

Finnish Forest Sector Economic Outlook 2004–2005

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Summary

The market outlook for the Finnish forest industry is brighter than it was a year ago. This is due to the revival in GDP growth in the euro area, which is important for Finnish exports. Weighted according to the distribution of Finnish forest industry exports, real GDP growth in the world economy in 2004 is expected to be about 3%, which is more than one percentage point above the 2003 level. The revival in GDP growth has increased the demand for forest industry products, boosting Finnish paper production in 2004 to a new record level. However, export prices have been adversely affected by the oversupply prevailing in Europe's export markets and by the strong euro. Although prices are expected to rise in the last quarter of the year, the average 2004 export price of Finnish paper will be 4–5% below the 2003 figure. The 2004 export price of sawnwood will also be down slightly, due to oversupply in Europe. In the roundwood market, pulpwood removal will be up in 2004 on account of the increased production in the paper industry; some of the industry's growing roundwood needs have also been met by imports and by using stocks of harvested roundwood. Average stumpage prices will be 4% lower than in 2003, mainly because of the fall in pulpwood prices.

Euro area GDP growth will continue at about the same rate in 2005, whereas growth elsewhere in the world will already be slowing down. As Europe's demand for paper increases, this is expected to boost Finnish production and export prices in 2005. Growth in sawnwood demand in Europe will largely rely on the housing renovation market, and Finnish sawnwood export prices are expected to fall slightly, due to tougher competition. Demand for wood raw

material will increase in the paper industry, raising the level of pulpwood removal and imports. Sawnwood production and sawlog demand are expected to remain close to the high level of 2004. With no major changes anticipated in sawnwood demand and supply, sawlog prices will be at about the 2004 level. Higher production in the paper industry will increase the demand for pulpwood and thus raise pulpwood prices somewhat.

Economic Operating Environment

The economic outlook for the Finnish forest industry is more encouraging than it was a year ago. This is because GDP growth in the euro area – important for Finnish exports – is now picking up too, driven by the growth in the United States and Asia. Euro area GDP growth for 2004 will rise to about 2%, not least because exports have begun to increase in response to the clear recovery in world trade, despite the continued strength of the euro. Indeed, the indicators show that business confidence is fairly good, and is in fact higher than consumer confidence. Among the Finnish forest industry's key export markets, even Germany's GDP growth is forecast to be up in 2004, following zero growth in 2003.

In 2005, euro area GDP growth will be at about the 2004 level, whereas growth elsewhere in the world will be down slightly as a result of tighter monetary policies. The euro area growth forecast assumes an increase in private consumption. Although interest rates are also expected to rise in

the euro area, they will still be relatively low, and so economic growth should be aided by an increase in investment. The economic forecasts for 2005 are, however, subject to various uncertainties, the outcome of which could affect the situation considerably. In the United States, household indebtedness could lead to a drop in consumer demand, and the high level of net foreign debt could further weaken the US dollar. If the price of crude oil rises or stays at a higher level than anticipated, this could decelerate growth in export markets.

Forest Industry Product Markets

The consumption of printing and writing papers has begun to increase in Europe too, as a result of GDP growth and a recovery in the advertising sector. Production and exports of Finnish paper in 2004 will be up by about 8% on the previous year's figures, to yet another new production record. By contrast, prices have, in many cases, continued to fall, because of the price competition caused by overcapacity on the export markets, and due to the strong euro. Although the prices of many products are expected to rise in the last quarter of 2004, the average export prices of Finnish paper and paperboard will be about 4–5% below the level of the previous year. The price of softwood pulp has risen in 2004, whereas the price of hardwood pulp has been adversely affected by factors such as the increased supply of low-cost eucalyptus pulp. The average 2004 export price of Finnish pulp is likely to settle at a slightly higher level than the previous year, and both production and exports will increase.

In 2005, paper consumption on the main export markets in Western Europe is expected to rise further, due to the GDP growth. This will mean an increase of about 4% in Finnish paper production and exports. Although some overcapacity will still exist in paper grades of importance to Finnish exports, the consumption growth will allow scope for price increases. The average export price of paper and paperboard is likely to exceed the 2004 level

by a small amount. The demand for softwood pulp will continue to be strong because of the increased demand for paper, which will help to raise Finnish pulp production in 2005 by about 4%, almost to the level of full capacity utilisation.

Demand for sawnwood and plywood in the United States and Japan has been maintained by the high growth in GDP and construction. The demand for sawnwood and plywood in Europe – Finland's main export market – has also grown in 2004. However, the European market is still troubled by oversupply, which has led to a fall in sawnwood prices. The average export price of Finnish sawnwood in 2004 is expected to be about 2% below the previous year's level, but export volumes will be more or less unchanged. The trend in plywood export prices has also been weak on account of the tough competition, although there have been signs of a strengthening in plywood prices in Europe during the autumn. Finnish plywood exports in 2004 are expected to be up by about 4%.

Forecasts suggest that the revival in residential construction in Western Europe will be short-lived, and so the export growth prospects for sawnwood and softwood plywood in 2005 will largely depend on the housing renovation market. As sawnwood supply increases from Eastern European countries, with their lower production costs, the oversupply situation in the sawnwood market will continue. Consequently, the average export price of Finnish sawnwood in 2005 is forecast to drop slightly. Production volume in the sawmilling industry is nevertheless likely to remain close to the record production levels of 2003–2004, due to the buoyancy of residential construction on the domestic market. On the birch plywood market, the continuing tough competition and the closure of some Finnish production units will probably result in a small decrease in exports. By contrast, the average export price for all Finnish plywood will be up slightly.

Costs and Profitability in the Finnish Forest Industry

Cost trends in the Finnish forest industry in 2004 have been rather mixed. In comparison with 2003, labour, energy and transportation costs have risen, whereas the mill prices of roundwood, and especially pulpwood, have fallen. In the paper industry, the capacity utilisation rate has risen in 2004, but the drop in export prices will again reduce the industry's profitability. In the sawmilling industry, the capacity utilisation rate remains high, although the industry's profitability continues to be poor on account of the lower export prices.

In 2005, export prices in the paper industry will rise, as will the capacity utilisation rate. This will improve profitability, because production costs are expected to remain almost unchanged. In the sawmilling industry, the market will continue to be tough in 2005. Although costs are not expected to rise, profitability will again be weak on account of the low export prices.

Roundwood Markets

With paper production increasing and sawnwood production remaining at a high level, the Finnish forest industry's roundwood consumption will be up in 2004, increasing the volume of commercial fellings by 2%, to 55.9 mill. m³. Part of the industry's roundwood need is being met through increased imports and by using stocks of harvested roundwood. Stocks have had to be used since the early part of the year, because roundwood sales have been down on the previous year's level. Roundwood sales will have to pick up in autumn 2004 if the industry's purchase targets are to be met.

The stumpage price level presents a challenge for domestic roundwood sales, as stumpage prices in 2004 are expected to be about 3–4% down on the 2003 level, due especially to the fall in pulpwood prices. Roundwood imports are expected to be up by about 5% and to have a growing emphasis on wood chips rather than roundwood.

In 2005, the increasing wood raw material needs of the paper industry will lead to a rise in commercial fellings, to a total of 58.2 mill. m³, as well as an increase in imports. Some of this increase in commercial fellings will be used to replenish depleted stocks. A small rise in pulpwood stumpage prices in response to the increase in paper and pulp prices will help raise the price of roundwood a little in 2005. Sawnwood production will drop slightly but will nevertheless remain high and therefore maintain the good level of demand for softwood sawlogs, ensuring that the stumpage price remains close to the 2004 level.

Investment and Profitability in Non-Industrial Private Forestry

Total investment in timber production in Finnish non-industrial private forestry in 2004 will be almost EUR 170 mill. In 2005, investment will be somewhat higher in real terms, due to the slight increase in the level of state funds allocated for timber production. Overall, however, investment in timber production has fallen considerably since the early years of the decade. By contrast, state funds for management of the forest environment in non-industrial private forests (under the legislation on funding for sustainable forestry) have tripled in less than ten years. In 2005, state funding for these purposes will amount to nearly EUR 6 mill.

Gross stumpage earnings of non-industrial private forest owners in 2004 are expected to total almost EUR 1.5 billion, which is below the previous year's level. In 2005, the increase in fellings and stumpage prices will raise gross stumpage earnings by 3–4%.

Net stumpage earnings in 2004 will be down by EUR 4/ha on the previous year's figure, to EUR 97/ha, but will rise in 2005 to EUR 101/ha. Profitability, calculated as the investment return on forest ownership, has weakened during 2004 as a result of the fall in stumpage prices, and the return in real terms will be negative, at –1%. In 2005, the return is expected to increase to 4–5%, which represents the average for the period 1993–2003.

Assumptions and Uncertainties in Forecasting

The aim of this *Economic Outlook* is to present clear and consistent information on the current state of the Finnish forest sector and the outlook for the near future. The forecasts for the forest sector are based on publicly available statistics, world economic forecasts, market information and other forest sector data, and research conducted by the Finnish Forest Research Institute. The views of GDP growth in the world economy and in export markets have been formulated on the basis of forecasts made by a number of different organisations, among them the Organisation for Economic Cooperation and Development, the International Monetary Fund and the Research Institute of the Finnish Economy. The forecasts given in this publication are for the years 2004 and 2005 and are based mainly on information available in late September and early October 2004.

The forest sector forecasts presented here are the views of researchers about the most likely course of events. They are point forecasts and are based on export market GDP forecasts and other background assumptions about the markets. One of the greatest uncertainties in the forecasts is whether or not GDP growth will be lower than expected. The uncertainties in the US economy could affect currency markets and jeopardise the level of world

GDP growth and therefore also the growth in the euro area. Another key uncertainty is the future price of crude oil. According to the IMF forecast, a permanent USD 5/barrel increase in the price of crude oil would reduce world GDP growth by an average of 0.3 percentage points, after a lag of about 12 months. A further uncertainty in forecasting the level of world GDP growth is the future course of the Chinese economy.

If GDP growth in the main export markets in Europe turns out to be weaker than expected, the demand for forest industry products will be lower than forecast. This would further exacerbate the already intense price competition and oversupply, forcing down prices. Competition in Europe will also be intensified if the US dollar weakens further against the euro, as this would hamper European export prospects and add pressure to obtain supplies from countries outside Europe. If the growth in export markets is below the forecasts given here, this will affect export prices, production and profitability in the Finnish forest industry. With falling demand for wood, the adverse impact would spread from the forest industry to roundwood markets, forestry employment and the profitability of non-industrial private forestry. Growth in the Finnish forest sector would then fall short of the forecasts presented here.



1 World Economy

The market outlook for Finnish forest industry products is brighter than it was a year ago. Growth in the world economy picked up at the end of 2003 and has continued well in 2004, although the cyclical peak may already have been reached by the end of the year. Weighted according to the distribution of Finnish forest industry exports, real GDP growth in the world economy in 2004 is expected to be about 3%, up by more than one percentage point on the 2003 level. GDP growth in the euro area, which is important for Finnish exports, is also on a recovery path.

GDP growth in the euro area will continue at about the same rate in 2005. Elsewhere in the world, growth will remain at a good level, although the rate will already be slowing. Demand in the Finnish forest industry's export markets will therefore be maintained, although there are also risk factors that could affect growth in these markets and the market outlook. The world political situation, for example, could lead to a rise in crude oil prices or ensure that they stay high. In the United States, a continuation in household indebtedness and a possible drop in confidence could slow economic growth by more than the amount forecast, and a large foreign debt could lead to a further weakening of the dollar. In the euro area, GDP growth is under threat not only from the major budget deficits of the euro countries but also uncertainty over whether the recovery in Germany's growth will continue beyond 2004.

Slow Recovery in Euro Area GDP Growth

Growth in the world economy picked up noticeably in the second half of 2003, and the cyclical peak may already be over by the end of 2004. In the euro area, too, GDP growth has finally improved, driven by the growth in the United States and Asia. The European Central Bank (ECB) expects the euro area's growth to reach 1.6–2.2% in 2004, with the support of exports. Europe's GDP growth will nevertheless continue to be slower than that of the world economy, and there are considerable differences in growth rates among the euro countries and in the factors underlying their growth. For example, Germany's GDP growth is reliant mainly on export growth, whereas in France it is also being supported by private consumption. The euro area growth rate for the second half of 2004 is likely to be unchanged from the first six months, and could even decline, because the rise in crude oil prices is slowing the increase in consumer purchasing power.

International Monetary Fund (IMF) forecasts show that euro area GDP growth in 2005 will be at about the 2004 level, as growth in the United States and Asia will already have slowed a little. The euro area growth forecast assumes that there will be growth not only in exports but also in private consumption. With interest rates staying relatively low, a revival in investment after the decline of recent years will help build the foundation for growth.

However, realisation of these forecasts is dependent on what happens to crude oil prices, as this is critical for world GDP growth. According to the IMF forecast, a permanent USD 5/barrel increase in the price of crude oil would reduce world GDP growth by an average of 0.3 percentage points, after a lag of about 12 months.

The ECB reports that the cyclical upswing in the euro area is still slow, and so it may not raise its central rate until 2005. Inflation has accelerated but is expected to remain at about 2% in 2005, provided that the increase in crude oil prices levels off. Europe has become less dependent on oil for its energy needs in recent decades, and the percentage increase in oil prices in real terms is still below that seen during the 1970s energy crisis. The price of crude oil has fluctuated widely, and in October 2004 it rose temporarily to over USD 50/barrel (Brent). However, most forecasting institutions estimate that in 2005 the price will fall to an average of USD 35–40/barrel for the year as whole. With a slight improvement expected in euro area GDP growth and in inflation expectations, the ECB is likely to tighten its monetary policies in 2005. The IMF forecasts a rise in short-term interest rates (3-month market rates with country weightings) in 2005, to 3.1%, from the 2004 level of 2.4%.

The strengthening of the euro against the US dollar will continue, due to the uncertainties in the US economy. As the US balance of payments' current account deficit continues to grow, pressures to correct it are increasing. The rise in the dollar rate against the euro in 2004 is expected to be about 9%, to an average of USD 1.23. The average rate in 2005 is forecast to rise only slightly, to USD 1.25, due to support from rising US interest rates.

The average 2004 public sector deficit in the euro area is likely to be at about the previous year's level of 2.7%. With GDP growth continuing to be slow, budget deficits in the euro area have increased, and many countries – including Germany and France – will again exceed the limit set for the deficit (3% in 2004) by a considerable amount. So far, sanctions have not been taken against countries breaching the

Stability and Growth Pact; on the contrary, the European Commission has been discussing a slackening of the Pact's provisions, which in turn would weaken the credibility of the Pact. The continuing deficits are indirectly pushing up inflation, which could eventually lead to a decrease in economic growth.

Forecasts of euro area GDP growth are again subject to various uncertainties, including the presence of a number of imbalances in the world economy. In the United States, for instance, net foreign debt has been growing year on year and could lead to a significant weakening of the dollar and thus a crisis for the world economy as a whole. Another risk factor is the world political situation, which affects the price of crude oil. The current price trend has already led to a rise in raw-material prices and sea freight charges. If oil prices continue to rise or remain high for long, this will accelerate inflation in the euro area too, thus reducing consumer purchasing power and weakening GDP growth.

German and UK Economies

The German and UK economies, both important for Finnish forest industry exports, are continuing to grow at different rates. Although the German economy is actually growing now after its shrinkage in 2003, its weak state has held back the level of growth in the euro area, as German GDP accounts for about one third of the euro area total.

Germany's 2004 GDP growth is forecast to be 1.9%, following the zero growth of 2003. This is based on export growth, because the country's private consumption (equal to about 60% of its GDP) will actually show a decrease for the year, according to forecasts by Dresdner Bank, among others. Germany's unemployment figures have not improved since 2003 and investment demand is weak. 2005 GDP growth is forecast to slow by 0.3 percentage points, to a level significantly below the euro area average. A slowdown in the US and Japanese economies is not likely to be reflected in full in the German economy, as demand will be increasing in Germany's euro area neighbours. Counterbalancing

Forecasts of economic growth (real GDP, annual percentage change)

	Share of Finnish forest industry's export value 2003, %	Actual GDP growth % 2003	ETLA*		IMF**	
			2004	2005	2004	2005
Weighted by share of Finnish forest industry exports	100	1.8	3.0	2.9	3.4	3.1
EU15	65	0.8	2.2	2.4	2.6	2.5
Euro countries	49	0.5	1.9	2.2	2.2	2.2
Germany	17	0.0	1.9	1.6	2.0	1.8
United Kingdom	14	2.1	3.3	2.7	3.4	2.5
EU's new member countries (10)	4	3.5	4.0	4.0	4.8	4.4
Russia	3	7.3	7.5	7.0	7.3	6.6
United States	7	3.0	4.3	3.2	4.3	3.5
Asia excl. Japan	6	6.2	6.8	5.7	6.8	6.5
Japan	4	2.6	4.2	2.4	4.4	2.3
Other	11					

* Forecast by Research Institute of the Finnish Economy (ETLA) published September 3, 2004.

** Forecast by International Monetary Fund (IMF) published September 29, 2004.

the weaker position of German exports in 2005, the country's growth will be supported by an increase in private consumption and investment demand on the home market.

The United Kingdom's GDP in the first six months of 2004 was growing at the highest annual rate for four years. The forecasts predict a 2004 GDP growth about one percentage point higher than in 2003, although there were signs of a slowdown in private consumption in the summer. The buoyant growth has been supported by higher domestic demand at a time when exports have been adversely affected by the low growth in Europe and the comparatively strong pound. Consumer confidence has been maintained by generous pay increases and a low (4.8%) unemployment rate. Low interest rates have served to increase private-sector investment but have also led to an increase in household indebtedness. Most of this indebtedness is tied up in homes and other real estate; house prices in the second quarter of 2004, for example, were up by 20% on the same quarter the previous year, due to strong demand. Fearing that the property bubble will

burst, the Bank of England has gradually raised its central rate from 3.5% in autumn 2003 to 4.75% at the end of August 2004. Rates are expected to continue rising, which will be a contributory factor in the forecast slowing of the economy. The pound's average rate against the euro in 2005 is expected to be unchanged from 2004 (GBP/EUR 0.68).

Growth in US Economy Already Peaked

The 4.5% growth rate in the US economy in the first quarter of 2004 was surprisingly high. It then slowed to 3% in the second quarter. The high growth rate was based once again on private consumption and the substantial monetary and fiscal policy recovery measures. During the summer, however, consumer confidence in the future of the economy was weakened, partly because developments in the labour market fell short of expectations, but also because the price of crude oil increased. The index of industrial production also fell during the summer. Despite partially conflicting expectations, US GDP

is nevertheless projected to be up by over 4% for 2004 as a whole.

The central role of households in maintaining growth in the US economy will weaken in the second half of 2004. Households are having to make compromises over purchase decisions and a greater proportion of their income is going on servicing major debts. The tighter monetary policy has already increased the loan servicing costs of households. Growth in overall demand is increasingly relying on private investment and exports in the second half of 2004, and this will continue in 2005. In addition, residential construction will still be relatively buoyant in 2005. GDP growth in the United States in 2005 is expected to be over 3%, or about one percentage point below the 2004 level. By comparison, world GDP growth is forecast to drop by only about half a percentage point.

There are many uncertainties surrounding the US growth forecast. The crude oil price, in particular, is a cause of concern for the economy and is also depressing prices on the equities market. US interest rates were at a historic low of 1% for about a year until early summer 2004, when the Federal Reserve raised its central rate by 0.25 percentage points, which it has since repeated twice. If the economic growth indicators continue to suggest a brighter outlook and the inflation rate looks like rising, the Federal Reserve might feel the need for similar further increases in interest rates, even before the end of 2004. Interest rates in 2005 are expected to rise further.

Imbalances in the US national economy are likely to weaken the country's economic growth prospects, at least in the longer run. One such problem is the balance of payments' current account deficit, which has already risen to over 5% of GDP. In trade with

China, in particular, considerably more goods are being imported than exported. A further problem is that the national debt in the United States will be over USD 400 billion at the end of 2004. As the deficit grows, it could well become a problem, even in the short term, and exchange rate movements could contribute to stopping the flow of foreign capital that finances the debt.

Will China Also Slow Japan's Growth?

Fluctuations in the world economy are increasingly linked to developments in the Asian economies. The huge annual investment growth and strong demand growth in China, in particular, are already being felt in the world economy. China now accounts for almost 10% of all direct investment in the world, which is a higher proportion than that invested in the United States. Attracted by growing consumption and cheap labour, increasing numbers of foreign companies are investing in industrial plants in China and the newly industrialised countries in East Asia. China's GDP growth will reach 9% in 2004, while in 2005 the country's leadership intends to keep GDP growth to a level of 8% in order to control growth in the overheated economy. In Asia as a whole, GDP growth in 2005 will drop to about 6%.

Japan's improved GDP growth in 2004 is largely attributable to the growth in exports to the booming Chinese economy. However, the slowdown in growth in the United States will weaken the economic outlook for Japan. Japan's 2004 GDP growth will nevertheless be more than 4%, while in 2005 it will be just below 3%, due to lower export demand. Private consumption in Japan is still not in a position to support GDP growth.



2 The Finnish Forest Industry

2.1 Production and Exports in the Sawmilling and Plywood Industries

Demand for sawnwood and plywood in Western Europe, the United States and Japan has increased in 2004 as a result of economic growth and especially the revival of construction. However, the European sawnwood market has continued to suffer from over-supply and related price reductions. In addition, the competitiveness of Finnish producers has remained weak in relation to key competitors Sweden and Russia, due to the strong euro. Despite this, the first half of 2004 saw an increase in exports of pine sawnwood to the United Kingdom and a recovery in spruce sawnwood exports to the German market. Forecasts indicate that Finnish sawnwood exports in 2004 will be up by about 1% on the 2003 level, whereas export prices will be down by about 2%. Production and exports of plywood in 2004 will be up by about 4%, despite the weak price trend, although there were signs of a rise in plywood prices in early autumn, prompted mainly by the robust demand and high prices in North America.

According to Euroconstruct's June 2004 forecast, the revival in residential construction in Western Europe will be only a temporary phenomenon. The growth prospects for sawnwood and softwood plywood exports in 2005 will depend on growth in the housing renovation market. At the same time, the supply of sawnwood from Eastern Europe will continue to grow. With Europe's sawnwood markets

still troubled by overcapacity, Finnish export prices will probably fall a shade further. Production in the Finnish sawmilling industry in 2005 is forecast to be down slightly from the high level of 2004, because of the competition for market share in exports and the good level of residential construction on the home market. Finland's plywood exports are likely to contract slightly in 2005, due to continuing tough competition on the birch plywood market and the closure of two small Finnish mills. The average export price of plywood will rise a little.

The estimated consumption of sawn softwood in Western Europe in 2003 grew by about 5%, or approximately 3.7 mill. m³, and Finland had the largest estimated per-capita consumption. Sawn softwood consumption has also grown considerably in recent years in Estonia, Sweden and Denmark, which is partly explained by the greater supply of higher added-value products. Production of sawn softwood in the EU was up in 2003, but by less than the increase in consumption. Correspondingly, there was an increase in the EU's net imports of sawn softwood, particularly from Eastern Europe.

Euroconstruct's June forecast of total residential construction in Western Europe in 2004 indicates a growth of almost 4%, and a growth of 2% in housing renovations. In 2003, construction increased more than had been forecast, especially in Finland, Denmark, Ireland and, among the new EU members, the Czech Republic. The link between construction and

The Finnish sawmilling and plywood industries, 2003 (1 000 m³)

	Sawnwood	% of production	Plywood	% of production
Production	13 745	100	1 300	100
*Domestic use	5 576	41	130	10
Exports:	8 169	59	1 170	90
EU	5 174	38	965	74
Africa	1 156	8	2	0
Japan	1 024	7	11	1
Asia excl. Japan	641	5	42	3
North America	33	0	56	4
Russia	4	0	3	0
Other	137	1	93	7

The plywood figures comprise birch plywood, softwood plywood and laminated veneer lumber (LVL).

* Estimated domestic use = production – exports

Sources: Statistics 2003 (Finnish Forest Industries Federation) and Finnish Forest Research Institute

sawnwood consumption is not straightforward, however, because sawnwood accounts for only a small proportion of the total costs of construction. In the United States, for example, the value of residential construction and housing renovations increased by 10% in 2003, whereas consumption of sawn softwood as a building material increased by only 1%.

Consumption of sawnwood in Japan was up in 2003 for the first time in nearly ten years. At the same time, the proportion of timber-framed houses among the total volume of new residential construction increased a fraction, reaching 45%. The number of building permits issued for timber-framed houses in Japan in January–July 2004 rose by 1% on the previous year's figure.

Sawnwood Production Remains High in 2004

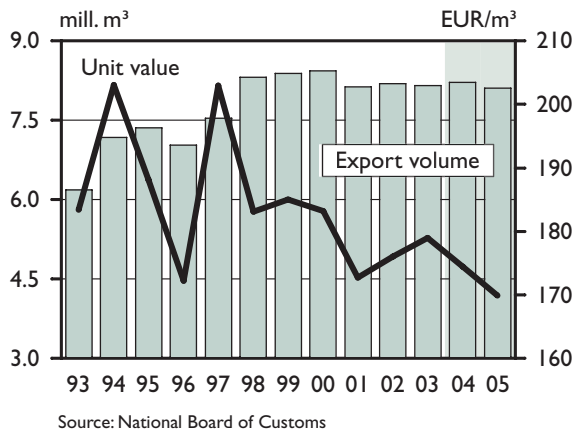
Demand from the domestic construction industry led to a growth of 3% in Finnish sawn softwood production in 2003, to a new production record of 13.65 mill. m³. An estimated 5.5 mill. m³, or about 40%, of this was consumed directly on the home market or used as a raw material for added-value

processing in Finland.

Sawnwood exports in 2003 remained at the previous year's level. Exports to Asia and North Africa increased, as construction growth in most of Finland's European export markets was again slow. Together, Asia and North Africa accounted for about one third of Finnish sawnwood exports in 2003, and exports to these regions have continued to grow in the first half of 2004, despite the euro sometimes being considerably stronger than the dollar.

The export value of prefabricated wooden houses, wooden furniture and other added-value processed wood products rose in 2003 to over EUR 600 mill., or almost one quarter of the total export value of the wood products industry, which is a clear indication of the increase in the degree of processing. The corresponding proportion in 1993, for example, was 11%.

The average euro rate against the Swedish krona has remained unchanged during 2004 in relation to its 2003 rate. The strong construction growth in Sweden has eased competition on the export market somewhat. Sweden's exports declined a little in 2003, but exports of Swedish sawnwood in the first half of 2004 were slightly improved, and production



Volume and unit value of sawnwood exports, 1993–2005 at 2003 prices (wholesale price index)

was also up.

Competition in Western Europe, the main export market for Finnish sawnwood, is intensifying as a result of the growing imports of sawnwood from Eastern Europe. This, in turn, is due to the new export-oriented sawmilling industry investments in the Baltic countries and Northwest Russia. The main export markets for sawnwood from the Baltic countries are the United Kingdom and Germany, whereas those for Russian sawnwood include not only the UK and Germany but also Egypt, Japan and China. Exports of Russian sawnwood grew by about one fifth in 2003, and growth in 2004 has been continuing at an annual rate of about 10%.

Despite the oversupply situation and weak price trends prevailing in Europe, production of Finnish sawnwood increased in January–August 2004 by almost 1% on the same period in 2003. The reason for this was the need to preserve market share in the face of tough competition. Efforts have also been made to improve the poor profitability of sawmills by keeping capacity utilisation rates high. Sawnwood exports in January–June 2004 were up by 3%, largely as a result of pine sawnwood exports growing by 7%, while exports of other grades fell or remained unchanged. However, there were differences between the various export markets. In terms of quantity, the biggest increases in sawn-

wood exports in January–June were to Japan, Germany, Belgium and Egypt. Japan is now Finland’s second-most important export destination for spruce sawnwood.

The market for pine sawnwood has deteriorated in the second half of 2004, while the proportion of spruce sawnwood in total exports has been rising in response to the better demand-supply balance in European markets. Despite the strong euro, European exports of sawnwood to the United States increased by almost 50% in the first half of 2004, which reduced the supply of spruce sawnwood left on the European market. Exports of Finnish sawn softwood in the second half of 2004 are forecast to remain at about the previous year’s level, bringing the export total to over 8.2 mill. m³.

Domestic consumption of sawnwood in the first half of 2004 was again high, continuing the trend of 2003. The Research Institute of the Finnish Economy forecasts that residential construction will be up by about 10% in 2004, much of this consisting of detached houses rather than apartment blocks, which is good news for the consumption of wood products. Estimated domestic consumption of sawnwood in 2004 will thus continue to be high, boosted by the slight increase expected in added-value processing of sawnwood in the wood products industry. Although the August 2004 business survey by the Confederation of Finnish Industry and Employers (TT) indicated that the wood products industry’s stocks of finished products are above normal, sawnwood production is expected to remain at approximately the 2003 level because of the slightly improved economic outlook for the second half of the year.

Further Decline in Europe’s Sawnwood Prices in 2004

Oversupply on the European market caused a drop of 4–5% in pine and spruce sawnwood export prices in the first half of 2004, weakening the profitability of the sawmilling industry. The sawnwood price trend on other markets has been more favourable, however. In the United States, overheating in the building sup-

plies market has led to higher prices for wood-based panels and sawnwood, and has increased imports. A contributory factor has been the record level of construction activated by the low US interest rates: new housing starts were up by 8% in the first half of 2004 compared with the same period the previous year. In Japan, too, the price trend for spruce sawnwood has improved during the summer.

Sawnwood producers have sought to justify the need to raise prices in Europe on the grounds of the price trends in other parts of the world, but with no significant improvement in the demand-supply situation, price increases are unlikely in Europe. Sawnwood prices in the second half of 2004 are nevertheless expected to stop falling, which should mean that the average export price of Finnish sawnwood for the year will be down by about 2% on 2003.

No Growth Anticipated in Sawnwood Exports in 2005

Europe's 2005 GDP growth is forecast to be unchanged from 2004, but interest rates are expected to rise. Euroconstruct's June 2004 forecast indicates that the recovery in residential construction in Western Europe will be short-lived, as the value of residential construction in 2005 is forecast to decrease by 0.5% on the 2004 level. Close to half of the value will be housing renovations, an area which is forecast to continue growing in 2005 – by almost 2%. Construction growth forecasts indicate that the best prospects for sawnwood demand are in Eastern Europe and the Nordic countries. Residential construction in Germany and the UK is likely to grow by only about 1%.

With only moderate growth expected in sawnwood consumption in 2005, the supply of sawnwood to Western European markets from Eastern European countries – with their lower production costs – will have a critical impact on Finnish sawnwood exports in 2005. Sawnwood capacity in Northwest Russia and the Baltic countries has increased by an estimated 1.4 mill. m³ in 2004, and a similar increase

is also anticipated in 2005. Sawmilling investments in Eastern Europe by Finnish companies in 2005 will also have some effect on Finnish exports; although they will have a positive impact on corporate profitability and market shares, they will reduce the quantity of exports recorded from Finland because they will replace such exports. However, construction in Russia is growing at an annual rate of about 10%, and Russian Federation estimates indicate that domestic consumption of Russian sawnwood and wood-based panels in 2005 will increase more rapidly than exports. Should this be the case, it will ease the competitive situation for Nordic producers.

The demand-supply balance in Europe will also be affected by changes in the US market. In 2003, sawnwood exports from Europe to the United States totalled 2.7 mill. m³. With the enormous US construction boom expected to level off in 2005, forecasters (e.g. the Bank of Montreal) predict a significant drop in sawnwood prices on the US market in 2005. Canada's import duty on US products is also being cut by half from its present level of 18%. Therefore, although European exports to the United States have been increasing in recent years, further growth opportunities are no longer likely. Though difficult to forecast, the trend in the EUR/USD exchange rate will nevertheless be critical in determining the direction of the sawnwood trade between the two continents; another key factor will be the level of shipping costs as a result of increased international trade and higher oil prices.

The demand-supply balance in the European sawnwood market could be aided by China's strong demand growth and its increasing output of higher added-value wood products, which will draw off some of the sawnwood oversupply in Europe. However, with continuing oversupply on key export markets in Europe, the average export price of Finnish sawnwood in 2005 is forecast to be down by about 1% on the 2004 level, and export volumes to be down by 1% (to 8.1 mill. m³).

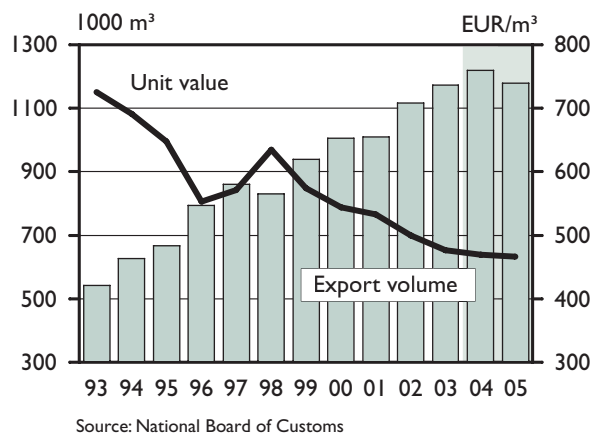
Finnish Consumption of Sawnwood Will Remain High in 2005

The increase in GDP growth forecast for Finland in 2005 will stimulate mobility in the labour force, which, supported by low interest rates, will fuel construction of detached and other low-rise housing. According to the spring 2004 forecast of the Confederation of Finnish Construction Industries (RT), Finnish residential construction investment in 2005 will remain at the very high level seen in 2004. The Research Institute of the Finnish Economy also believes that the outlook for Finnish housing production is good, forecasting an increase of 3% in 2005. Finnish demand for sawnwood is therefore expected to remain strong.

Finnish sawnwood production in 2005 is forecast to be approximately 13.6 mill. m³, which will be just short of the high level of 2004. This slightly lower production figure, and the slight drop in exports too, will be due to the fewer number of working days in 2005 and the closure of some sawmills. The strong growth in supply from Eastern European countries, which operate with lower raw material and other costs, has weakened the trend in sawnwood prices and caused profitability problems for the Finnish sawmilling industry. One factor that could upset the production forecast for Finnish sawnwood is the possible reduction in supplies of wood raw material after the end of the forest taxation transition period, which could turn out to be more than a temporary reduction.

Continued Growth in Production and Exports of Softwood Plywood

Plywood consumption in Western Europe in 2003 grew by 6%, or 350 000 m³, which was greater than the growth in production. In volume terms, the highest consumption growth was in Denmark. By contrast, there was a decrease in consumption in the United Kingdom, which is Europe's biggest user of plywood. Exports of Russian plywood were up by 10% and Finnish plywood by 5%.



Volume and unit value of plywood exports, 1993–2005 at 2003 prices (wholesale price index)

Finnish plywood production is already approaching 40% of all plywood production in Western Europe. However, the plywood industry constitutes only a small proportion of the European wood-based panels industry, which also includes chipboard, OSB board and MDF board.

Plywood demand in the United States has been at a record high on account of the boom in low-rise construction. Following a drop in the country's plywood production capacity due particularly to the forest protection measures for the Pacific Northwest, the US domestic market has been consuming South American and Asian plywood, some of which would otherwise have gone to the European market. In addition, European producers have increased their exports to North America, where prices have been very much on the rise.

With an increase in the capacity utilisation rate in softwood plywood production, Finnish plywood output was up by 5% in 2003, to a new record of 1.3 mill. m³. Softwood plywood already accounts for over 60% of Finnish plywood production.

Finnish plywood production in the first half of 2004 was up by 2% and exports by 5%. Exports of softwood plywood were up by 4%, although market share was lost in some markets. Competition on the German market in the first quarter of 2004 was especially tough, as the country's imports of plywood fell

Forecasts of production and exports in the sawmilling and plywood industries (1000 m³); percentage changes from previous year are shown below the respective volumes

	Production			Exports		
	2003	2004	2005	2003	2004	2005
Sawn softwood	13 645	13 700	13 600	8 153	8 210	8 110
	3	0	-1	0	1	-1
Plywood	1 300	1 350	1 310	1 172	1 220	1 180
	5	4	-3	5	4	-3

Forecasts of export prices for sawnwood and plywood (as percentage changes from previous year*)

	2003	2004	2005
Sawnwood	2	-2	-1
Plywood	-5	-1	1

* Export prices are nominal unit values

by 14%. Finland lost market share particularly to Germany's neighbours, Austria, the Czech Republic and Poland. Demand for softwood plywood began to improve in the second quarter, as construction picked up in Europe. This led to longer delivery times and pressure to raise prices. To avoid the previous oversupply, producers had been increasing their deliveries to markets outside Europe, and so the unexpected rise in demand in Europe was difficult to satisfy. This led Finnish producers in summer 2004 to announce modest price increases for September and October.

Exports of Finnish birch plywood rose in the first six months of 2004 by as much as 6%, despite the tougher competition on export markets from Russia and the Baltic countries. The price trend for birch plywood was fairly weak in the first half of the year, but the market has since improved and price increases of 3–5% were announced in September.

Delivery times for softwood plywood have lengthened because of the high level of orders in hand, and Finnish production capacity for softwood plywood could well be in full use in the second half of 2004. Finnish plywood exports in the last

six months of the year are expected to be as high as in 2003, and total exports are forecast to exceed the record of 1.2 mill. m³. Plywood production is forecast to be up by 4% in 2004, whereas the average export price will be slightly below the previous year's level, due to the weak price trend in the first six months of the year.

Competition in Export Markets to Remain Tough in 2005

Russian exports of birch plywood are likely to increase further in 2005, even though the country's domestic consumption is rising; Russia's plywood consumption was up by one fifth in 2003. On the European market, competition will therefore continue to be tough. Finnish plywood production in 2005 is likely to remain at the high level of 2004, or may fall slightly because of a decrease in birch plywood production (UPM-Kymmene has announced that it is considering the closure of two of its smaller birch plywood mills).

If the trend in the softwood plywood market is to be favourable, it is essential that plywood consumption in the United States remains strong in 2005, ensuring that there is enough demand to meet the increasing supply from South American production and elsewhere. Although the export volume of Finnish plywood is forecast to be marginally down in 2005, a continuation of the rising price trend that began in the second half of 2004 should mean that the average export price of plywood in 2005 will be higher than its 2004 level.

2.2 Production and Exports in the Pulp and Paper Industry

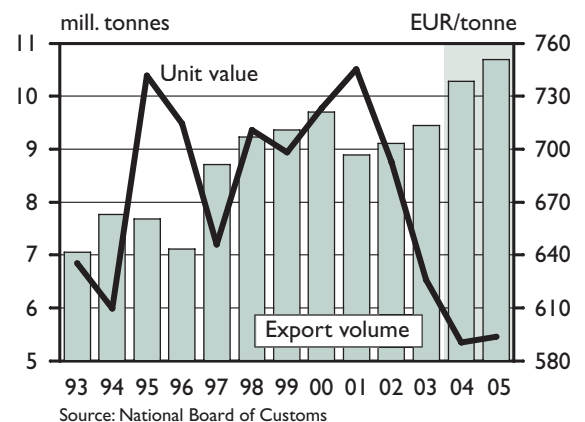
The consumption of printing and writing papers in Europe has increased significantly in 2004 as a result of GDP growth and a recovery in the advertising sector. This has contributed to an increase in production and exports of Finnish paper, which are forecast to be up by about 8% in 2004 compared with the previous year's figures. Paperboard production will also be up. Prices, however, have continued to fall in many areas, due to the price competition caused by overcapacity and because of the strong euro. Although producers have attempted to raise prices of a number of paper grades in the latter part of the year, the average 2004 export price of Finnish paper and paperboard will be 4–5% below its 2003 level. The softwood pulp price in 2004 will be significantly above the previous year's level, whereas the price of hardwood pulp has been affected by the increased supply of low-cost eucalyptus pulp on the world market. The average 2004 export price of pulp is likely to settle at a level slightly above that of 2003, and both production and exports will be up significantly.

GDP growth in the Finnish paper industry's main export markets in 2005 is expected to be at about the same level as in 2004, which will mean a further increase in the demand for paper. Production and exports of Finnish paper are consequently forecast to increase by about 4% in 2005. Although there will still be some overcapacity in Europe in paper grades of key importance to Finnish exports, the growth in consumption will permit an increase in paper prices. The average export prices of paper and paperboard will probably be slightly above the 2004 level. The demand for softwood pulp is likely to remain strong, raising Finnish pulp production by about 4% on the 2004 figure. This will bring the industry close to full utilisation of its production capacity. Pulp exports will increase by about 4% in 2005, and the average export price by about 2%.

An End to Falling Paper Prices

Printing and writing paper prices have been falling in Europe for several years, but this appears finally to have come to an end in 2004. There are, in fact, already signs of a rise in prices. For example, producers have announced substantial price rises in printing papers on the spot and quarterly markets in Europe. This marks the beginning of an upturn for the paper market in Europe.

The gradual rekindling of GDP growth in Germany and in other key euro area economies has been accompanied by a growth in advertising in different media, including magazines and newspapers. The space given to job vacancy advertisements has also increased in 2004, as new jobs have been created. Retail advertising in Germany is estimated to have increased in the first quarter of 2004 by almost 10% on the same period the previous year. The extent to which printing paper producers benefit from the accelerating growth in Europe's advertising sector will also depend on the impact of the sector's structural changes on advertising volumes in the different media. The main question, especially in the longer run, is whether new advertising tools will replace printed advertising or whether printed advertising will be increasingly used to supplement the new media.



Volume and unit value of paper exports, 1993–2005 at 2003 prices (wholesale price index)

The Finnish pulp and paper industry, 2003 (1000 tonnes)

	Chemical pulp	%	Paper	%	Paperboard	%
	of production		of production		of production	
Production	7 350	100	10 353	100	2 706	100
Domestic use*	5 115	70	909	9	445	16
Exports:	2 235	30	9 444	91	2 262	84
EU	1 843	25	6 514	63	1 380	51
Asia	160	2	819	8	352	13
Africa	17	0	99	1	72	3
United States	129	2	951	9	136	5
Russia	26	0	203	2	86	3
Other	60	1	859	8	236	9

* Estimated domestic use = production – exports

Sources: Statistics 2003 (Finnish Forest Industries Federation) and Finnish Forest Research Institute

The demand for printing papers has also been on the increase in North America in 2004, with the exception of newsprint. According to the Pulp and Paper Products Council (PPPC), which represents North American producers, demand in January–September 2004 was up by 4% on the previous year's figures. This has also been reflected in pulp prices, which have been running at historically very high levels in North America during 2004. The average capacity utilisation rate of North American printing paper mills in January–September 2004 (92%) was clearly up on the level of a year earlier, due to the growth in domestic demand and exports. The continent's producers have also been able to increase the prices of magazine and fine papers used in advertising. GDP growth in North America is forecast to remain strong, which will probably guarantee favourable demand and prices trends for the continent's producers in the second half of 2004 and in 2005.

The August 2004 business survey by the Confederation of Finnish Industry and Employers (TT) revealed that the economic expectations of Finnish paper industry representatives were not only positive but the best for over four years. According to the survey, almost half of the companies expected an

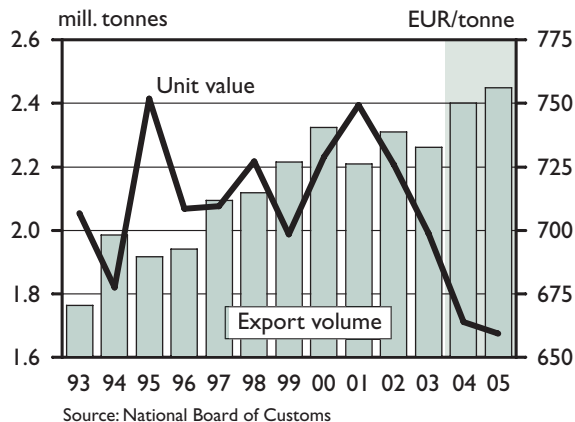
improvement in the economic outlook, and not one of the respondents foresaw a worsening situation.

Increased Production and Exports of Paper and Paperboard in 2004

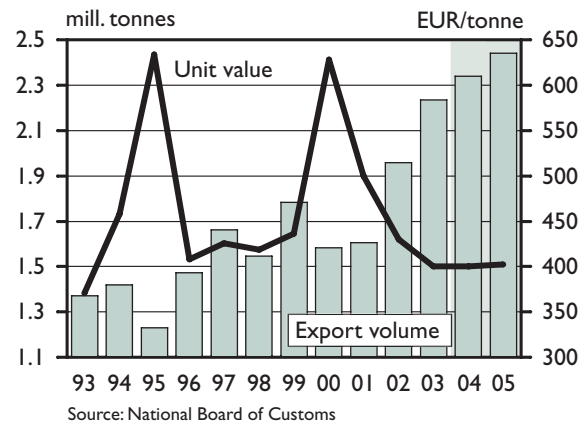
Production and exports in the Finnish paper industry in 2004 will be up significantly on the previous year's figures. The paper and paperboard capacity utilisation rate was about 92% in January–September 2004, which was three percentage points above the rate for the same period in 2003. Paper production and export volumes in January–September were more than 8% above the previous year's figures.

The growth in paper production is also expected to continue in the remaining months of 2004, bringing the forecast growth in production and export volumes for the full year to about 8%. In January–September, paperboard production was 95 000 tonnes higher than the previous year, and production is expected to be up in the last quarter of the year too.

In January–September 2004, paper export prices were an average of 6% below their level for the same period in 2003. This was attributable to the overcapacity and was exacerbated by the strength-



Volume and unit value of paperboard exports, 1993–2005 at 2003 prices (wholesale price index)



Volume and unit value of pulp exports, 1993–2005 at 2003 prices (wholesale price index)

ening of the euro against the dollar. Uncoated fine paper was the worst affected, with a drop of 9% in its export price compared with the previous year. Coated magazine paper prices were 4% below the previous year's level.

A considerable proportion of Finland's printing and writing paper exports are based on long-term (approx. 12 months) delivery contracts. Even if price increases are introduced for shorter contracts, it takes a while before these can be reflected in longer term contract prices and thus in average paper prices. Furthermore, the extent to which any price rises in magazine papers, such as LWC and SC grades, are transferred to prices agreed in long-term contracts is still unclear. It may be that, at this stage, paper producers are mainly trying to boost their financial and market position through short-term contracts, without adding significant pressures to long-term contract prices.

The average export price of Finnish paper and paperboard in 2004 will be 4–5% below the figure for 2003.

Two Trends in 2004 Pulp Prices

The world market price of hardwood pulp has fallen due to the plentiful supply. The supply situation is attributable to the considerable increase of recent years in the production capacity for plantation eucalyptus pulp, which is produced at a low cost. The weak price trend in uncoated fine paper – an important end use – has also affected the price of hardwood pulp. The average export price of Finnish hardwood pulp fell by 10% in the first half of 2004 compared with the same period the previous year.

The price of softwood pulp, on the other hand, has improved as a result of the more favourable relation between demand and production capacity. The price of Finnish softwood pulp exports in the first six months of 2004 was 5% higher than the previous year. Softwood pulp is used especially in papers where an excellent print quality and strength are needed, such as magazine papers. Production of these papers was up substantially in the first half of 2004.

According to the Pulp and Paper Products Council (PPPC), the capacity utilisation rate of the world's market pulp producers in January–August 2004 was an average of 96%. At the same time, production was up by about 5% on the previous year. The capacity

Forecasts of production and exports in the pulp and paper industry (1000 tonnes); percentage changes from previous year are shown below the respective volumes

	2003	Production 2004	2005	2003	Exports 2004	2005
Chemical pulp	7 350	7 850	8 200	2 235	2 340	2 440
	3	7	4	14	5	4
Paper	10 353	11 200	11 600	9 444	10 280	10 690
	3	8	4	4	9	4
Paperboard	2 706	2 850	2 900	2 261	2 400	2 450
	-1	5	2	-2	6	2

utilisation rate in August was above average because producers were intentionally increasing pulp stocks, which grew to a level equivalent to an estimated 41 days' supply. Knowledge of the increase in stocks depressed prices in the early autumn. The PPPC statistics cover about 85% of the world's market pulp production capacity.

Finnish softwood sulphate pulp capacity was augmented in spring 2004, when UPM-Kymmene carried through its decision to modernise the Pietarsaari pulp mill, raising its annual capacity by 180 000 tonnes. The start up of the German Stendal market pulp mill in the autumn has also increased supply on the European softwood pulp market.

The 2004 export price of Finnish sulphate pulp is expected to be almost 2% above that for 2003. Production of this pulp in 2004 is likely to be up by about 7%, and exports by about 5%, on the 2003 level.

Production and Exports of Paper Will Increase in 2005

With further increases in advertising and consumption in Europe in 2005, the demand for Finnish paper and paperboard will rise. The biggest increase is likely in Finnish exports of coated fine papers, whereas newsprint exports will probably remain at the 2004 level. Exports of magazine papers will also increase, although the growth in demand for coated

Forecasts of export prices for the pulp and paper industry (as percentage changes from previous year*)

	2003	2004	2005
Chemical pulp	-7	1	2
Paper	-9	-5	2
Paperboard	-4	-4	1

* Export prices are nominal unit values.

magazine papers will have to be considerable to completely eliminate Europe's overcapacity problem. The Association of European Publication Paper Producers (Cepiprint) estimated in May 2004 that about 9% (or about 0.9 mill. tonnes) of the production capacity for these grades will still be standing idle in Western Europe in 2005.

Economic growth in the new EU member states is high, which will undoubtedly lead to an increase in paper consumption in these countries. This will bring new market opportunities for Finnish papers, too. The impact of the EU enlargement on the paper industry market in 2005 will nevertheless be quite mild.

Pulp and paper demand is currently growing fastest in Asia, and especially in China, which in 2003 consumed roughly one in every seven tonnes of paper produced in the world. It is estimated that China's paper consumption will grow at an annual rate of well over 5% in the current decade. This

growing demand will be met not only by China's own expanding paper and paperboard production but also by imports. Although there are substantial forest planting programmes under way in China that will allow an increase in pulp production using domestic wood fibre in the second half of the decade, there will still be plenty of demand for imported pulp and recycled fibre. Net exports of paper and paperboard from the member countries of the Confederation of European Paper Industries (CEPI) to Asia in 2003 were up by 16%, those of waste paper by 5% and papermaking pulp by 13%.

The price level of European paper sales contracts agreed in autumn 2004 and spring 2005 will largely depend on whether or not the growth in the economy and in consumer demand continue at the level seen in the first part of 2004. The anticipated strengthening of demand will also have an impact on export prices, probably resulting in a higher average export price for paper in 2005. Any rising trend in prices will be kept in check not only by the paper producers' overcapacity but also the expected slight strengthening of the euro. A rapid rise in prices typical of previous upswings is therefore not anticipated. Paper and paperboard export prices are nevertheless forecast to rise in 2005 to a level of about 2% higher than the 2004 average.

The rise in prices will also lead to improved profitability for Finnish paper producers, which will be supported by a further rise in capacity utilisation rates. Production and exports of paper in 2005 are forecast to be up by about 4%, and paperboard by about 2%, on the 2004 level.

Pulp Capacity Will be Almost Fully Used in 2005

Completion of the Veracel (an associated company of Stora Enso) eucalyptus pulp mill in Brazil will contribute to a further increase in the world's papermaking pulp production capacity in 2005. The Veracel mill's annual production capacity will be almost 1 mill. tonnes. However, the demand for pulp

is also on the increase to feed the growing demand for paper.

The export price of Finnish sulphate pulp in 2005 is forecast to be slightly above the 2004 level. The weakness of the US dollar against the euro will limit increases in the euro price of pulp on the European market. The volume of pulp production in Finland will be up by about 4%, bringing full capacity utilisation at some mills. The growth in pulp exports in 2005 is forecast to slow to about 4%, in part as a result of the capacity limit.

2.3 Costs and Profitability in the Finnish Forest Industry

Cost trends in the Finnish forest industry in 2004 have been rather mixed. In comparison with 2003, labour, energy and transportation costs have risen, whereas the prices of roundwood, and especially pulpwood, have fallen. In the paper industry, the capacity utilisation rate has risen in 2004, but the drop in export prices is again affecting the industry's profitability. In the sawmilling industry, the capacity utilisation rate remains high, although the industry's profitability continues to be poor on account of the lower export prices, despite the modest rise in sales.

In 2005, both paper prices and capacity utilisation rates are expected to rise, which should see the paper industry's profitability starting to improve. In the sawmilling industry, competition in the export markets will continue to be tough in 2005. There will be no increase in sawnwood prices, and production volumes are forecast to remain at the 2004 level. Profitability in the sawmilling industry will be about the same as in 2004, because no major changes are anticipated in production costs.

Paper Industry Profitability Weakened by Decline in Prices

In 2003, the Finnish forest industry's export income fell due to lower export prices, which affected profitability in both the paper and wood products industries. The 2003 combined turnover of the three largest Finnish forest industry corporations (Stora Enso, UPM-Kymmene and Metsäliitto Group) was EUR 30.5 billion, which was 5% down on the previous year. Their combined profit before extraordinary items in 2003 amounted to approximately EUR 0.8 billion, which was only half the previous year's figure; their return on capital invested was 4%, and the year-end debt ratio was at the previous year's level of 65%.

Total investment by all Finnish forest industry corporations in 2003 was about EUR 2.3 billion, representing 7% of turnover. Some 65% of this investment was made abroad. Investment in Finland was at about the same level as the previous year, while investment abroad was up by EUR 300 mill.

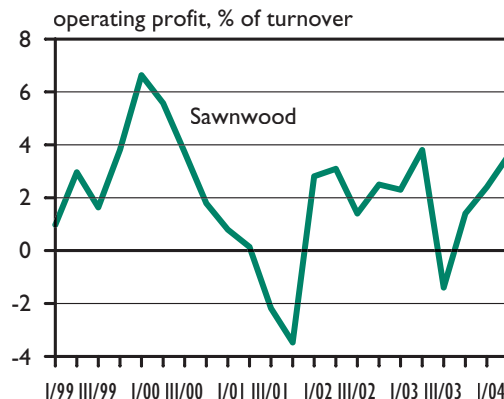
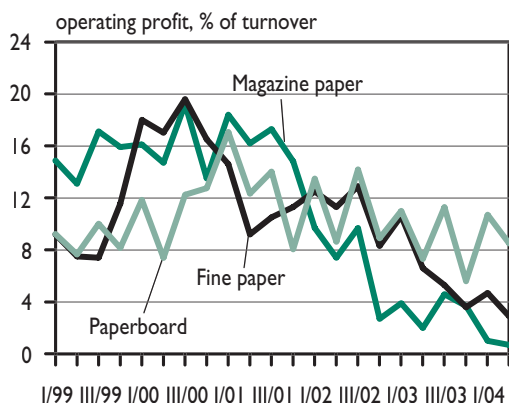
Despite the clear growth in production and exports, the combined turnover of Stora Enso, UPM-Kymmene and Metsäliitto Group grew by only 0.5% in the first half of 2004, because of the

low export prices. The profitability of these forest industry corporations continued to deteriorate, and their combined half-year profits before extraordinary items totalled approximately EUR 0.4 billion, compared with EUR 0.6 billion for the same period in 2003.

The profitability trend in the forest industry corporations' paper and sawmilling units worldwide is shown by product group in the accompanying diagrams. However, the assessments presented below concerning the production costs and profitability of the Finnish forest industry in 2004 and 2005 deal only with domestic production.

Production and export volumes in the Finnish pulp, paper and paperboard industries were up slightly in 2003, despite the poor price trend. The combined export income of these industries was EUR 8.9 billion, which was 5% below the previous year's figure because of the sharp decrease in export prices. No such drop was seen in costs, however, and so there was a significant drop in profitability in the paper and paperboard industries.

The paper industry's profitability weakened further in the first half of 2004, as paper prices fell, although there was an increase in production and export volumes and the capacity utilisation rate rose



Sources: Annual and interim reports of UPM-Kymmene, Stora Enso, M-real and Finnforest

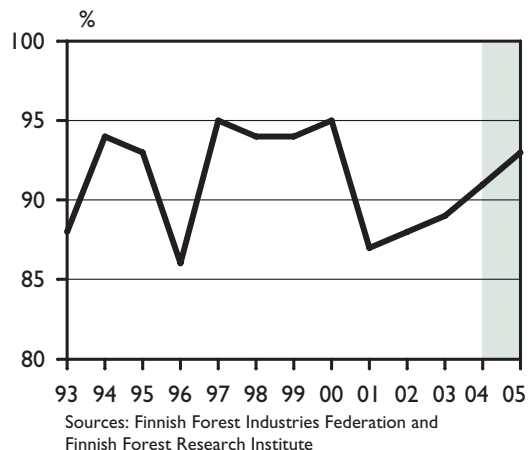
Forest industry operating profit by product group, Q1/1999–Q2/2004.

to 91%. The Finnish pulp, paper and paperboard industries' export income in the first six months of 2004 totalled EUR 4.5 billion, which was about the same as the previous year. The total export volume of the paper and paperboard industries in 2004 is expected to be up by 8% on the 2003 figure, but the average export price will probably be 4–5% down on the previous year's level. No improvement in the paper and paperboard industries' profitability is expected in 2004, however, because there are also upward pressures on the costs of production inputs such as oil-based raw materials, labour, roundwood harvesting and transportation.

Profitability in pulp production is expected to be up slightly in 2004 as a result not only of the rise in production volumes and the capacity utilisation rate but also a moderate increase in the average export price of pulp for the year. The price of softwood pulp has been significantly above the 2003 level, whereas the price of hardwood pulp has fallen.

Profitability in the Sawmilling Industry Continues to be Weak

In 2003, falling export prices meant that the export income from sawnwood, plywood and other wood products was unchanged from the previous year, at EUR 2.6 billion. The sawmilling industry's profitability thus deteriorated, leading to a negative net profit for 2003. Although production and export volumes of Finnish sawnwood and plywood increased in the first six months of 2004, the drop in prices meant that the export income for the entire wood products industry was about the same as in the first half of 2003, at EUR 1.4 billion. With the export volume of sawnwood forecast to be up in 2004 by only 1% on the previous year's figure and sawnwood export prices expected to be down, the sawmilling industry's 2004 export income will not rise above the previous year's figure, and the industry's profitability will continue to be weak. A major factor in the poor profitability of the sawmilling industry is the high price of wood raw material in Finland.



Paper and paperboard industry capacity utilisation rates, 1993–2005

Production and export volumes in the Finnish plywood industry in 2004 are expected to be up by an average of 4%. The profitability of production should also improve, as softwood plywood production capacity is projected to be in full use in the latter half of 2004 and the trend in prices is expected to improve. The profitability of birch plywood production has been supported by the lower price of birch sawlogs compared with 2003.

2004 Roundwood Costs Reduced by Drop in Stumpage Prices

Wood raw material comprises about one third of total manufacturing costs in the wood products industry, and about 13% in the pulp and paper industry. The figures cover all sections of these industries, including the manufacture of processed products. In some sections, wood raw material costs account for a considerably higher proportion of total manufacturing costs: in sawmilling, for instance, they account for over half of total costs. The Finnish forest industry's roundwood costs are made up of the stumpage, harvesting, transportation and procurement costs of domestic roundwood, plus the costs of foreign imported roundwood.

For the wood products industry, stumpage costs are the most important individual cost element, accounting for about one quarter of total costs. By contrast, stumpage costs account for only 4–5% of total costs in the pulp and paper industry. Average stumpage prices are expected to be down in 2004, as pulpwood stumpage prices are projected to be around 3–9% (depending on species) below the average prices for 2003. The average price of birch sawlogs – a raw material for the plywood industry – is also expected to be down. Price movements for softwood sawlogs, on the other hand, are expected to remain relatively small, because high sawnwood production volumes have maintained the industry's brisk demand for sawlogs in 2004.

The costs of roundwood harvesting and transportation constitute about 7% of total costs in the wood products industry and about 3% in the pulp and paper industry. These costs have risen significantly since 2003. According to figures from Statistics Finland, forwarder and harvester costs rose by 3%, and transporter costs by 5%, between August 2003 and August 2004.

The combined effect on roundwood costs of the drop in stumpage prices and the rise in roundwood harvesting and transportation costs in 2004 is expected to be more or less unchanged in the sawmilling industry compared with 2003, while in the paper industry their combined effect should mean a minor reduction in costs.

Forest Industry Pay Settlement Will Raise Pay at the Same Rate as Recent Years

Labour costs are equivalent to almost 15% of the pulp and paper industry's total output and some 17% of total output in the wood products industry. Under the pay settlements that apply up to March 2005, labour costs in the Finnish forest industry rose by 2.7–2.9% in 2003, and by a further 2.2% in March 2004. In practice, these contractual increments are supplemented by local site-specific increments. Following local increments of 1–1.5% in the different

forest industry sectors in recent years, labour costs in the forest industry in 2004 are expected to be up by about 4%.

Labour productivity increased by 4.6% in the pulp and paper industry and 2.7% in the wood products industry in 2003, according to figures from Statistics Finland. Labour productivity is expected to be up in 2004 by as much as 10% in the pulp and paper industry and by 3% in the wood products industry, due to the forecast production growth and labour force reductions. As a result of higher pay but fewer jobs, real labour costs in the pulp and paper industry are forecast to remain unchanged in 2004, and to rise by nearly 2% in the wood products industry.

Large Fluctuations in Energy Prices

Energy costs account for about 8% of total production costs in the Finnish pulp and paper industry, and 2.5% in the wood products industry. The majority of the energy costs are from electricity consumption, though the high degree of self-sufficiency in energy production has a stabilising effect on energy costs. In 2003, the forest industry consumed 26.2 billion kWh of electricity, of which 43% was produced by the industry itself. The high degree of self-sufficiency means that price fluctuations in market electricity have a relatively smaller effect on energy costs in the paper and sawmilling industries than would be expected.

The average price of market electricity in the first half of 2004 was EUR 29 per MWh, or almost 30% less than in the same period the previous year. The price of market electricity for the full year is expected to average about EUR 31, which is about 10% below the previous year's level.

Fuel totalling 270 000 TJ was used in the forest industry's own electricity and heat production in 2003, up by 7% on 2002. Wood accounted for 73% of this fuel input, natural gas for 16%, peat for 6% and heavy fuel oil for 5%. Compared with the previous year, the use of wood was higher but the use of fuel oil a little lower. The price of natural gas in the first quarter of 2004 was down by about 6% on the

same period in 2003. The price of peat has risen by a total of about 3% in two years.

Oil Prices Indirectly Reflected in Forest Industry Costs

The price of crude oil has risen sharply in 2004, from USD 30 at the start of the year to over USD 50/barrel in October. Oil prices are forecast to remain high during the remainder of 2004. Both Nordea and the Research Institute of the Finnish Economy forecast that the average oil price for the full year will be USD 36–38/barrel, which is about 30% higher than in 2003.

The rise in crude oil prices mainly has an indirect effect on forest industry costs via its impact on freight and other transportation costs, the prices of chemicals and pigments, and harvesting costs. The rise in costs of imported inputs in 2004 has been eased by the strengthening of the euro against the US dollar.

The increase in sea freight charges that began in 2003 continued throughout the year. The Baltic Dry Index (BDI), measuring dry cargo spot prices, was about 80% higher at the end of August 2004 than one year earlier, and sea freight charges are expected to remain unchanged during the final months of 2004.

Oil price fluctuations are reflected in the prices of pigments and forest industry chemicals via their impact on manufacturing costs. The prices of basic chemicals did not rise during the first half of 2004 and are likely to remain at the level of 2003. Chemicals account for about 7%, and pigments 3%, of production costs in the pulp and paper industry.

Moderate Increase in Costs in 2005

No significant upward pressure on the Finnish forest industry's production costs is anticipated in 2005. Neither are major changes expected in the euro exchange rate, which will help stabilise prices of imported goods. The rise in oil prices is expected to slow down, which will curb price increases in a number of production factors. Subdued GDP growth

in the euro area and the slight rise in interest rates will also keep inflation low.

The main item of rising costs for the Finnish forest industry is wages and salaries. Taking into account the contractual increments and wage adjustments, wages and salaries are forecast to be up by about 3% in 2005. In the pulp and paper industry, the increase in labour productivity of about 5% means that real labour costs will nevertheless remain unchanged, despite the rise in earnings. The increase in labour productivity will not be as high in the wood products industry, and so its real labour costs are forecast to increase by almost 2% in 2005.

Stumpage prices are expected to remain at more or less their 2004 level, and roundwood harvesting and transportation costs are also likely to remain unchanged. A slight rise in labour productivity in forestry will also help reduce the effect of the pay increments on labour costs. Mill prices of roundwood are therefore not expected to rise in 2005.

The average price of crude oil in 2005 is forecast to be only a little below the 2004 average. Most of the forecasting institutions expect the average oil price to settle at USD 35–40/barrel. This assumes stability in the markets and in production conditions. Chemical and pigment prices are not expected to rise until there is a clearer increase in the demand for them.

The price of market electricity will be heavily dependent on water reserves in the Nordic countries and on the level of power consumption in the coming winter. The price of market electricity in 2005 is forecast to be at the 2004 level.

A new addition to the forest industry's costs in the near future will be the costs of greenhouse gas emissions trading. The biggest costs involved will be the purchase of emission allowances and the rise in electricity prices. Greenhouse gas emissions trading is not expected to have any appreciable affect on electricity prices and forest industry costs in 2005.

Pulp and Paper Industry Profitability to Improve in 2005

Profitability in the Finnish forest industry is affected most of all by the prices of end products. With demand growing on the export markets, export prices of Finnish pulp and paper industry products are forecast to rise in 2005 by an average of 2%. Similarly, paper and paperboard production and export volumes are expected to rise, as are capacity utilisation rates. Pulp production volumes are also expected to increase in 2005, bringing pulp production capacity into full use. With no significant increase in production costs expected in 2005,

profitability in the Finnish pulp and paper industry is forecast to improve, along with corporate profits.

Production and exports in the sawmilling industry in 2005 are expected to be almost at the high level of 2004. Sawnwood export prices are forecast to drop slightly and export income to fall a little as a consequence. No major changes are expected in sawmilling costs, and so the industry's profitability will again be weak in 2005. Profitability in the plywood industry is forecast to remain at the 2004 level. Plywood production and export volumes are expected to fall a little, but the export prices of softwood plywood and birch plywood are forecast to remain at about the level of 2004.

3 Forestry in Finland

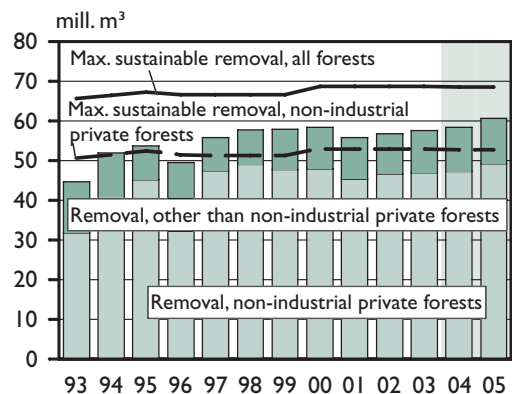
3.1 Utilisation of Wood Resources

Finland's abundant forest resources are sufficient to meet the Finnish forest industry's demand for roundwood, with the exception of birch. The industry's demand for birch is some 40% higher than the estimated maximum sustainable removal will allow, and this shortfall is made up by imported birch. In 2001–2003, the forest industry's roundwood consumption and commercial fellings were at record highs, with consumption averaging 71 mill. m³ of roundwood a year, of which 55 mill. m³ was of Finnish origin. The level of roundwood procurement and consumption in the industry will be up slightly in 2004 and also in 2005.

Finland has 23 mill. ha of forest, and the total volume of growing stock is approximately 2050 mill. m³. Pine accounts for 47% of this, spruce for 34%, birch for 15% and other broad-leaved species for 4%. The annual increment in the growing stock is about 83 mill. m³. Some 2.8 mill. ha of forest, mainly in Northern Finland, are wholly or partially excluded from commercial roundwood production. Forestry can thus be practised across an area of more than 20 mill. ha, containing a growing stock of about 1900 mill. m³ with an annual increment of approximately 81 mill. m³. Growing stock drain amounts to about 69 mill. m³ p.a., and so roundwood reserves are increasing annually by a small amount. The standard of Finnish forest management has been endorsed by the Pan European Forest Certification scheme.

The maximum sustainable removal is approximately 69 mill. m³ of useful wood per year, and the maximum justifiable in silvicultural terms is as much as 93 mill. m³, taking account of all tree species. The removal of roundwood meeting the dimensional requirements for industrial wood in recent years has been about 57 mill. m³, or 83% of the calculated maximum sustainable removal. In non-industrial private forests, the proportion of the maximum sustainable removal harvested has been almost 90%.

Some 62% of Finland's commercial forests are in the possession of non-industrial private owners, 24% are owned by the state, 9% by companies and 5% by other groups of owners. The state's forest ownership is concentrated in Northern Finland, which is reflected in the low average increment in the growing stock compared with forests in other ownership. Forests in non-industrial private ownership account



Source: Finnish Forest Research Institute

Removals of industrial wood and maximum sustainable removal

Wood consumption by the forest industry and maximum sustainable removals in Finland

Tree species	Consumption 2001–2003, mill. m ³ /yr		% of maximum sustainable removal	
	Domestic wood	Wood total	Domestic wood	Wood total
Pine	23.6	26.3	74	82
Spruce	24.8	28.2	103	117
Birch	6.4	13.7	63	136
Total	54.8	68.2	83	103

In addition, the industry consumed 2.5 mill. m³/yr of aspen and unspecified imported wood.

for 72% of the growing stock increment, state-owned forests for 12%, company-owned forests for 11% and the rest for 5%. From the viewpoint of the industry's roundwood procurement, the non-industrial private forests are of crucial importance, as about 80% of the domestic roundwood (and about 65% of all roundwood, both domestic and imported) used by the forest industry is from such forests. However, this proportion has been slowly declining as imports have risen; imported roundwood now accounts for about 20% of the total.

The table shows the Finnish forest industry's consumption of roundwood, and compares these figures with the maximum sustainable removal estimated for Finnish forests. The calculation of maximum sustainable removal is based on information about the amount, composition and annual increment of the growing stock and assumes that the standard of silviculture will remain unchanged. The calculation indicates the level to which fellings could rise without prejudicing the size of future removals.

The level of maximum sustainable removal has risen because the volume of growing stock has been rising continuously and silviculture has been quite intensive. The additional funding from the National Forest Programme will help secure a high level of silvicultural investment. The increase in maximum sustainable removal has slowed, but with the present

use of roundwood resources the maximum sustainable removal will increase again in the future.

Felling in excess of the maximum sustainable removal on a temporary basis only will not jeopardise future harvests. Flexibility of this kind, which is justifiable in silvicultural terms, is extremely widespread in Finnish forests, especially in spruce stands. In spruce-dominant forests in Southern Finland, the average volume of growing stock is high, at 173 m³/ha. Spruce harvests have been very high in recent years and spruce reserves have no longer been increasing.

From a wood resources viewpoint, pine has the best potential for quickly meeting an increase in the demand for roundwood. The industry's birch consumption is currently almost 40% greater than the level of maximum sustainable removal in Finnish forests will allow, and the shortfall is imported as birch pulpwood. The proportion of birch resources harvested is not very high, as birch procurement is hampered by the fact that a significant proportion of birch grows in softwood-dominant forests; only 9% of Finnish forests are birch-dominant. The table also shows that domestic spruce resources are being used to the full. Imports of spruce in recent years have been running at 3–4 mill. m³ p.a. According to the maximum sustainable removal calculations, spruce harvests can be sustainably increased in as little as about ten years from now.

Non-industrial use of roundwood – principally household firewood – is also of importance in forest management terms, but its main significance is in terms of energy use. In the tending of young stands, a growing volume of small-sized trees are chipped into fuelwood. The significance for forest management may grow if stands marked for first thinning no longer attract the interest of wood purchasers.

The aim of the National Forest Programme (1999) is to increase the use of domestic industrial wood and fuelwood (particularly felling residues). The use of industrial wood has not yet increased, but the use of felling residues and small-sized trees for energy purposes has tripled since 1999. In energy production, the use of wood material unfit

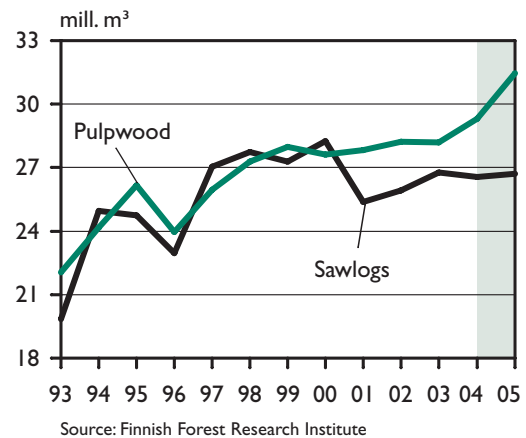
for industrial products is very high: wood-based energy accounts for 20% of all energy consumed in Finland and 60% of the Finnish forest industry's energy consumption.

3.2 Roundwood Markets

Production forecasts indicate that the Finnish forest industry's roundwood consumption in 2004 will be up by 5%, to 77 mill. m³. The increase in imports is expected to be insufficient to satisfy the industry's need for roundwood, and so commercial fellings will have to increase as well. The latter will need to rise to a total of 56 mill. m³ by the end of 2004, even assuming that almost 2 mill. m³ of already harvested roundwood stocks are used. Stumpage prices in 2004 will be 3–4% below the 2003 figures, mainly on account of lower pulpwood prices. Roundwood consumption will continue to increase in 2005, to a level exceeding 78 mill. m³. Average softwood sawlog prices are expected to remain at the 2004 level, while softwood pulpwood prices will rise slightly. Little room will be left for reducing stocks in 2005, and so the roundwood need will have to be met by importing an additional 1 mill. m³ and by increasing commercial fellings of pulpwood by 2 mill. m³.

Purchase Volumes Below Target, Fellings Unchanged

Production in the Finnish pulp and paper industry increased in the first six months of 2004, and sawnwood production remained high. The industry's need for pulpwood has therefore increased, in particular. The drop in stumpage prices that began in summer 2003 led to a reduction in roundwood sales in the subsequent autumn, with the result that the forest industry's roundwood procurement in 2003 fell short of the target by 6 mill. m³. Roundwood sales in

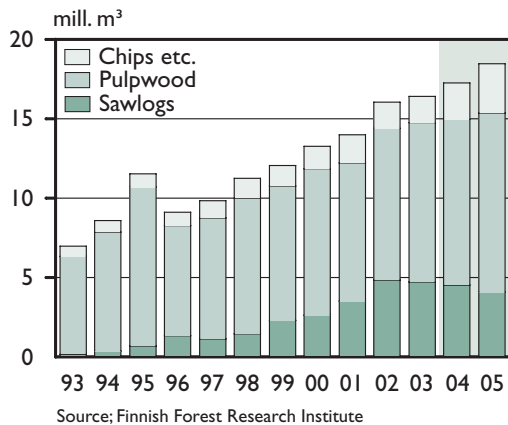


Commercial fellings of sawlogs and pulpwood, 1993–2005

2004 have been comparatively slow in relation to the industry's purchase target of 47 mill. m³ announced at the start of the year, but sales have begun to pick up in September.

Despite purchase volumes being 9% down, fellings in non-industrial private forests (28.5 mill. m³) in January–August 2004 dropped by only 1%, and the total volume of commercial fellings was less than 1% down on the same period in 2003. With commercial fellings down a shade, the increased fibre raw material need in pulp and paper production has been met by higher imports of wood chips and spruce pulpwood, and by using stocks of harvested roundwood.

The decline in stumpage prices that began in July 2003 continued for the remainder of the year. In 2004, however, stumpage prices have been fairly stable: by the end of September, stumpage prices for pine and birch had fallen by less than 1%. By contrast, the price of spruce sawlogs had risen by 4% and spruce pulpwood by about 2%. During the month of September, the stumpage prices of all types of roundwood grew by 1–3% on their August levels.



Volume of imported wood by type of roundwood, 1993–2005

No Increase in Imports in First Six Months

Overall, roundwood imports have been below the level anticipated, totalling 10 mill. m³ by the end of July 2004, which is 1% below the previous year's figure for the same period. A change in the structure of imports has occurred during this period, with an increasing emphasis on wood chips (including wood residues); imports of wood chips increased by 32% (0.28 mill. m³) in the first half of 2004.

With the forest industry's consumption of wood raw material growing at a faster rate than roundwood sales and imports in the first half of 2004, there has been a decline in the reserves of marked stands, in particular. The industry's stocks of harvested wood have also been reduced, falling by 1.3 mill. m³ in January–June, to 7.6 mill. m³. This is 7% below the average summer reserves of the past five years.

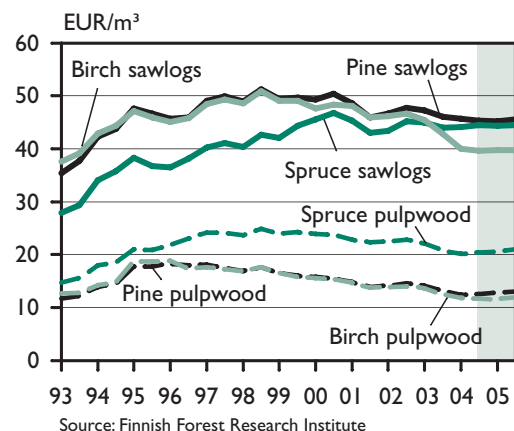
Roundwood Sales Must Pick Up in Autumn 2004

Based on the Finnish forest industry's production volumes in the first six months, its use of roundwood in 2004 as a whole will rise to a new record (77 mill. m³), of which 47 mill. m³ will have to be

met by roundwood production from non-industrial private forests. To achieve this target, late-autumn roundwood sales must pick up substantially.

Average stumpage prices of softwood sawlogs in 2004 are not expected to fall below the previous year's level, because high production volumes are keeping up the demand for sawlogs. On the plywood market, production in Russia and the other transition economies will ensure that competition remains tough. Consequently, the 2004 stumpage price of birch sawlogs is forecast to be about 10% down on the previous year's level; the same applies to the stumpage prices of pine and birch pulpwood. Although the growth in pulp and paper production has raised demand for fibre raw material, domestic purchases in the first half of 2004 were significantly lower than those for the same period the previous year. The price of spruce pulpwood has decreased in 2004, but by less than other pulpwood grades. The growth in magazine paper production has nevertheless increased the demand for spruce pulpwood, which, because of the decline in domestic sales, has had to be met by increasing imports.

Unless roundwood sales pick up in autumn 2004, production restrictions will have to be introduced on account of the raw material shortage. If stumpage



Semiannual stumpage prices by type of roundwood, Q1/1993–Q2/2005 at 2003 prices (cost of living index)

Forecasts of commercial fellings and roundwood imports, 2003–2005.

Roundwood type/ Ownership group	2003 mill. m ³	2004 mill. m ³	Change %	2005 mill. m ³	Change %
Commercial fellings, total	55.0	55.9	2	58.2	4
Non-industrial private forests ¹	46.7	47.1	1	49.2	4
Company-owned forests	3.5	3.8	9	3.9	2
Finnish Forest and Park Service forests	4.8	5.0	3	5.1	2
Sawlogs	26.8	26.6	-1	26.7	0
Pulpwood	28.2	29.3	4	31.5	7
Roundwood imports ²	16.4	17.2	5	18.4	7
Commercial fellings and roundwood imports, total	71.4	73.1	2	76.6	5
Stocks of harvested roundwood	8.9	7.2	-19	7.8	7

¹ Includes municipalities, parishes, etc.

² Excluding firewood

prices were to be increased, the profitability impact would not be as significant in the pulp and paper industry as in the wood products industry, because stumpage prices represent a significantly smaller proportion of the total costs of pulp and paper products. Bearing in mind, too, the improved outlook for export prices of softwood pulp and magazine paper in 2005, one solution to the impending raw material shortage would therefore be to introduce a moderate increase in the price paid for softwood pulpwood. The smaller diameter requirements for spruce pulpwood introduced by roundwood purchasers have also been a step in the same direction. If autumn 2004 continues to be wet and mild, and the ground therefore still very soft and unfrozen, fellings will have to be concentrated on final cutting stands next to roads that can support the heavy loads, but the availability of such stands is limited. This increases the prospect of having to restrict production on the basis of roundwood procurement problems.

Roundwood Consumption at a Peak in 2005

Production forecasts indicate that the Finnish forest industry's roundwood consumption in 2005 will rise by about 2%, to over 78 mill. m³. This additional demand is expected to be covered by an increase in imports (to a total of 18.5 mill. m³) and in commercial fellings from non-industrial private forests (to a total of 49 mill. m³). The 2 mill. m³ increase in fellings would consist primarily of pulpwood, as sawnwood production and sawlog needs will be unchanged from the previous year.

Although high sawnwood production volumes will maintain the good level of demand for sawlogs, no increase in stumpage prices is expected in 2005. This is because sawnwood prices are being held down by the oversupply on sawnwood export markets, thus restricting the sawmilling industry's scope for paying higher sawlog prices. With birch plywood prices expected to rise slightly in 2005, the fall in birch sawlog prices should come to an

Forest Product Export Price Index and Stumpage Price Index

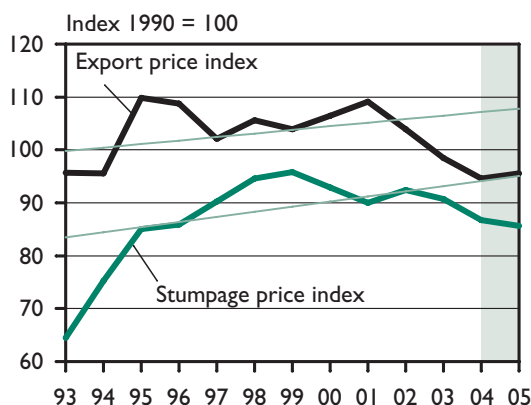
Pekka Ollonqvist

The forest product export price index, which measures the real change in forest product export prices, will be down in 2004 by over 3.5% on the previous year's level, because export prices have fallen for all forest products except pulp. The stumpage price index, which measures the average price of roundwood, will be down by over 4%. Both indices are based on prices adjusted for inflation using the wholesale price index.

With nominal export prices for pulp and paper industry products rising slightly, the forest product export price index is expected to rise in 2005 by about 1% on the 2004 level. The stumpage price index will fall by over 1%, despite an end to the decline in nominal stumpage prices. In 2005, the forest product export price index will be more than 4% lower than its 1990 level, while the stumpage price index will be about 14% below its 1990 level.

Both indices have experienced a rising trend throughout the period 1990–2003. The forest product export price index has risen more slowly than the stumpage price index, the difference being about 0.4 percentage points. The stumpage price index in 2003 was over 2.5% below its linear trend calculated for the period 1990–2003, and the forest product export price index was about 7.5% below its linear trend for the same period. For both indices, the deviation from the trend has continued to increase during 2004.

The forest product export price level rose continuously from a minimum in 1991 up to the year 2001, but has since fallen significantly. In 2005 it will be at almost its 1992 level. After the low of 1993, a recession year, stumpage prices rose continuously in real terms until 1999. Stumpage prices in 2005 will be slightly below their 1996 level.



Sources: Research Institute of the Finnish Economy,
Finnish Forest Research Institute and Statistics Finland

Forest product export price index, stumpage price index and their linear trends (inflation-adjusted by the wholesale price index)

end. On the pulpwood market, the expected rises in the production and export prices of softwood pulp and printing and writing papers is forecast to lead to a 4% increase in the price of pine pulpwood and to reinforce the trend in birch pulpwood prices to some extent.

3.3 Investment and Profitability in Non-Industrial Private Forestry

Total investment in timber production in Finnish non-industrial private forestry in 2004 will be almost EUR 170 mill. In 2005, investment will be slightly higher but nevertheless considerably below the level seen in the early years of the decade. By contrast, state funds for management of the forest environment in non-industrial private forests have increased by almost 50% during the current decade. In 2005, state funding for these purposes will amount to nearly EUR 6 mill.

Net stumpage earnings in 2004 will be down by EUR 4/ha on the previous year's figure, to EUR 97/ha, but will rise in 2005 to EUR 101/ha. Profitability, calculated as the investment return on forest ownership, has weakened during 2004 as a result of the fall in stumpage prices, and the return in real terms will be negative, at -1%. In 2005, the return is expected to rise to over 4%, a level equal to the 1993-2003 average.

Drop in Timber Production Investment

The amount of timber production investment funded by forest owners themselves increased in real terms almost continuously from the first half of the 1990s to the start of the current decade. However, since 2001 this level of financing has been on the decline. In the last two years, the extent of artificial regeneration has fallen by almost 10%, and the tending

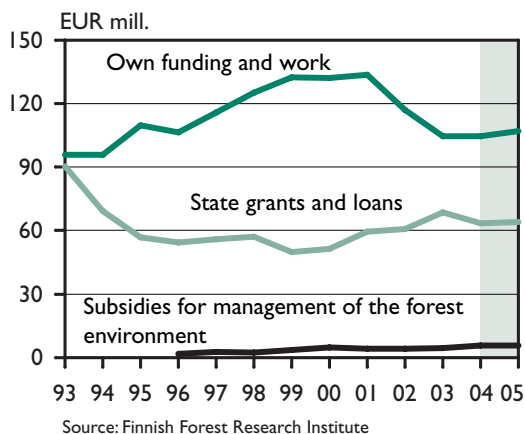
of young stands by over 5%. These two areas correspond to over two thirds of the total investment in timber production in non-industrial private forestry. In 2003, the amount of funding by private forest owners themselves amounted to about EUR 105 mill., and will be almost the same in 2004. In 2005, this figure will be slightly higher, but nevertheless below EUR 110 mill.

Almost EUR 70 mill. of state funding was used for timber production in 2003. The focus of this funding was on the tending of young stands, which is work that also requires a substantial amount of funding and work input from forest owners themselves. Total investment in non-industrial private forestry in 2003 rose to about EUR 173 mill., whereas in 2004 it will be just under EUR 170 mill. In 2005, investment will be up slightly in real terms.

Decline in State Subsidies

The real level of state subsidies in 2003 marked a return to the position of ten years ago. This high subsidy level was the result of a supplementary budget of EUR 9 mill. to help finance work on the tending of young stands that was postponed from 2002. In 2004, the level of state subsidies is again at around EUR 63 mill. The Government's budget proposal for 2005 reserves a total of approximately EUR 64 mill. in grants and loans for timber production in non-industrial private forestry. In the 1990s, loan financing lost its importance almost completely, and in the current decade only about EUR 0.5 mill. annually has been given in loans.

In non-industrial private forestry, state subsidies are now allocated not only to timber production but also for furthering the management of the forest environment. A separate allocation is reserved for this purpose in the budget; the first such allocation (almost EUR 2 mill.) was made in 1996. In less than ten years the funding used for management of the forest environment has tripled. The Government's budget proposal for 2005 contains an allocation of almost EUR 6 mill., which is about the same as the subsidies for forest roads.



State and forest-owner funding of investments in non-industrial private forestry, 1993–2005 at 2003 prices (cost of living index)

Decline in Stumpage Earnings

Stumpage earnings of non-industrial private forest owners were about the same in 2002 and 2003, at about EUR 1.55 billion. This is significantly below the stumpage earnings level of 1997–2000 in real terms. In 2004, it appears that gross stumpage earnings will drop by 3–4%, to less than EUR 1.5 billion, as a result of the lower stumpage prices for all roundwood categories except spruce sawlogs. In 2005, the improved economic situation for the Finnish forest industry will also be evident in the roundwood market, which will mean rising stumpage prices and an increase in felling volumes. Gross stumpage earnings of non-industrial private forest owners will thus return to the level of 2002–2003.

In 2003, total investment in timber production in non-industrial private forestry was more than 11% of gross stumpage earnings. The investment rate for 2004 looks likely to be down slightly on the previous year. Both earnings and investment are forecast to rise in 2005, resulting in an investment rate of a little over 11%.

Net Earnings Remain at Around EUR 100/ha

Gross stumpage earnings in 2004 will be down by EUR 3/ha to EUR 112/ha, due to the fall in stumpage prices. In 2005, the increase in fellings and the modest price rise in softwood pulpwood grades are expected to raise gross stumpage earnings to EUR 115/ha. Total costs (investment plus management) of non-industrial private forestry are expected to increase a little in 2004, to about EUR 20/ha, and to remain at this level in 2005.

Net earnings from non-industrial private forestry in 2003 amounted to EUR 101/ha. In 2004, net earnings will be EUR 97/ha, due to the lower stumpage prices. With costs remaining unchanged, the additional fellings and the small increase in stumpage prices are expected to raise net earnings in 2005 to EUR 100/ha.

Non-industrial private forestry balance sheet calculation for 2003 and forecast for 2004–2005. EUR/ha

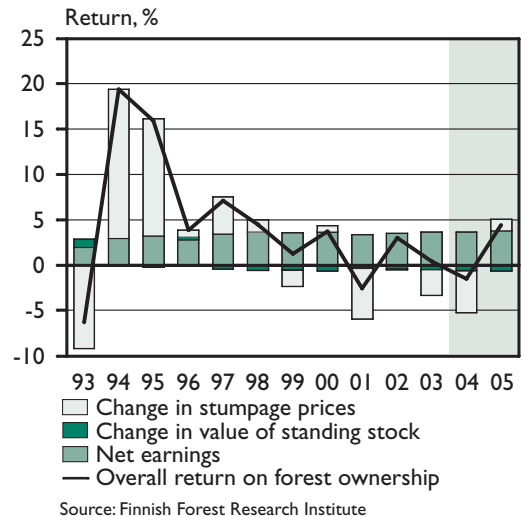
	2003	2004	2005
Gross stumpage earnings			
Whole country	115.3	112.0	115.0
Southern Finland	148.7	145.0	149.0
Northern Finland	46.5	43.0	46.0
– Gross costs			
Whole country	19.4	19.6	19.9
Southern Finland	22.7	23.0	23.3
Northern Finland	12.4	12.5	12.7
+ Subsidies			
Whole country	5.1	4.8	4.7
Southern Finland	5.1	4.7	4.6
Northern Finland	5.2	4.9	4.8
= Net earnings (before taxes and external capital costs)			
Whole country	101.0	97.0	100.0
Southern Finland	131.0	127.0	131.0
Northern Finland	39.3	36.0	38.0

Northern Finland is defined as the Provinces of Oulu and Lapland
Sources: Statistics Finland and Finnish Forest Research Institute

Return on Forest Ownership to be Over 4% in 2005

Based on average stumpage prices, the 2003 return on forest assets calculated in terms of the harvest value was 0.4%. In 2004, the fall in stumpage prices will mean a return of -1.5%, while in 2005 the slight rise in stumpage prices will produce a return of over 4%. The real investment return on forest ownership in the period 1993–2003 was an average of 4.6%.

The overall return on forest ownership is made up of several factors: stumpage earnings minus the costs of timber production (= net earnings); the change in value of the standing stock; and the change in stumpage prices. The variation in stumpage prices has a decisive effect on the harvest value of the standing stock (volume of standing stock x stumpage price by roundwood type), which can occasionally cause even large fluctuations in the percentage return. In the calculation of harvest value, which describes the value of forest assets, the volume of the standing stock is based on the annual



Overall real return on forest ownership, 1993–2005 (cost of living index)

growing stock volume calculated on the basis of the national forest inventories and felling volumes, and average annual stumpages prices are used.



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The Potential for Exporting Finnish Wood Products to China

Raija-Riitta Enroth and Ritva Toivonen

Finding new markets is particularly important to Finland's mechanical forest industry because of the oversupply of sawnwood and wood-based panels in Europe. China's rapid economic growth and its huge population make it an attractive export destination. The Finnish Forest Research Institute and the Pellervo Economic Research Institute (PTT) have completed a joint study of the potential for exporting Finnish wood products to China. The study was based on statistics, published material and interviews with Finnish and Chinese experts.

China's GDP has been growing in recent years by an average of 7% p.a., and growth is expected to continue at a high level in the years to come. China's membership of the World Trade Organisation (WTO) in 2002 has accelerated foreign investment in the country, and China has already surpassed the United States as the biggest recipient of foreign investment. Its foreign trade is also growing strongly. For example, exports in the first half of 2004 were up by about 35%, and imports by about 43%, on the same period the previous year.

China's Forest Resources Insufficient to Meet its Forest Industry Needs

The forested areas of the People's Republic of China cover approximately 163 mill. ha, which is about the same as in the 25-member European Union. However,

China's population is approximately 1.28 billion, or about one fifth of the world's population (for comparison purposes, the total population of the EU is now almost 500 mill.). The majority of China's forests were converted to cultivation or pasture centuries ago, which, in turn, has led to erosion and desertification. The importance of forests in combating erosion has been acknowledged in recent years, and tree-planting projects are turning parts of China green again. However, with erosion protection being the main purpose of these afforestation projects, and with felling bans being imposed on certain areas of natural forest in the late 1990s, it is clear that China's forest resources are insufficient to meet the needs of its forest industry.

China is now the world's largest importer of tropical wood, and its roundwood imports from Russia have also increased greatly in recent years. China is also a net importer of almost all forest industry products, and about half of the value of these imports consists of pulp and paper products. In China's forest industry exports, the biggest items are furniture and joinery products. Demand for low-cost Chinese wood products has grown rapidly worldwide, and production is continuing to increase. The United States, for instance, has had to cut back its own furniture production because this has become unprofitable as a result of Chinese imports, and European producers have also lost markets. About half of all US furniture imports by value are from Asia, the majority being from China.

On the other hand, China is a clear net importer of sawnwood and wood-based panels, both needed as raw materials for its wood products industry. In 2002, China's sawnwood imports totalled 5.4 mill. m³ and its sawnwood exports 0.4 mill. m³. Imports and exports of wood-based panels in the same year were 3.5 and 2.1 mill. m³, respectively.

In 2003, Finnish exports of forest industry products to China had a total value of only about EUR 127 mill. Most of these products were from the pulp and paper industry. Finnish exports of wood products to China have so far been very low: only 57 000 m³ of sawnwood and 2000 m³ of plywood were exported there in 2003. By comparison, Finnish sawnwood exports to Japan have more than doubled in the past ten years, with exports in 2003 being a little over 1 mill. m³.

Growing Construction Industry Demand in Cities

About 60% of China's inhabitants still live in rural areas, but urbanisation is proceeding rapidly. Efforts are being made to reduce the enormous income disparities between different parts of the country, and especially between urban and rural areas, by, for example, relocating poor rural dwellers to the cities. It is estimated that the rationalisation process under way in agriculture and in enterprises throughout the country could release up to hundreds of millions of people, most of them wishing to live in towns and cities.

While previously the Chinese housing market was almost exclusively the domain of the state and work units (which had to provide homes for their employees), since 1990 employees have been allowed to buy homes offered by their employers at well below the market price. Added to this, the housing market was completely reformed in 1998: new job-related dwellings are no longer available; publicly owned housing has been privatised; property construction companies' access to the market is now easier; and the banks' housing loan system now allows housing loans to private households. China's housing market has been completely transformed. In Beijing, for example, about 80% of residential property sales consist of privately acquired homes. Owner occupation is spreading very rapidly in urban areas.

The available figures and assessments concerning the volume of housing production are to some extent conflicting. What is clear, however, is that there is substantial growth in housing production in China. Some US sources estimate that the number of new homes built in China in 2001–2005 will total 62.6 mill. Construction needs especially in towns and cities have grown and will continue to grow.

Demographic developments under way in China include a vigorous expansion of the middle class. The size of the Chinese middle class has roughly quadrupled in five years, which means many millions joining the ranks of the better-off every year. At the end of 2000, the middle class constituted an estimated 150 mill. people, or nearly as much as the entire population of Russia. Middle-class income levels in Asia are, however, considerably below those of Western countries, but the purchasing power of the population is growing nevertheless.

Many Obstacles to the Use of Wood in Construction

Urbanisation means that apartment block construction will remain the most important form of residential construction in China. The authorities have favoured the use of materials other than wood in urban construction, mainly for fire safety reasons. Nearly every town and city in China has a very high population density, and fire is therefore a major threat. The need to build multi-storey apartment blocks because of the huge population has also increased the use of concrete and brick. Residential buildings in urban areas are generally at least six stories high.

Wood-based construction is nowadays also avoided because architects and developers know little about it, residents are unfamiliar with it, its durability and safety compared with concrete are questioned, and pest damage is a danger in southern parts of the country. Moreover, the existing building regulations contain no guidelines on wood-based construction.

In autumn 2004, a group of producer countries (Finland, Sweden, Norway, Austria, Germany and France) embarked on a collaborative effort to increase the use of wood in construction, aimed at actively promoting the use of wood in China and Japan. Spe-

cific projects in China include promotion of wall and ceiling systems and the publication of a handbook on wood-based construction. Efforts are also being made to gain approval for the use of European stress graded wood in construction.

Although the majority of residential buildings are apartment blocks, an increasing number of detached houses and other low-rise buildings have also been constructed in urban areas. Such buildings were already making an appearance in the 1980s in Shanghai, Beijing and other major cities, but the numbers were very few. The real 'low-rise boom' began in the late 1990s, when detached and other low-rise housing was seen as a visible sign of personal success.

Spending on Home Decoration and Furnishing

Most new homes sold in China are devoid of any interior fittings or fixtures, which leaves the new owners to buy everything themselves, beginning with floor, wall and ceiling materials. It is believed that this practice will continue in the future, too, as it allows buyers to fit out their new homes according to their own taste, timetable and budget.

The practice has also led to a sharp increase in the number of companies selling interior decorating and furnishing supplies. Ikea, based in Beijing, is a good example of this, but Germany's OBI and the UK's B&Q have also arrived on the Chinese market.

Dark hardwoods have traditionally been favoured in Chinese interiors. However, light-coloured wood has begun to gain a foothold. According to one of the country's biggest developers, China's middle class perceive the interior styles and products of Ikea to be both fashionable and of top quality. Some indications do indeed suggest that trends in consumer tastes are turning in a direction favourable for the Nordic wood products industry. If Ikea-type products, and Western styles in general, are to be adopted as quality criteria in homes, this will focus considerable attention on the type of products and production that are suited to Nordic wood raw materials and expertise.

Chinese Market of Interest to Finland's Competitors Too

In the interviews with experts it was clear that the Chinese market is a promising potential export destination for the Finnish wood products industry. However, the prevalence of apartment blocks and the lack of familiarity with wood will not make it easy to achieve a significant increase in the use of wood as a building frame material. It may therefore be easier to find markets for wood products in interior fittings and other processed products than in bulk construction products. Any increase in the first of these will be more reliant on consumer opinion than in Europe, because in China it is the consumer and not the developer or designer (as in Finland, for example) who chooses the interior surface materials and fixtures in a new home.

Finland's competitors are, naturally, also interested in the Chinese market. The United States, for example, has long been an active investor in China's wood products market, and Russia has been supplying not only roundwood but also a growing volume of sawnwood. The competition will therefore be tough. In addition, there are other problems and risks in the Chinese market, such as the danger of illegal product copying, the bureaucratic processes involved and an unfamiliar business culture. Moreover, despite the strong growth trend, even China's GDP growth will probably experience occasional setbacks. A marked downswing could, for instance, reduce the amount of construction considerably and may even provoke social unrest. Companies striving to enter the Chinese market would do well to ensure that they have a sufficient buffer to withstand such eventualities.

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Greenhouse Gas Emissions Trading and the Finnish Forest Industry

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The Kyoto Protocol to the United Nations Framework Convention on Climate Change is due to enter into force in February 2005 now that it has been ratified by Russia, as this brings the number of ratifying countries to the required minimum of 55 and ensures that the required minimum of 55% of the 1990 greenhouse gas emissions of the industrialised countries is covered by the Protocol. The aim is to reduce the greenhouse gas emissions of industrialised countries. The European Union has already embarked on action to meet the obligations under the Protocol and has enacted the Emissions Trading Directive, which applies to the entire Union. From 2005 onwards, all industrial installations covered by the terms of the Directive must have a greenhouse gas emissions permit for fossil-fuel carbon dioxide emissions.

Finland's pulp and paper industry production installations fall within the sphere of the Emissions Trading Directive. However, the mechanical forest industry (sawnwood and other wood products) will not be affected directly by the emissions trading regulations, because its CO₂ emissions are quite low. In emissions trading, industrial installations will each be granted a certain amount of annual emission allowances for producing CO₂. The first round of allowances will be for the trial period 2005–2007. These will be issued free of charge and will be determined on the basis of 1998–2002 emissions. Some will be reserved for new production units entering service during the trial period. After this phase, the first Commitment Period under the Kyoto Protocol will begin, which will be 2008–2012. This will then be followed by five-year Commitment Periods, each requiring the renewal of greenhouse gas emissions permits.

The idea of the EU's emissions trading scheme

is to allow emissions to be reduced where this can be done at lowest cost. The greater the cost that an emissions producer would have to incur to reduce his emissions, the higher the price he will be willing to pay for purchasing emission allowances in emissions trading. The inclusion of the new EU member states will probably reduce the price of emission allowances, which will benefit Finland, too, because the costs of reducing emissions in Finland are high in many sectors. The so-called Linking Directive will also reduce the price of emission allowances by enabling credits earned by the developing and transition economies in emissions reduction projects to be linked in with the EU's emissions trading scheme.

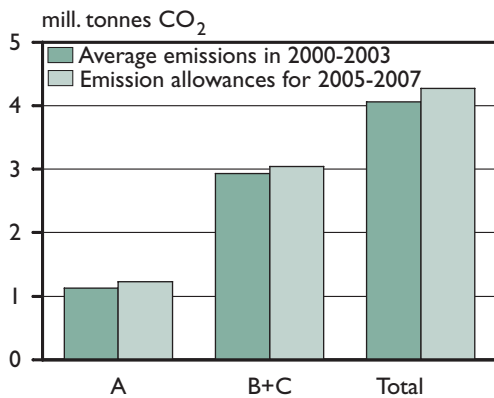
How Will Emissions Restrictions Affect the Finnish Forest Industry?

Carbon dioxide emissions originate mainly from energy production that uses fossil fuels (oil, natural gas, coal), peat or emission-neutral biofuels (e.g. wood). The energy-intensive paper industry is Finland's biggest electricity consumer and accounts for about 12% of the country's fossil-fuel CO₂ emissions. The pulp and paper industry's CO₂ emissions from the use of fossil fuels and peat amounted to approximately 5.3 mill. tonnes in 2003. This figure does not include emissions from purchased electricity, which the Finnish Forest Industries Federation estimates to be about 2.6 mill. tonnes.

Action to restrict CO₂ emissions will have both direct and indirect effects on the paper industry. In all, the indirect effects could be greater than the direct effects.

The direct cost to a company of reducing its

emissions is the investment needed to achieve this reduction, or, alternatively, the cost of purchasing the necessary emission allowances if the company were to exceed its own emissions quota. There is considerable uncertainty over the likely price of emission allowances, as this will depend on various demand and supply factors which are difficult to forecast: the initial allocation of emission allowances chosen by the countries participating in the emissions trading scheme; the need to restrict emissions and the costs of doing so; and future trends in energy needs and in the industrial sectors covered by the emissions trading scheme. So far, trading in emission allowances for the 2005–2007 trial period has been at less than EUR 9 per tonne of CO₂, but the absence of an active market at this early stage means that this is not a reliable indicator of the eventual price level. Estimates of the price of emission allowances for the trial period 2005–2007 are in the range EUR 7–15, and for the period 2008–2012, EUR 10–20. Honkatukia et al. estimate that if the market price of emission allowances remains below EUR 22 per tonne of CO₂, the pulp and paper industry would benefit from purchasing emission allowances instead of taking action to reduce its own emissions.



Source: Ministry of Trade and Industry

Pulp and paper industry average CO₂ emissions in 2000–2003 and annual emission allowances for the trial period 2005–2007, groups A, B and C. Excludes energy production emissions by pulp and paper mill plants set up as separate energy production companies.

Implementing emissions restrictions will also require active monitoring, reporting and planning of emissions, which will generate administrative costs. There will also be transaction costs in emissions trading.

The indirect effects will include a rise in the price of production inputs. In particular, the costs of electricity generation, and therefore electricity prices, will increase in the EU countries; as the biggest emissions producer, the energy sector will naturally be affected by the emissions restrictions. According to a study by the Technical Research Centre of Finland (VTT), an emission allowance price of EUR 10 per tonne of CO₂ would mean an increase of EUR 7.5/MWh in the price of market electricity on the Nordic electricity market. In the trial period, however, the rise in electricity prices is likely to be less than this, due to the free initial distribution of emission allowances and the fairly generous quotas. If the value of emission allowances for the electricity purchased externally by the forest industry were to be later transferred in full to the price of the purchased electricity, this would mean an increase of approximately EUR 26 mill. in the Finnish forest industry’s energy costs, calculated at an emission allowance price of EUR 10.

Higher energy prices and the costs of reducing emissions will also be reflected in the prices of energy-intensive production inputs, such as chemicals, fillers and coating materials. With the position of emission-neutral wood improving against other fuels, the forest industry could, in the longer run, find itself in competition with the energy sector for wood chips, which could lead to an increase in roundwood prices.

Trial Period Emissions Quotas Higher Than Earlier Emissions

For the Finnish paper industry, the emissions quotas presented for the trial period 2005–2007 are not very stringent. The diagram illustrates that the annual emission allowances for the pulp and paper sector exceed the sector’s average emissions for 2002–2003 both in terms of emissions inextricably bound up in the production process (group A) and emissions from the sector’s own energy production (groups B and C). In total, the emission allowances exceed the average emissions

of recent years by about 5%. These allowance figures, which are based on calculations by the Ministry of Trade and Industry, cover almost 80% of the pulp and paper sector's total CO₂ emissions (in 2003, these amounted to 4.1 mill. tonnes, according to the Ministry; the Finnish Forest Industries Federation puts the figure at 5.3 mill. tonnes). The other 20% is from the energy production by pulp and paper mill power plants set up as separate energy production companies; the emission allowances for these companies are included instead in the industrial energy production sector. In this sector, too, the emission allowances exceed the average emissions of recent years.

Even if the paper industry were to operate at full capacity in the trial period, the costs of purchasing the necessary emission allowances for this would not be very significant for the sector as a whole. However, these costs would not be evenly distributed, as some installations would have to purchase a considerable amount of emission allowances on the open market, while others would have allowances to sell.

Emissions Restrictions Will Have Only a Minor Impact on Forest Industry Profitability

Emissions restriction obligations are not likely to have a major impact on forest industry production during the emissions trading trial period. Even at their highest, the sum of the costs examined above will be clearly less than 1% of the value of Finnish pulp and paper industry exports, which totalled approximately EUR 9 billion in 2003. Compared with the effects of other

factors such as exchange-rate fluctuations or the fluctuations typical in pulp and paper prices, the impact of emissions reduction on forest industry profitability will not be significant in the next few years. Finland's obligation to reduce its emissions to the 1990 level will, however, create pressures to reduce emissions quotas after the trial period. The costs of reducing emissions are therefore likely to rise after the trial period, unless new mechanisms are added to the system to reduce emission allowance prices or emission restriction costs.

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Border Inspection of Roundwood Imports: Pathogens and Pests

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The volume of roundwood imported to Finland has roughly tripled since the start of the 1990s, reaching over 16 mill. m³ in 2003, and there is every likelihood that this growth will continue in the years to come. Far and away the most important source of Finnish imports is Russia: over 80% of all Finland's imported roundwood comes from Russia. In 2003, softwood accounted for about 7 mill. m³ of roundwood imports, and almost 90% of this was from Russia.

Besides roundwood, Finland also imports sawnwood, other wood products, wooden packaging materials, and seedlings and other supplies for artificial regeneration. From the plant protection viewpoint, seedlings are the most important of these imports. Imports of seedlings from low-cost EU member states, including the Baltic countries and Poland, are expected to increase considerably in the future.

New Border Controls

The European Commission's Standing Committee on Plant Health has decided that, as from 1 March 2005, softwood roundwood imported from any third country must be supplied with a phytosanitary certificate and must be inspected. Finland considered these directive amendments to be unnecessarily stringent for imports of roundwood from Russia's European regions, because the risk to plant health is assessed to be minimal and the required inspection of about 150 000 import consignments a year would slow down roundwood imports unreasonably. The Committee also approved a regulation by which member states can request a lower level of plant health inspection for certain imports. Finland did not approve this proposal either, as it stood. Instead, it requested – jointly with

Sweden – a reduced rate of inspection for softwood imported from Russia's European regions: instead of the 100% inspection of pine and spruce consignments, there would be a 1% or 5% inspection, depending on which particular part of Russia's European regions the consignment originates from. The Commission's experts have stated that a 1% inspection sample will be sufficient. The final decision will be taken by the Commission after it has heard the views of the Standing Committee on Plant Health.

Roundwood Origin Affects Forest Pest Risk

Plant inspection is designed to look for dangerous forest pathogens and pests that are on the quarantine organism list. In the case of forest trees, the main listed organisms are insects and fungi. Among the insects are the Siberian moth (*Dendrolimus sibiricus*) and certain bark beetle species (*Ips hauseri*, *I. subelongatus*, *Scolytus morawitsi*). Of particular significance is also the pine wood nematode (*Bursaphelenchus xylophilus*), which burrows into trees with the aid of sawyer beetles (*Monochamus* sp.); once inside, it multiplies and eventually kills the tree. The pine wood nematode was found in 1999 in Portugal, having probably come from the United States. Efforts have been made to isolate the infected area in Portugal, but the nematode has not been successfully eliminated.

In any assessment of the need for border inspection of imported roundwood, the decisive factor is the origin of the wood. Roundwood imported from the boreal forest zone in Russia's European regions should not present a major risk, because the insect and fungi species there are the same as in Finland. In addition, the species in Russia's European regions spread into

Europe long ago, with the building of the railways. By contrast, more distant imports of roundwood from Asia could present considerable risks. This is because of the known presence there of pathogens and pests that are dangerous to softwood. These include the pine wood nematode, several beetle species classified as serious potential pests (e.g. *Aelosthes sarta*, *Tetrobium gracilicorne* and *Xylotrechus altaicus*), bark beetle species (e.g. several *Ips* species) and species of blue stain fungi associated with them. It is also well known that East Asia has been the evolutionary centre of many forest pathogen fungal families. This is where both Dutch elm disease (*Ophiostoma novo-ulmi*) and chestnut blight (*Cryphonectria parasitica*) originated, which have destroyed trees all over the world.

East Asia also has many forest pathogens and pests that are unknown in Finland (and some even unknown to science), such as Armillaria root rot species (*Armillaria* sp.), *Inonotus* species, *Phellinus* species and endemic buttrot species (*Heterobasidion* sp.). The danger of these forest pathogens and pests to Finnish commercial forests cannot be evaluated because their behaviour in such an environment has not been studied. Consequently, these species are not given special attention in border inspections, which means that roundwood sales could result in such species being conveyed into Finland more easily than the actual quarantine species. If this were to happen, it can only be hoped that they would not cause significant destruction to Finnish tree species.

Seedling sales within Europe also present possible risks. An example of such is the recent discovery in Finland of the causative agent of Sudden Oak Death (*Phytophthora ramorum*). This disease was found in seedling consignments and has not spread to Finland's natural environment, but its appearance nevertheless demonstrates the need for constant vigilance. In the last ten years, Sudden Oak Death has spread in two different forms, one causing extensive destruction of oak woodlands in the United States and the other a less destructive form found in Europe. The situation is problematic in that, despite all efforts, the spread of the disease has not been contained, and new cases are constantly being found. For example, it has already

spread to the United States on at least two separate occasions.

Risk Assessment is Difficult

If unknown pathogens or pests spread to Finland, they could cause destruction in several ways. The most common risk is that a pathogen or insect that causes destruction elsewhere will also cause destruction in Finnish tree species. Hence we are aware of the dangers of, for instance, pine wood nematode and Dutch elm disease.

A lesser known risk is that a pathogen which is harmless or causes little damage elsewhere will cause considerable destruction to natural species in its new habitat (which are often related to a host plant growing in the country of origin of the pathogen or pest). A prime example of this is chestnut blight, which is practically harmless in East Asian chestnut species but has almost completely destroyed the American chestnut.

Yet more unpredictable is the risk presented by microscopic fungi and insects that cross with an existing species in their new habitat to form a hybrid species. Such a case is the hybrid *Phytophthora* found in Central Europe, which, although neither of its parent species appears in alder, has destroyed riverside alders at an accelerating rate in the past twenty years, adding to erosion problems too.

A fourth factor concerning plant pathogens and pests is the introduction of new plant species. If, for instance, plant species not endemic to Finland but found elsewhere in Eurasia were to be grown as decorative plants, pathogens could be transferred over large distances. This is what happened in the early twentieth century, when white pine blister rust (*Cronartium ribicola*) was transferred from Asia to Europe via the cembra pine plantings at Siberian railway stations. A similar explanation may also lie behind the arrival in Finland of a new alder rust (*Melampsorium hiratsukanum*) that uses larch as an intermediate host. The introduction of new plant species can also fail because of a forest pathogen or pest that accompanies it, such as the case in Iceland, where flea beetles that arrived

with seedling consignments destroyed the pine and sitka spruce plantings.

Border Control Efforts Should be Directed to Where the Risk is Greatest

To conclude, border control of roundwood imports must pay particular attention to consignments whose risk is known to be high or is unknown. Close attention to point-of-origin information is therefore essential. The situation would be untenable if, for instance, roundwood from Russia's European regions were also to include roundwood from further east. Roundwood importers thus have a key role to play in ensuring the accuracy of the point-of-origin information for roundwood consignments.

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