32,776,898
Paper and paperboard	NA	–	NZ$	$ 668,464
Other forestry products	NA	–	NZ$	$ 3,454,213

MPI – Data as at 30 September 2019.

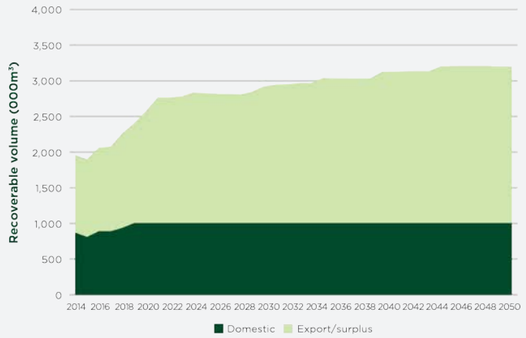
Port and transport logistics

Port Otago is the primary export port for the lower half of the South Island. The port is complemented by the Otago region's excellent transport, warehousing and cool store infrastructures. Port Otago is split between the Port Chalmers deep-water container, cruise-line and bulk freight facility and the draft restricted Dunedin CityPort. Port Otago has two dedicated rail services, which run between Timaru and Port Chalmers, and Southland (Invercargill, Clifton, Bluff) and Port Chalmers.

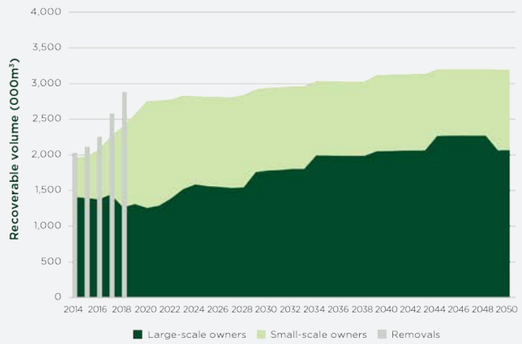
South Port, located in Bluff Harbour, is New Zealand's southernmost deep-water port. South Port provides a full range of marine services, cargo and container shipping and on-site warehousing for domestic and international customers. South Port's customers import and export aluminium, logs, fish, dairy, meat, wood chips, stock food, cement, alumina, fertiliser and petroleum products. South Port's Intermodal Freight Centre offers customers a 4,000 square metre warehouse with a rail connection servicing the Otago and Southland regions.



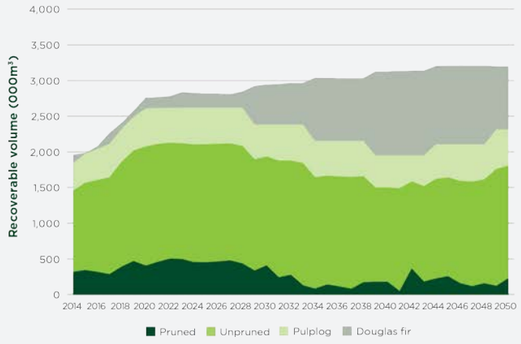
Source: 2019 National Exotic Forest Description (NEFD).



Source: 2014 MPI Wood Availability Forecasts
Scenario 6 (Radiata and Douglas-fir joint forecast).



Source: 2014 MPI Wood Availability Forecasts
Scenario 6 (target rotation age of 26 years).



Source: 2014 MPI Wood Availability Forecasts
Scenario 6 (Radiata and Douglas-fir joint forecast).

Wood supply

Otago and Southland is home to the most variable exotic species mix in New Zealand, large areas of radiata pine, Douglas-fir, Eucalyptus and minor softwood species like Cypress are prevalent across the wood supply region. The wood-flow availability forecast provided includes Douglas-fir since this species makes up a large proportion of annual volume from the late 2020s onwards.

The annual radiata pine harvest level has the potential to vary between 1.5 million cubic metres and 2.7 million cubic metres, depending on harvest age. Of this, approximately 1.0 to 1.7 million cubic metres will be potentially coming from Otago, and around 0.5 to 1.0 million cubic metres from Southland. Most of the potential increase in wood availability will come from the region's small-scale forest owners who established forests during the 1990s. Market conditions and logistical constraints will determine the actual rate of harvest increase, and to what level is reached.

GET IN TOUCH – NEXT STEPS FOR INVESTORS

Now is the perfect time to invest in New Zealand's wood processing sector. The New Zealand Government is working to actively facilitate investment into new wood processing projects, and stands ready to help.

For qualifying investors interested in new wood processing opportunities and developments, the New Zealand Government can:

Identify market opportunities by providing detailed information on forest resources, wood processing, domestic and export market dynamics, and emerging New Zealand wood-based bioeconomy trends.

Direct investors to specific investment opportunities by granting them access to regional sponsors, existing market participants seeking expansion capital, and new greenfield opportunities.

Facilitate introductions with key private sector parties to help new market entrants secure the right expertise for developing high-value wood processing projects in New Zealand.

Provide introductions to key central and local government agencies to connect investors to the local support ecosystem and help them understand any incentives available to encourage sector development.

New Zealand Government collaborating agencies

New Zealand Trade and Enterprise (NZTE)

NZTE is the New Zealand Government's international business development agency, and focusses on helping companies grow internationally – bigger, better, faster – for the good of New Zealand.

NZTE is also the Government's investment agency, helping investors to identify opportunities and build partnerships in New Zealand. With approximately 50 offices worldwide, NZTE can often provide a local point of contact in your region.

Ministry for Primary Industries (MPI)

MPI focusses on developing export opportunities for New Zealand's primary industries, improving sector productivity, ensuring the food we produce is safe, increasing sustainable resource use, and protecting New Zealand from biological risk. MPI has more than 2,900 staff working in over 60 locations in New Zealand and worldwide.

Te Uru Rākau (Forestry New Zealand)

Te Uru Rākau is the forestry business unit within MPI, and leads the ongoing development, growth, and management of New Zealand's forestry sector.

READY TO INVEST?

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Glossary

CLT	Cross-laminated timber
CNI	Central North Island
FSC	Forest Stewardship Council
IP	Intellectual property
LVL	Laminated veneer lumber
MDF	Medium density fibreboard
MPI	Ministry of Primary Industries
NZTE	New Zealand Trade and Enterprise
OECD	The Organisation for Economic Cooperation and Development
OEL	Optimised engineered lumber
OIO	Overseas Investment Office
OSB	Oriented strand board
PEFC	Programme for the Endorsement of Forest Certification
SNI	Southern North Island
Tairāwhiti	Gisborne/East Coast region

Map (page 12)**: Estimated roundwood removals by wood supply region**

All data as at March 2019.

Northland log export data is based on North Port and Port of Auckland.

Central North Island log export data is based on Port of Tauranga.

Tairāwhiti and Hawkes Bay log export data is based on Eastland Port (Gisborne) and Port of Napier.

Southern North Island log export data is based on Port Taranaki and CentrePort (Wellington).

Nelson and Marlborough log export data is based on Port Nelson and Port Marlborough.

Canterbury log export data is based on Lyttelton Port and Port of Timaru.

Otago and Southland log export data is based on Port Otago and South Port (Invercargill).

West Coast export data is not available as exports are railed out of the region, mainly to Canterbury.

Endnotes/References

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14. **BlackRock** – BlackRock Sovereign Risk Index, October 2019, https://www.blackrock.com/americas-offshore/resources/tools/blackrock-sovereign-risk-indicator

NEW ZEALAND

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