

# MARKETS FOR FOREST PRODUCTS

Report from PF Olsen and Company Ltd

Investment in a forestry plantation is a long term commitment and thus carries a number of risks. By applying good forest management and carrying insurance cover against crop losses from fire and wind, the investor can be confident of the physical outcomes from the investment. Future increases in world population and increasing individual wealth, coupled with a decline in the wood available from natural sources, indicate a good future for plantation grown wood.

The principal risk for the investor is therefore whether the future product price will generate the required rate of return or better. The rate of return calculations used in this project are based on the assumption that the future prices obtained will be similar to recent average prices, after the peak of 1993 and current trough are discounted.

How certain are we of future trends? What are the upside and downside risks? Understanding the underlying factors will provide confi-

dence in the predictions. As with most financial forecasts there is a wealth of opinions. Not all can be correct and each year adds new information. In this report we have tried to present a balanced picture of some of the data that is currently available.

This report looks at the factors expected to impact on the longer term wood market. Specifically examined are:

- predicted demand for wood products,
- current sources and predicted levels of supply,
- international competition, and
- the effects of all on New Zealand wood prices.

Like most forecasts the demand figures are based on extrapolations of historical trends. The future supply estimates should be based on real measured quantities, since most trees to be felled over the next 20 years must be already growing. The exception is very fast growing pulpwood crops, mostly in the tropics, that can be on crop rotations as little as seven years.

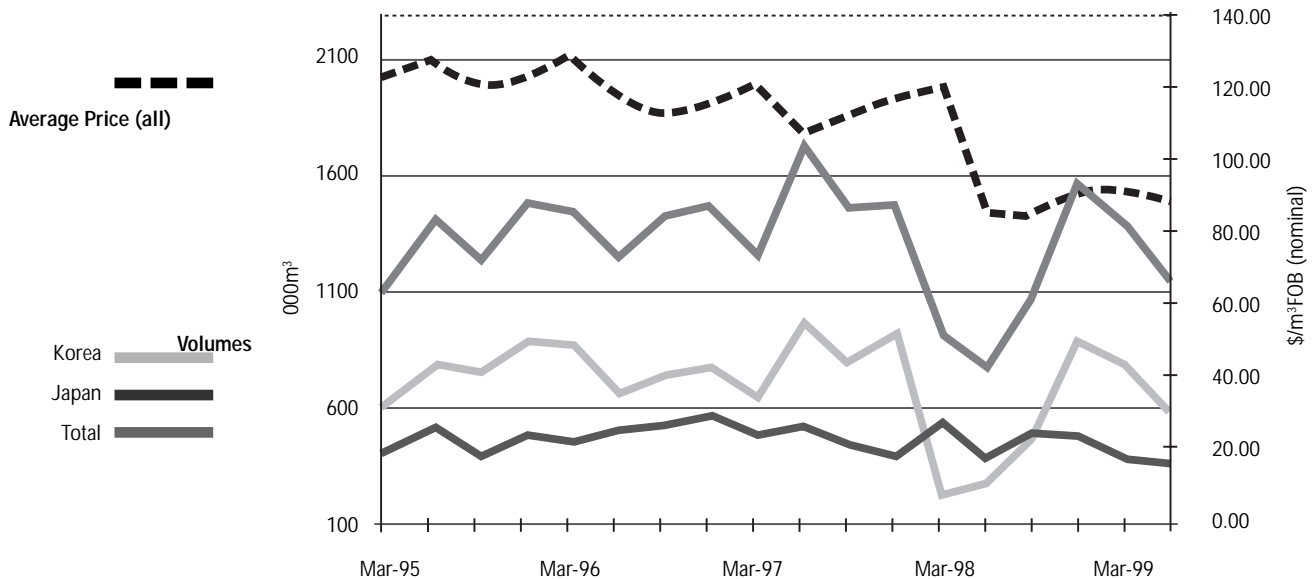
## Wood is a global commodity

Logs and wood products are now globally traded commodities. In recent years the wood trade has widened outside of traditional markets. The Nordic countries supply volumes of sawnwood to Japan, New Zealand sells to the USA and Chile to W. Europe. As for all commodity trade we can expect price fluctuations in each product category.

In 1993 unprecedented highs in the prices of logs and sawn products were counterbalanced by low pulp prices. In 1995 the reverse applied. In late 1997 the "Asian Crisis" caused a period of reduced demand in Asia for wood products. This resulted in fewer New Zealand logs exported overall and some sharply lower prices, particularly for logs exported to Korea. Falls were not spread equally

across the board. Pruned log prices have stayed firm because export demand for both pruned logs and processed knot free wood has been high and available supplies are limited. The graph below shows the most recent export patterns to New Zealand's major log buyers. (Source: MAF)

NEW ZEALAND QUARTERLY LOG EXPORTS



In the next five years wood prices will be volatile, governed largely by currency exchange effects. The economic growth of wood using countries in Asia has slowed, and will probably remain low for the medium term as local economies go through a period of retrenchment. The volumes of wood imported by our traditional customers of Australia, Japan and Korea have probably peaked and may decline somewhat. Wood users switching from natural forest timbers to plantation grown wood will have to alter their processes and specifications to handle the new species. Availability of new sources of plantation wood over the next 10 years will not always perfectly match evolving demand. Owners of standing crops of trees can defer harvest for a time when prices fall, if the crop is entirely equity funded. However large corporates will always be driven to maintain base levels of cash flow to service borrowings and infrastructure. In bad times pushing extra wood into soft markets depresses prices further.

**Future Demand for Wood Products**

Past industrial wood usage trends have closely tracked increases in population growth and per capita wealth. The World's population is now 6 billion, and is expected to be 7 billion by 2010 and 8.2 billion by 2020. Fifty-nine percent of this population is located in the Asia Pacific region. Increased wood usage per capita follows expanding per capita gross national product, up to the level of the developed countries, where increases in consumption flattens off, or decreases due to improved efficiency in wood use.

FAO recorded global industrial roundwood usage as 1.490 billion cubic metres per year in 1996. Historically the quantities of wood used have shown steady growth, though the last five years have been fairly even. FAO's latest predictions for future annual world demand for industrial wood is some 1.872 billion metres by 2010, an increase of 382 million cubic metres over 1996. This increase is less than previous predictions. The new predictions are modelled on reduced

increases in gross domestic product and incorporate the impact of expected rises in price following restrictions in supply, which will reduce demand. Forecast from other analysts cover a range in wood usage of 2.28 to 1.51 billion for year 2010.

Much of the growth in usage is expected to be in the western half of the Pacific Rim and South East Asia. 1996 production and import volumes of the main countries using wood in Asia are presented below. Source: FAO 1998 (1996 data)

PRODUCTION, TRADE AND CONSUMPTION OF WOOD PRODUCTS IN EAST ASIA

Country	Pop millions	GDP per Capita \$US	Production (000 m³)			Imports (000 m³)			Exports (000 m³)			Consumption (000 m³)		
			Round wood	Sawn wood	Panel product	Round wood	Sawn wood	Panel products	Round wood	Sawn wood	Panel products	Round wood	Sawn wood	Panel products
Japan	125.6	39,640	22,897	24,493	7,048	47,860	11,528	6,704	7	10	34	70,750	36,011	13,718
China	1243.7	620	108,718	26,969	15,349	7,169	2,684	4,612	3,480	753	483	112,407	28,900	19,478
Hongkong	6.2	22,990	0	441	41	816	636	1,277	336	427	818	480	650	500
Korea	45.7	9,700	1,994	3,440	2,136	9,066	1,161	1,644	2	24	120	11,058	4,577	3,660
India	960.2	340	24,989	17,460	348	336	17	20	23	27	20	25,302	17,040	348
Indonesia	203.5	980	47,245	7,338	10,128	178	33	47	683	429	8,302	46,740	6,942	1,873
Phillipines	70.7	1,050	3,394	313	596	636	567	278	13	145	41	4,017	735	1,760
Thailand	59.1	2,740	2,818	325	493	939	2,296	124	388	45	181	3,369	2,576	454
Singapore	3.4	26,730	0	25	355	55	758	657	26	268	325	29	515	687

It can be seen that:

- Japan, China and Korea are big importers and net users.
- Malaysia and Indonesia are the big regional exporters;
- India and China are big net users on a gross basis, but not in relation to their vast populations. Both countries have recently increased their imports. This is not reflected in the table above.

Demand of New Zealand products is largely wood for use in packaging and concrete formwork. Direct use in construction is still only limited though products such as laminated veneer lumber are making an impact. Most demand for product from New Zealand's pruned Radiata logs is currently located outside of Asia. Asian plywood manufacturers use knotty Radiata for core veneer. Tropical hardwood veneer is used for plywood faces because Radiata is regarded as too soft and they are used to the appearance of hardwoods. When tropical hardwood supply becomes constrained by supply and/or price, Asian plywood manufacturers may change over to Radiata.

The USA is driving the present buoyant market demand for knot free Radiata products. New Zealand can expect stronger competition from Chile in these markets, since Chile has substantial tariff and freight advantages. Chile's advantages are counter balanced by:

- the higher cost of finger-jointing short clears together from unpruned timber, and;
- collateral losses from waste in the process.

A pruned log can be seen to have locked in the cost of process in comparison to energy and capital costs required to convert unpruned wood to a similar product.

While there are variations in projections of wood demand, there is general agreement that the strongest drivers are population and GDP growth. There is consensus that both will increase, causing a rise in demand for wood. Such a rise in demand may result in better conversion rates, new products which require less roundwood and substitution with other materials. These developments are likely to dampen, but are unlikely to prevent the rise in demand.

**World Forest Supplies and New Zealand in Perspective**

Closed natural forests are estimated to cover some 2,700 million hectares worldwide. Forest plantations cover a further estimated 93 million hectares or just (3.6%) of the total forest area. Natural forests dominate world wood supply. The three largest producers have 83% of the standing volume and supply about 77% of the current demand:

WORLD WOOD SUPPLY IN THE PACIFIC RIM (% VOLUME)

Country	Proportion of Standing Timber	Proportion of Supply in Pacific Rim
Russia	57%	30%
Canada	14%	13%
USA	12%	34%
New Zealand	0.003%	1.3%

The three major suppliers will continue to dominate the world market for wood for some time to come. For these three major suppliers average yields per hectare have been diminishing and forests cut now are generally more remote and therefore more costly to exploit.

Environmental legislation, particularly in North America, is expected to increase costs and limit supplies. North American roundwood exports to Asia have declined from 29 million m<sup>3</sup> in 1990 to 20.9 million m<sup>3</sup> by 1996.

Demand in the USA for New Zealand wood has been increasing. New Zealand Radiata pine exports to the USA increased by 153% over the last three years to reach 345,000 m<sup>3</sup> in the year to June 1999 (MAF). The USA is now New Zealand's second largest sawn timber export destination after Australia.

Lack of infrastructure is a major impediment for Russia to increase wood supplies into Asia. Once the world's largest timber producer, output has fallen 67% between 1988 and 1994. Russia does have the capacity to increase supplies significantly, but so far increased output from its far eastern forests has been modest with only 4.5 million m<sup>3</sup> of logs going into Japan in 1998 (Japan Lumber Importers Association). Increasing production costs are likely to keep the possible expansion of production in Russia in line with increasing world market prices, but this may be balanced by the falling Rouble combined with Russia's ability to internally source most costs of machinery, material, fuel and labour. Exports into Korea from Russia in 1998 are reported to be at less than cost price.

In South-East Asia, as in most tropical regions, forest area is diminishing rapidly. World-wide forest losses are assessed by FAO at 11.3 million hectares per year, due to harvesting and/or conversion of forest to agriculture or degradation to scrub; 2.9 million hectares of this loss is in the Asia Pacific region. Supplies of logs for timber and wood based panels from South-East Asia are expected to drop by 50% over the next 25 years (source: FAO, FLC Reed). This reduction of some 46 million cubic metres is more than three times New Zealand's current harvest. The Asian region combines an increase in projected demand with diminishing supplies and is a natural market for New Zealand supplies, because of proximity and growing trade links in other industries.

Global forest plantation resources are estimated at 93 million hectares, of which New Zealand's current 1.5 million hectares constitutes only 1.6%. New Zealand forests are more significant in terms of output because of their high productivity, but compared to world wood supplies it is a very small supplier.

Only Chile, New Zealand, Australia and South Africa have predictable increased supplies of large dimension logs in the Pacific Rim region. Together they are expected to increase annual production by 30 million cubic metres of coniferous roundwood between 1998 and 2010. The Nordic countries also have surplus capacity in softwoods that can be diverted to the Pacific rim, if prices are adequate. Russia also has huge supplies if the cost of production can be met.

Indonesia, Malaysia, China, India, Canada and the USA are expected to reduce or limit supply over the next decade. The changes in the USA and Canada will be dependent on Government action. How much extra resource will they lock up, if any? Only slow growth in production is expected for North America over the next ten years to 2010 (FAO 1999). For Malaysia and Indonesia the reduction in volumes of high quality hardwood from the natural tropical forest is inevitable, since it is not being replaced by similar plantation product. Plantations in these countries are mostly producing short rotation pulp grade logs. FAO predicts a reduction in output of some 40 million m<sup>3</sup> of tropical hardwood logs from these countries between 1996 and 2010.

In 1998 both India and China have introduced or announced sharp reductions in domestic harvesting to conserve forests resources. China has announced a 37% reduction in its immediate annual cut for 10 years. This equates to a reduction of around 24 million m<sup>3</sup> per annum. China has a low per capita wood usage of 0.085m<sup>3</sup>/year. This is half the World average figure. In comparison New Zealand uses 2.1m<sup>3</sup>/year per capita.

### Matching of Supply and Demand

Supply and demand will always match, while prices will vary depending on the changes that will take place. In the short term higher prices increase supply, as was demonstrated following the timber and pulp price rises in 1993 and 1995 respectively. Substitution for dimension lumber by reconstituted or engineered wood products, steel, aluminium, cement and plastic is taking place and likely to continue when prices for solid wood increase relative to these materials. This process however can be reversed if the costs of producing these substitutes increase. Substitutes to solid wood in particular require non-renewable energy and raw material resources. Increases in the costs of energy may result from an increase in energy demand and a possible introduction of carbon taxes. This in turn would increase the demand for and price of solid wood.

On the other hand advances in process technology and higher prices will provide the impetus to further improve conversion rates, reduce waste and make recycling more attractive.

Higher prices will also encourage more people to grow wood, as has already happened in New Zealand. It should be noted that the area of plantation that would need to be established now to replace diminishing natural forest supplies would be large. There are significant constraints limiting expansion of plantations in many countries i.e. capital, management expertise and access to suitably fertile land.

In the medium and long term diminishing supplies from natural forests and an increase in demand for products now made from wood is very likely to result in higher prices. This situation provides excellent long term prospects for plantation grown timber.

#### Prospects for New Zealand Radiata Pine

In the long term a threat to markets for New Zealand wood would be very large investments in plantation forests elsewhere. A comparison between New Zealand and other producers however shows that only few other places in the world can match the growth rates achieved in New Zealand, and produce relatively large logs in a very short time of only 25 to 30 years. The trees our competitors will be selling have already been planted and there are not too many of those as discussed above. Interest in plantations has been shown in tropical areas in recent years. Most Asian and South American plantation projects are growing short rotation crops for pulp and paper production. The competitive strength of the New Zealand forest growing industry is production of large logs to substitute for logs from natural virgin forests in North America and Asia.

Expanding plantations in Brazil, Uruguay and Argentina include both hardwoods and softwoods. If their future programmes were increased and maintained at a high level they could become significant and affect the profitability of future crops planted in New Zealand. For the next 25 to 30 years such competition is unlikely to have a significant impact on markets for large dimension sawlogs.

Predicted world implicit gaps in supply and demand of between 291 and 675 million cubic metres in 2020 have to be scaled against future combined annual outputs of New Zealand and Chile of 50 - 60 million cubic metres. Many potential plantation forest areas which could approximate New Zealand growth rates in countries such as South Africa or South America are distant from ports, lack infrastructure and have strong competition for the available land for alternative uses.

Recent financial turmoil in Asia contributed to falls in prices of listed New Zealand forestry companies' shares. These falls were due to a perceived loss of future forestry export earnings. The main market event affecting New Zealand was a reduction in export volumes to Korea, our main export log destination. These have since recovered to near pre-crisis levels. Quite probably log prices will remain soft over the short term, as the major Asian economies return to a growth path.

Over the next decade, wood product prices are not expected to rise significantly. Many regions have ample production capacity. The current world economic slowdown will further mitigate prices. Large dimension sawlogs, particularly the higher grades, may be the exception. Though any price rises will be restrained by the availability of substitutes.

In the longer term however, the fundamentals of supply and demand described previously remain unaffected. Confidence in the results to be obtained from new planting or stands to be harvested in the long term should remain unaffected by these recent events.

New Zealand has gained considerable experience in growing plantation forests. The research and development that has taken place during the last 70 years has provided us with the knowledge to manage forests well, produce outstanding growth and make considerable improvements in the quality of the logs produced. There are still opportunities to further improve our skills in growing radiata pine, but the knowledge, skills and technology available gives New Zealand forest growers a considerable competitive advantage for some time to come.

New Zealand plantation grown wood is a renewable resource grown for export and domestic consumption, which allows us to manage most of our remaining natural forests for other purposes. The Resource Management Act provides a framework for the protection of water and soil values and an assurance that the commercial, environmental and socio-economic interests are suitably balanced. This in turn provides an excellent basis for eco-labelling and environmental management certification, which are likely to be required by some of our future customers.

Despite the recent problems the medium and long term outlook appears to be sound. Such outlook is based on an analysis of the fundamental factors which will shape future markets. These are:

- projected supply,
- projected demand, and
- changes in technology and production costs.

These long term fundamentals remain unchanged by the Asian crisis. Indeed, the economic retrenchment currently underway in Asia will be of future benefit by ensuring economic growth in New Zealand's wood markets will be more soundly based and sustainable.

PF Olsen and Company Ltd have given, and have not withdrawn before delivery of a copy of the Prospectus for registration, its written consent to the distribution of the Prospectus with its report included in the form and context in which it is included herein.

PF Olsen and Company Ltd has not advised on the preparation of this Prospectus and does not hereby make any presentation concerning any of the content of the Prospectus, other than its report included herein.

PF Olsen and Company Ltd may provide professional advice to the issuer of the Prospectus from time to time. However, neither PF Olsen and Company Ltd, nor any of its shareholders or directors, is presently or intends to be, a director, officer, or employee of the issuer of the Prospectus.