

# Log export markets and their log requirements

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## Introduction

Log exports have been part of the New Zealand industry's product and market mix since the late 1950s. The main purpose at that time was to earn superior returns to those available in the domestic market, which was under price control. Some of these earnings were used to fund industrial development such as upgrading and expanding pulp and paper mills and for forest development. Log export markets were also beneficial in times of supply surges such as after wind throw, during shut downs at major plants or down cycles in domestic demand.

As the forest harvests increased the industry became dependent on log export markets for consuming the excess volume that could not be processed domestically. This was less a reflection on the state of domestic processing than on the rapid growth in wood availability due to the planting booms of the late 1960s and 1970s. Log exports also offered owners a diversity of markets and transparent pricing which attracted overseas investment into forest ownership.

The relationship between log exporters and domestic processors is not always without tension. This becomes evident when domestic and export markets are at different stages in the price cycle. However as they follow different demand patterns, log exports have helped to dampen price volatility and offer forest owners steadier income streams.

Because of these benefits and the ability to quickly establish a significant presence for radiata pine, log exports should be treated strategically as any other product in the industry's market portfolio, especially for logs that cannot be processed competitively in New Zealand. Processors should not regard these markets to be in competition with them. Rather, armed with the knowledge of our logs are used and consumed in overseas markets, processors should find that they are better able to identify the products and markets in which New Zealand industry has real competitive advantage.

## Asia's import demand for logs

Logs are an internationally traded commodity. Total global trade in 2002 was estimated to be about 118 million m<sup>3</sup>. Europe was the largest

importing region, with 52 million m<sup>3</sup> imported by constituent countries. Most of the trade was conducted within the region although 17 million m<sup>3</sup> came from Russia, which is well placed to benefit from European demand due to its relative proximity particularly to Scandinavian countries (see Table 1).

Table 1: Global trade flows in logs for 2002

	Millions m <sup>3</sup>	Imports				Total
		Russia	Europe	N America	Asia	
Exports	Russia		17		20	37
	Europe	1	37			38
	N America			9	5	14
	Asia				16	16
	Africa		2		3	5
	Oceania				8	8
	Total	1	56	9	52	118

Source: FAOSTAT (2004)

Asia was the next largest log trading region, importing 49 million m<sup>3</sup> in 2002. Trade within Asia was 16 million m<sup>3</sup>, while 20 million m<sup>3</sup> came from Russia, 8 million m<sup>3</sup> from Australia and New Zealand, 5 million m<sup>3</sup> from North America and 3 million m<sup>3</sup> from Africa. North America was the third largest region importing 9 million m<sup>3</sup> of logs. Most of the trade was cross-border between Canada and the U.S. Due to its proximity and size, Asia remains the largest export market for New Zealand logs.

## New Zealand log exports

Log exports have grown steadily for well over 10 years, interrupted by the Asian crisis in 1997-8. In 2003 exports again suffered a slight downturn due to difficult supply conditions. The major long term trend has been one of declining Japanese demand for New Zealand logs, which however has been more than offset by demand growth in China.

For 2003, Korea accounted for 50% of New Zealand's exports of 7.4 million m<sup>3</sup> (Table 2). China superseded Japan as the second largest consumer of New Zealand logs, importing 1.6million m<sup>3</sup>. Japan achieved one of the lowest levels of imports for over 10 years, at 1.3 million m<sup>3</sup>. Japan, Korea and China in combination purchased 90% of New Zealand's log exports, or approximately 6.7 million m<sup>3</sup>. Despite strong market development efforts in Southeast Asia, the South Asian sub continent and even the Middle

East, these areas in combination consumed only 10% of our exports.

*Table 2: Main export destinations for New Zealand logs*

	2003 million m <sup>3</sup>	%
Korea	3.7	51%
China	1.6	21%
Japan	1.3	18%
Southeast Asia	0.3	4%
India/Middle East	0.3	4%
Total	7.4	

Source: MAF 2004

The relative importance of North Asian markets is not likely to change significantly over the next 5 years. Log import requirements from Japan, Korea and China therefore will strongly determine the future of the New Zealand log exporting sector.

### Softwood segments by country market

Log consumption in the North Asian markets can be broadly categorized into four segments: packaging, which includes pallets, cable drums, boxing and crates; temporary construction, which includes concrete formwork and civil engineering uses; furniture and fittings, which include windows, doors and mouldings; and plywood.

The number of segments varies for each country. In Japan, demand for New Zealand logs is restricted to the packaging and plywood segments, while in Korea demand comes also from temporary construction. In China the main segments are furniture and fittings, plywood and temporary construction, and to a lesser extent packaging.

Table 3 shows approximate volumes of New Zealand logs processed in each of the segments in 2003. Korean temporary construction and plywood were the largest segments, consuming 50% of New Zealand's total log exports.

*Table 3: New Zealand radiata pine log consumption by market segment for 2003*

Country	Segment	(000 m <sup>3</sup> )
Japan	Plywood	500
	Packaging	800
Korea	Plywood	1,000
	Packaging	300
	Temporary construction	2,400
China	Plywood	900
	Packaging	100
	Temporary construction	200
	Furniture	400
Total		6,600

Source: Silva estimates

### Japan Packaging

The packaging industry has been detrimentally affected by a long period of economic stagnation and relocation of its main customers to lower manufacturing cost countries. In addition the industry faces competition from Chilean and domestic lumber. The squeeze from declining demand has provided little incentive to invest in this industry. The only recent major investment has been in shipping in an effort to control costs and service delivery. The market for logs will remain limited for the foreseeable future and is more likely to contract as further rationalisation takes place.

End users still demand attractive quality packaging and so demand for the traditional Japan 'A' grade remains, a log of medium to large diameter with knots up to a medium size (12cm). It is one of the few markets where a significant price premium on long lengths can be achieved. Log specifications for this and other segments are given in Table 4 (see opposite page).

### Plywood

Japan plywood manufacturers produce plywood for both temporary and permanent construction. During the 1970s and 1980s the plywood industry consumed only tropical hardwood logs, serving a market exceeding 7 million m<sup>3</sup> of product making it one of the largest in the world at that time. With the expansion of Indonesian plywood production in the early 1990s, and the increasing cost of hardwood logs, the Japanese producers started to substitute with softwoods in an effort to control costs and remain competitive against imports. The switch was deliberate and strategically executed and is still continuing, taking place over a period of over 10 years.

As in other parts of the world, the most competitive resources available were the Russian forests with their abundance of small diameter logs. Larch was competitively priced and produced high strength veneers, which were particularly suitable for face and back. However Russian supply was notoriously unreliable and inconsistent, and smaller diameter radiata pine with medium-sized knots proved to be an acceptable alternative for plywood core. Radiata produces veneers of lower stiffness due to its inherent fibre characteristics and larger knot size. Recently the cost advantage of radiata pine over Russian larch has decreased to the point that it could be assumed that radiata pine could find itself squeezed out of the market. However the Japanese industry is loath to drop radiata pine as it is easy to peel, mitigates risks from the less reliable Russian larch supply, and has ready market acceptance.

Table 4: Size and quality requirements by country segment

Country	Segment	Sed range	Maximum knot size	Market grades	Lengths
Japan	Plywood	20cm +	10cm	J	4m
	Packaging	30cm+	12 cm	A	4m, 6m, 8m, 12m
Korea	Plywood	20cm–35cm 30cm +	10cm 12cm	K A	3.9m, 4.5m, 5.1m, 5.8m, 7.7m
	Packaging	16cm – 22cm 20cm – 35cm	10cm 10cm	K small K	3.0m, 3.3m, 3.6m, 5.4m
	Temporary construction	16cm–22cm 20cm–35cm 26cm +	10 cm 10 cm Unlimited	K small K KI	3.6m, 7.3m, 11.0m
	Plywood	10cm+ 20cm–35cm 30cm +	Unlimited 10 cm 12–15 cm	Pulp K A	3.8m, 3.9m
China	Packaging	20cm +	10 cm	K	4.0m
	Temporary construction	30cm + 26cm	12cm Unlimited	A KI	3.9m
	Furniture & fittings	26cm+ 30cm + 40cm + 35cm+	Unlimited 12cm 12cm —	KI A Large A Pruned	3.9m

## Korea

### Temporary construction

Temporary construction is the largest end use for timber in Korea, and is dominated by radiata pine. Radiata is mainly used as joists and bearers for concrete formwork. Its advantage is that it is easy to cut and nail, the logs are cut to length, and it is relatively inexpensive. Its disadvantage is that it breaks and shatters with use and has to be frequently replaced.

To extend the timber's life, bearers are sometimes covered by a plastic sheath. Steel has made large inroads into this market, particularly as bracing for plywood panels, in joists and as upright supports. LVL is also a potential substitute for solid wood, particularly for bearers. LVL has the advantage that it is stronger, allowing a reduction in the number of joists and vertical steel supports. LVL can also be re-used more times than solid timber, long enough to see it through most construction projects.

In civil engineering uses, the main application of radiata pine is for temporary walling in road and tunnel construction. The main requirement is for large dimensional timber which is only used once. Demand is very price sensitive. Most of the log demand is for KI grade.

### Packaging

The packaging industry in Korea manufactures pallets, boxes and crates. Korea used to be a major producer of cable drums for European markets,

however this market has been taken over by China. More recently spruce, both from Alaska and from Russia has made inroads into radiata pine's market share. Spruce has a lower moisture content and in fan-assisted chambers can be dried easily down to the critical level of 18%, which is the requirement for the chemical industry; and even 15% which is the critical level required by the electronics industry. Radiata pine timber has a moisture content of around 35% and can only be dried to the required limits with the use of kilns. Spruce's other advantage is that it suffers less from sapstain, and recently demand also benefited from the rapid rise in price of radiata pine.

Radiata pine however continues to maintain a share of the packaging segment. The advantage of New Zealand logs is that they are available in the required lengths, which include 3.0m, 3.3m, 4.5m and 5.4m, while Russian Spruce is only available in 4m and 6m.

### Plywood

The plywood segment is another large user of radiata pine logs. As in Japan, the Korean plywood industry consumed initially only hardwood logs, but with the increasing cost of Southeast Asian logs, it switched largely to softwoods, specifically radiata pine. They found that radiata pine peeled easily and was sufficiently strong for core material. Most of the plywood is used for concrete formwork.

### China

### **Plywood**

The Chinese Plywood industry is large, probably second only to the United States, with total annual production estimated at around 11 million m<sup>3</sup> of product.

There is a wide range of mill types that process and manufacture plywood. They range from small family units producing 10 m<sup>3</sup> of veneers per day, to factories processing 400,000 m<sup>3</sup> or more of logs per year for a wide range of plywood products.

The major product groups are plywood for partitioning and furniture, which consist of one sheet of core with a face and back, and thick plywood for construction. The partitioning market accounts for about half of the total market and many manufacturers have attempted to use radiata pine for core. However they found radiata pine to be unstable with knots visible through the face veneer. In thicker ply particularly for concrete formwork, radiata pine has found ready use with both pine and hardwoods used for face and backs.

Product quality is unfortunately often poor. In many cases veneers are only air dried affecting gluing performance, and veneer off cuts are recovered for plywood core. This produces lower strength plywood, with low stiffness and higher prospects of delamination. However some manufacturers produce a very good product that has found acceptance in overseas markets. The country has turned around from being a net importer to a net exporter, exporting 2 million m<sup>3</sup> of product in 2003 to other north Asian countries, Europe and the United States.

With the large variety of plywood products and qualities, there is a market for almost any grade and size of radiata pine logs, from small pulp to large diameters, from medium knot size specifications to KI grade logs. A small volume of pruned is used for face and backs. Chinese plywood manufacturing is a low cost, price-sensitive industry which is not willing to pay a premium for higher quality, smaller knot material. The main competition to radiata pine comes from domestic species, such as Mason pine and poplar. As in Japan, there is potential to use Russian larch but to date the costs of shipping and railing have, in most cases, kept this species out of consideration.

### **Construction**

China consumes large quantities of sawn timber for temporary construction, such as the building of dwellings and apartments, infrastructural developments, factories and other commercial buildings. Most of the concrete formwork is very rudimentary, and wood is the predominant material used to support formwork

products. A wide variety of species is used, such as domestic and imported larch, pine and spruce, as well as radiata pine. Mills tend to be small, low cost operations, typically with one or two breakdown saws consuming 500 to 800 m<sup>3</sup> of logs each on a monthly basis. Small mills have the advantage that they can be closer to their customers. In most situations the advantages of short delivery time and proximity to end users are greater than product quality. Therefore mills tend to be small scale serving small geographic markets.

Sawing accuracy is very low. This appears to be acceptable, because cost is the overriding factor and there is not enough value in the product to allow investment into higher quality equipment. Despite the rudimentary nature of processing, recovery factors are reported to be higher than in New Zealand, due to the use of thin saw blades, greater acceptability of wane, and availability of markets for even the smallest sizes.

Sawmillers cut for recovery rather than value and so there are no procedures for lumber grading. The most important log attributes sawmillers seek are low cost, and specifications that allow them to recover their required range with knot sizes that do not lead to excessive product breakage. Species selection is not critical. Domestic Mason pine is eminently suitable although diameters are small and availability is limited. Russian larch, spruce and of course radiata pine are also used.

### **Packaging**

The packaging industry is a small end user of radiata pine. As in Japan and many other countries radiata pine has received a high level of acceptability in the export packaging of manufacturers, particularly for machinery and glass due to its cleanliness and ease of sawing and nailing. However, as elsewhere outside China, most of the packaging markets are very price sensitive and hence the less expensive smaller diameter logs are generally preferred. China still has sufficient supplies of small diameter Mason pine, larch and poplar, which it manages in fast grown plantations. Russian larch is also used. With the wide choice of suppliers, the market is very competitive and radiata pine has tended to be less cost effective.

### **Furniture and fittings**

The rapidly growing furniture and fittings industry, which includes mouldings and millwork items, is arguably the most attractive segment for New Zealand exporters. This segment is not just cost sensitive, but in many cases also species sensitive especially for export. Often pine and even radiata pine is explicitly specified.

The industry has areas of great sophistication producing products to international standards in large scale operations. Some of the large manufacturers consume 5000 m<sup>3</sup> of logs per month. A few have their own sawmills, but more generally they will contract out the processing to a few local mills. The mills are not dissimilar to the ones supplying construction and packaging lumber, except that they also run kilns. Their cost structures are very low and it is difficult for New Zealand sawn timber exporters to compete.

For this segment, value is generated by supplying the right species, large diameters to allow recovery of wide boards with knot patterns that allow recovery of longer length clears. Knot size needs to be limited to medium size, i.e. less than 12 cm. Logs should not contain sapstain, although anti sapstain treatment is not required as they have enough opportunity to hide the sapstain through judicious use of wood. Shippers need to monitor January and February shipments closely, particularly if they come from northern regions.

#### **Future growth**

Despite its long history of importing radiata pine logs, Japanese demand has declined following a long period of economic stagnation and a relocation of its manufacturing industry to lower cost countries. Korea continues to be the key market for log exporters, due to its size, accessibility, and dependence on radiata pine. Prices in Korea have responded most readily to changing New Zealand demand and supply conditions. However despite Korea's position, China has been the real growth area for log export demand. Since 1999 China's requirements for New Zealand logs have increased by 1.4 million m<sup>3</sup>. The main drivers have been declining domestic supply, strong construction activity and growth in the furniture and fittings industry. With continued strong economic growth, demand in China for New Zealand pine logs is likely to increase.

#### **Challenges for the industry - benefiting from Asia without being taken over**

A recent article on Korea in a leading business magazine commented that Korean companies were shifting their manufacturing operations to China in order to benefit from lower costs as well as thriving local demand. Korea knows China is a huge opportunity but the question facing it is how to benefit from this without being taken over. Korea's export economy has been built on the one big idea of using local cheap labour to undersell the Japanese in world markets for manufactured goods. Now China is in the process of applying

the same idea more ruthlessly and effectively, and Korea is left with an urgent need to define a new vision for itself.

There are parallels with the New Zealand forest industry. The industry has been built on the idea of using its competitive advantage of an efficient plantation system to supply a growing world with increasing quantities of high quality wood products. However New Zealand has had difficulty in processing the large volumes of lower grade wood competitively, and China, more than any other country has shown that it can turn these into high value products for the most sophisticated markets in the world.

There is a challenge here for the New Zealand industry. Should it endeavour to out-compete the Chinese supply chain, does it continue to be at its mercy, or can it be used to the industry's advantage? If so how, and what does it mean for the industry in New Zealand?

How the industry takes on this challenge will depend largely on the vision it sets itself for the 21st Century. This is yet to crystallise and should be pursued vigorously to ensure the potential benefits of the forest resource remains with New Zealand's industry. Meanwhile log exports are expected to continue play a major role.

#### **References**

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