



Finnish Forest Sector Economic Outlook 2009–2010

Editors

Riitta Hänninen
Yrjö Sevola

Translation

Bellcrest Translations Ltd./Peter Ovell

Technical editing

Sari Elomaa

Database

Jarmo Mikkola

This Economic Outlook is a translation of an abbreviated version of the Finnish original and is based on information available in early October. It is published in PDF format annually in late November.

Available at

[www.metla.fi/julkaisut/
suhdannekatsaus/index-en.htm](http://www.metla.fi/julkaisut/suhdannekatsaus/index-en.htm)

ISBN 978-951-40-2208-1 (PDF)
ISSN-L 1798-3037
ISSN 1798-3037

November 2009

Finnish Forest Research Institute
Vantaa Research Unit

Contributors

Jukka Aarnio, M.Sc.(For.), M.Soc.Sc., researcher

Perttu Anttila, D.Sc.(For.), researcher

Antti Asikainen, D.Sc.(For.), professor

Riitta Hänninen, D.Sc.(For.), researcher

Jussi Leppänen, M.Sc.(For.), researcher

Katja Lähtinen, D.Sc.(For.), researcher

Antti Mutanen, M.Sc.(For.), researcher

Tarmo Rätty, D.Soc.Sc., researcher

Yrjö Sevola, Lic.Sc.(For.), senior researcher

Esa Uotila, M.Sc.(For.), researcher

Kari Valtonen, M.Sc.(For.), researcher

Jari Viitanen, D.Soc.Sc., researcher

email: firstname.lastname@metla.fi

Contents

Summary	<i>Riitta Hänninen and Jari Viitanen</i>	4
I World Economy	<i>Jari Viitanen</i>	9
2 The Finnish Forest Industry		14
2.1 Production and Exports in the Sawmilling and Plywood Industries		
<i>Riitta Hänninen and Antti Mutanen</i>		14
2.2 Production and Exports in the Pulp and Paper Industry	<i>Kari Valtonen</i>	19
2.3 Costs and Profitability in the Finnish Forest Industry	<i>Katja Lähtinen</i>	24
3 Forestry in Finland		27
3.1 Utilisation of Wood Resources	<i>Yrjö Sevola</i>	27
3.2 Roundwood Markets	<i>Jussi Leppänen and Esa Uotila</i>	29
3.3 Investment and Profitability in Non-Industrial Private Forestry		
<i>Jukka Aarnio and Esa Uotila</i>		32
Featured Topics		35
Forests, Wood Products and Climate Policy	<i>Tarmo Räty</i>	35
Will the Growth in Forest Energy Use Continue?	<i>Antti Asikainen and Perttu Anttila</i>	38



Summary

The economies of the Finnish forest sector's export markets in Europe began to turn onto a more favourable track in early autumn 2009. The production cuts made in the paper and sawmilling industries brought an end to the decline in prices, and the price of sawnwood, which collapsed in 2008, has picked up since summer 2009. Demand growth in the markets has been slow, however, due principally to the replenishment of stocks. With domestic consumption and exports remaining weak, production in the sawmilling industry for the full year 2009 will be down by about one fifth on the 2008 figures. In paper production and exports, the drop has been even greater, as demand on the export markets has fallen and Finnish-based production units have been closed. On the roundwood market, the forest industry's reduced roundwood need has led to a fall in roundwood sales, commercial fellings, stumpage prices and stumpage earnings. On the positive side, there has been a growth in the energy use of wood, which is expected to have increased the use of wood chips by about one tenth for 2009 as a whole compared with 2008. Roundwood imports are down in 2009 to about half of the previous year's level.

In 2010, GDP growth will remain slow and is expected to boost the demand for forest industry products by only a small amount. Despite production cuts, the European paper market will still be experiencing overcapacity, and no increase is expected in the average export prices of Finnish paper in 2010. Production and exports will grow as a result of the slightly improved demand, and profitability will improve following the business efficiency measures undertaken. In the sawmilling industry profitability will be improved by the strengthening export prices and growth in production. Despite the

production growth, sawnwood production will remain close to the level of the early 1990s. As the forest industry's need for wood rises, demand will focus more strongly on domestic roundwood, even if Russia abandons the planned increases in its export duties on roundwood. The increase in sawnwood production will push up the price of softwood sawlogs, but with pulpwood stocks remaining high, their prices will remain close to the 2009 level. The sales revenue tax relief on roundwood in force in 2009–2010 is expected to boost roundwood sales. Commercial fellings will be up in 2010, but the volume will be significantly below that prevailing before the current recession.

Although the economic outlook is improving, the situation is not about to return quickly to the pre-recession level, and there is a real risk that the projections will be worse than anticipated. The impact of the Government's policy measures for stimulating an economic recovery could weaken and a continued increase in unemployment could result in a steep drop in consumer confidence. On the other hand, it is also possible that confidence in future growth could rise and the recovery could accelerate earlier than forecast here.

Slow Recovery from Recession in Export Markets

Real GDP growth in the world economy weighted according to the distribution of Finnish forest industry exports will be down by more than 3% for the full year 2009. Since summer 2009, a

return to a slow growth track has been evident in the most important markets for the Finnish forest industry, following the global economic recession that began in autumn 2008. Following the sharp fall in the early part of the year, the euro area economies' GDP will show a contraction of over 4% for 2009 as a whole, although during the final months of the year the area's economies are expected to recover slightly and demand to improve. The shrinkage in the German economy will be 5.5%, and in the UK economy 4%. Although the weak krona has allowed Sweden to expand its market share, for instance in the sawnwood market, even Sweden's GDP will be down for the full year 2009, by 5%. In 2010, the slow economic recovery will continue, mainly on account of the growth in trade and exports in the world economy. The euro area economy is forecast to grow by only about 0.5%.

China's GDP growth is expected to be up in 2009 by over 8%, and in 2010 by almost 10%. The Japanese economy will start to grow in 2010, by about 1.5% as against a contraction of almost 6% in 2009. Although in the United States the economic recovery began during the summer, the US economy will have shrunk by about 2.5% in 2009. In 2010, the US economy is forecast to grow by 1.5%. On the sawnwood market, the economies of the Middle East and North Africa will, on average, grow at a faster rate than the rest of the world. Finland's export-driven economy will recover more slowly than the rest of the world. Finnish GDP for the full year 2009 will be down by 7%. With world market demand and exports growing in 2010, the Finnish economy is forecast to grow by about 2%.

Slight Recovery on Sawnwood Market in Late 2009

The economic crisis and the slowdown in construction have reduced sawnwood demand both in Finland and on the main export markets, and the limits imposed on sawnwood production have continued across Europe. In the first half of 2009, Finnish exports were down to all the traditional exports markets, with the exception of North Africa. Among Finland's competitors, Sweden has, by contrast, increased its exports,

aided by the weak krona. As Finland's exports and domestic demand have fallen, Finnish sawnwood production for the full year 2009 is expected to be down by one fifth from the 2008 level, falling to its lowest level since the 1990s recession. The major Finnish forest industry companies in particular have reduced their sawnwood production. Since spring 2009, sawnwood prices have started to rise as stocks have fallen, signalling a turn for the better. The recovery in construction in 2010 will be slow, however, on both the domestic and export markets. This is why the rise in prices in Europe will also be slow, with the average price of Finnish exports increasing by about 6% on the average for 2009. Sawnwood production is forecast to rise to 8.2 mill. m³ in 2010. In comparison with the figures for the start of this decade, production quantities have nevertheless slumped by about 40%.

On the plywood market the contraction in demand began later than on the sawnwood market. The drop in export prices has also been less marked than on the sawnwood market. The production and export volumes of Finnish plywood for 2009 as a whole have nevertheless collapsed to half of their levels of a year earlier. The drop in birch plywood production has been particularly sharp. The slump in birch sawlog imports and the decrease in domestic fellings have led to a raw material shortage at the production plants. In 2010, plywood production is expected to pick up, but the recovery will be slow, as in sawnwood production. The average export price of plywood is forecast to rise by about 6%.

Demand for Paper Starting to Rise Slowly

The recession has reduced the demand for paper and paperboard on the world market. Demand growth has also slowed in China. In Europe, the demand for printing and writing papers was already declining at the start of 2009, as advertising work switched to electronic media. A less marked drop occurred in the demand for paper and paperboard used in consumer packaging. The consumption of tissue and hygiene papers has been least affected by the recession. Printing paper capacity cuts and production

limits in 2009 have continued in Finland and elsewhere in Europe. Production and exports of Finnish paper are expected to be down by almost one quarter on the 2008 levels. Despite the production cuts, there is still oversupply on the European printing paper market, and the export price of paper is declining again, having begun to rise a little in the early part of 2009. The average export price of paper is nevertheless expected to be up by about 2% for the full year compared with the 2008 average. On the world pulp market, the production cuts in softwood pulp have been greater than those for hardwood pulp, and market prices for softwood pulp have risen during 2009, in contrast to those for hardwood pulp. The average price of pulp exports for 2009 as a whole is nevertheless expected to be down by about one fifth on the 2008 figure.

Paper demand in Europe in 2010 is forecast to grow a little and to push up pulp demand as national economies slowly recover. Signs of positive trends are already visible, as the drop in demand for printing and writing papers in Europe has tailed off and consumption has begun to rise gently since the summer. Production and exports of Finnish paper and paperboard in 2010 are forecast to grow by about 5%. With only a slow growth in paper demand, however, the capacity cuts undertaken in Finland and elsewhere in Europe will not be sufficient to push paper prices up significantly. Instead, the average export price of Finnish paper is expected to remain at approximately the 2009 level. On the pulp market, the growth in Asian demand will boost the market price in 2010, pushing up the forecast average export price of Finnish pulp by about 10% on the 2009 average.

Improvement in Forest Industry Profitability in 2010

The profitability of the wood products industry plummeted to an unprecedentedly low level in 2008 as a result of the drop in demand for wood products, the oversupply on the European market and the decline in export prices. The industry's profitability has remained weak since the start of 2009, and a turnaround is not anticipated until 2010, when the level prevailing at the mid-point

of the present decade is likely to be achieved. As with the wood products industry, a marked deterioration in the pulp and paper industry's profitability began in 2008 and has continued in 2009. During 2009, the price trend in pulp and paper products has improved marginally, but any improvement in the sector's profitability will not be seen until 2010, despite the business efficiency improvements undertaken and the favourable developments in overall costs.

Focus of Forest Industry's Demand for Wood Increasingly on Finnish Roundwood Resources

The Finnish forest industry's imports of roundwood for the full year 2009 are likely to be just half of the previous year's figure, dropping to below 10 mill. m³. Although commercial fellings are also down, to about 40 mill. m³, there is sufficient roundwood for the pulp industry. Production is at a low level, and stocks of harvested roundwood have remained high.

Due to the weak demand for sawnwood, softwood sawlog stumpage prices continued to fall in the first half of 2009. However, sawnwood production recovered perceptibly during the summer as stocks were reduced, and this served to boost softwood sawlog demand. Although the drop in stumpage prices is expected to have ceased, these prices for the full year 2009 are expected to be 23% below the 2008 average. The remainder of 2009 will see further downward pressure on all pulpwood stumpage prices as a result of the large stocks of pulpwood and the paper and pulp production cuts. The supply of roundwood is nevertheless expected to improve in the second half of 2009 on account of the 50% roundwood sales revenue tax relief. In contrast to other roundwood categories, the demand for forest energy has been good in 2009, and the use of wood chips for thermal and other power plant use is forecast to be up for the year, to 4.5 mill. m³.

In 2010, the slight growth in forest industry production will increase domestic commercial fellings by 15% on their 2009 level, as no major change is expected in the volume of roundwood imports. Nominal stumpage prices of softwood sawlogs will rise by 4–8% as a result of the

growth in sawnwood production. The stumpage price of birch sawlogs is forecast to rise due to the almost total cessation of birch sawlog imports. Pulpwood stumpage prices will remain close to their 2009 levels, when the reduced volumes of imported roundwood and domestic sawmill chips are replaced in the paper industry with domestic pulpwood from thinnings. The demand for forest energy will continue to be good, and thermal and other power plant use is forecast to grow to 5.5 mill. m³.

Forestry Operating Profit Sinks Significantly Below Long-Term Average

As a consequence of the deep recession in the Finnish forest sector, the operating profit from non-industrial private forestry for 2009 as a whole will sink to a level of EUR 42–46/ha. This downward slide will be stopped in 2010, when commercial fellings will increase and sawlog prices will strengthen a little. The operating profit will nevertheless be significantly below the long-term average. In real terms, such a low point was last reached in the recession years 1992 and 1993. In 2010, earnings will rise by about EUR 10/ha, but will still be about 40% below the average for 2004–2008. As a consequence of the recession, 2009 stumpage earnings from forests in non-industrial private ownership will be about EUR 850 million, or almost half of the previous year's level. With roundwood sales and commercial fellings picking up in 2010, stumpage earnings are forecast to be up by 10–15% on the 2009 figure.

Assumptions and Uncertainties in Forecasting

The aim of this Economic Outlook is to provide information on the current state of the entire Finnish forest sector and the outlook for the sector in the near future. The forest sector forecasts are based on publicly available statistics, world economic forecasts, market information and other forest sector data from different sources, and research conducted by the Finnish Forest Research Institute. The forecasts presented here are based on the principle of derived

demand, according to which fluctuations in GDP growth on the domestic and export markets will, via demand, be reflected in forest industry production and thus the domestic roundwood market. Changes in the forest sector's operating environment and the effects of the Government's economic policy measures are taken into account in making the forecasts. If GDP growth turns out to be below the level forecast, this would mean that export prices, production and profitability for the Finnish forest industry will be lower than indicated in the forecasts given here. 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.

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 based mainly on forest sector information available in late September and early October 2009 and world economic forecasts for 2009 and 2010. 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.

The greatest uncertainty in the forecasts is that unexpected changes in GDP growth may occur in export markets. At the time of writing, in autumn 2009, there are many uncertainties and risks associated with the forecasts for the economy.

Is the Recession Over Already?

The latest statistical data on a range of economies for the second quarter of 2009 indicates that the contraction in GDP growth has been halted. Since the summer, output in a number of economies – among them the United States,

Japan, Germany and France – has even been growing slightly, and exports have begun to pick up. In their forecasts, economists are particularly united in the view that the recession is over and that growth has begun in autumn 2009. Growth is nevertheless expected to be slow. But is the recession really behind us, and what kind of risk factors are concealed behind the forecasts?

There are primarily two key factors behind the end of the recession. First, since the start of the global recession a number of Governments have introduced substantial recovery packages, focusing on boosting public expenditure. In addition, central banks dropped their central rates and in part also pumped money into the economy by purchasing government bonds and providing direct support for banks that were in difficulty. Such action has gradually started to bear fruit, and confidence in the financial markets has improved. Stocks have also been run down during spring and summer 2009, and production has grown. This has been visible as an increase in world trade and exports.

However, running counter to these recovery signs has been the fear that these signs will be short-lived. Once stocks have been replenished, will production needs fall again to the pre-recession level? There is also a fear of higher taxation, which will be unavoidable when the loans taken to fund the recovery packages have to be repaid. In some countries, there have already been calls for the recovery to refocus on savings. The timing of a turnaround in financial policy will indeed become a key factor in successfully managing the economic turnaround. Tightening public expenditure and taxation too early could push the world economy back into recession. The central banks face a similar problem: when is the moment right to begin raising interest rates in order to manage the upswing?

Key forecasting variables, 2008–2010.

Forecasting variables	2008	2009	2010
	% change from previous year		
Sawnwood production	-21	-20	5
Sawnwood export	-15	-15	6
Sawnwood export price	-16	-12	6
Paper production	-9	-23	5
Paper export	-12	-24	5
Paper export price	2	2	0
Commercial fellings	-11	-23	15
Roundwood imports	11	-53	1
Sawlog prices			
Pine	-12	-23	4
Spruce	-14	-23	8
Birch	4	-26	4
Pulpwood prices			
Pine	5	-23	1
Spruce	-5	-26	2
Birch	4	-22	-2

Price changes are nominal

A major share of national GDP is made up of private consumption, which is affected not only by the level of disposable income but also to a considerable extent by the expectations of future growth. During the summer and early autumn, the consumer confidence indicators have begun to climb from their rock bottom levels as the housing market slump eased off a little. However, with an increase in unemployment, confidence rests on a knife edge, and even the faintest bad news could adversely affect households' willingness to consume. It is also unclear whether or not the balance sheets of the banks are in good shape. The recession can finally be declared over only after the coming winter has passed, by which time it should be known whether industrial production has continued to rise and whether consumption and investment in Europe are recovering to close to the pre-recession level.



I World Economy

The global economic recession that began in autumn 2008 started to turn the corner during spring and summer 2009, as a result of the substantial recovery packages of fiscal and monetary policies pursued around the world. However, with unemployment continuing to grow, the recovery will be slow. Real GDP growth in the world economy weighted according to the distribution of Finnish forest industry exports will be negative for 2009 – a contraction of more than 3% – though in 2010 this will be turned into a growth of 1.5%. The economy of the euro area – the Finnish forest industry’s most important market – will have shrunk by more than 4% in 2009, despite a minor recovery and improved demand in the euro area economies in the remainder of the year. The shrinkage in the German economy will be 5.5%, and in the UK economy 4%. Although the cheap krona is helping Sweden compensate for the weak demand on the world market, even Sweden’s GDP growth will be down in 2009, by 5%. The recovery in the euro area economies will continue to be slow in 2010, with real growth forecast to be 0.5%.

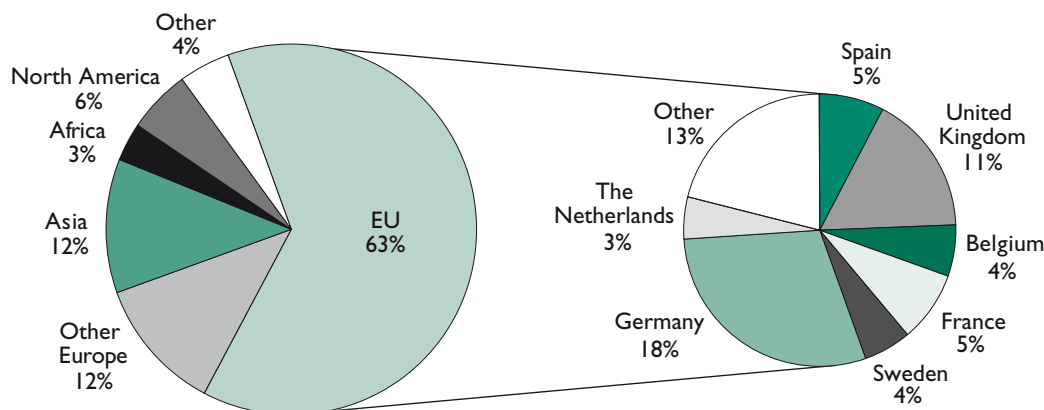
China has briefly been driving the world economy, and its GDP growth is expected to be over 8% for 2009, rising to almost 10% in 2010. After shrinking by nearly 6% in 2009, the Japanese economy will return to a slow growth track in 2010. The recession in the US economy in 2009 is expected to turn into a growth of close to 2% in 2010. Although the global recession is drawing to an end, growth is still threatened by uncertainty over the restoration of consumer confidence and the need to stimulate investment as unemployment continues to grow.

Forest Industry Exports Fell in 2008

In 2008, the weakening of overall demand worldwide and the reductions in Finnish production capacity led to an 11% drop in the value of Finnish forest industry exports in comparison with the previous year’s figure. The export volume of sawnwood fell by 15%, plywood by 13% and paper by 12%. The geographical distribution of exports remained almost unchanged, with the exception of sawnwood. Owing to the slump in euro area construction in 2008, sawnwood’s share of total exports was 5 percentage points down on the previous year’s figure. By contrast, Africa’s share of these sawnwood exports was up by a similar proportion. In terms of export value, the European Union – and especially the United Kingdom, Germany and France – is still the most important export market for the Finnish forest industry.

The total value of forest industry exports in 2009 is expected to be down by about one quarter on the previous year’s figure. The value of sawnwood exports will be down by almost one third, and paper by about one quarter. In 2010, the combined export value of forest industry products is forecast to grow by about 10% year on year. In the paper industry, the growth in export value will be mainly due to higher export volumes, while in the wood products industry prices are also expected to rise a little.

The economic trends in the main export markets for the Finnish forest industry examined in this chapter play a key role in the forecasts of demand, prices and export levels for Finnish forest industry products. Along with regional and national GDP forecasts, forecasts of investment and especially construction can be used in forecasting future export levels in the wood products



Sources: National Board of Customs and Finnish Forest Research Institute.

Finnish forest industry exports by value, 2008.

industry. Based on forecasts of private consumption growth, forecasts can be made of, for example, the demand for packaging materials, paperboard and paper. The economic situation in Finland's key competitor countries affects the level of competition and prices on the market, via exchange rate fluctuations and the supply of forest industry products.

Export Growth Slow to Revive the Euro Area

The contraction in the euro area economy began in the latter part of 2008 and continued in the early part of 2009, though figures for the second quarter already indicated that a turnaround may have occurred: the second-quarter GDP for the entire euro area shrank by only 0.1% on the first quarter figure, while German and French GDP actually grew by 0.3%. As world trade picks up, the euro area recovery is being driven by export growth in particular. During the latter part of 2009 world trade and euro area exports are expected to improve further, which is also supported by the higher figures in the Euro Area Purchasing Managers' Index.

The increase in general uncertainty and the weakening employment situation in the first half of the year led to a higher level of precautionary saving by households and a drop in private consumption. The average indebtedness of euro area households is nevertheless quite low, and it is expected that a general recovery will also mean that private consumption gradually picks up. There are already signs of this in Germany,

for instance. Low interest rates and improved confidence on the financial markets are also encouraging consumption. However, the pace of consumption growth will be kept in check by the increasing level of unemployment and the slower growth in real earnings. Production cuts and a low capacity utilisation rate have led to an almost total collapse in investment in the euro area. In particular, new housing and commercial property starts have been on hold. No rapid increase in investment is expected towards the end of 2009 either, as production increases will occur mainly by raising the utilisation rate of existing capacity. Euro area GDP for the full year 2009 will be down by more than 4%.

The euro area economic outlook for 2010 is brighter, as the growth in world trade will further boost euro area exports. Private consumption is forecast to rise only slightly. The growth in consumption will be kept in check by higher unemployment and a slower growth in real earnings in the euro area. By contrast, investment is expected to shrink further, as production growth will occur through raising the utilisation rate for existing capacity and premises. In most euro area countries there will be no new housing construction before housing prices have at least stabilised and confidence in the economy restored, following the slump in house prices brought on by the recession. The euro area's GDP in 2010, driven by exports, is forecast to be up by only about 0.5%.

As the world economy slowly recovers, the increased demand for raw materials and energy will gradually push up inflation, which has sunk

to almost a zero rate. Cost pressures will remain low, and the slow pick-up in GDP growth is likely to mean that the European Central Bank will keep its central rate unchanged until at least the second half of 2010. With growth in the US economy in 2010 expected to be above that of the euro area, this may slightly weaken the euro against the dollar in the latter part of the year.

Differences in Recovery Rate Elsewhere in Europe

In the United Kingdom, GDP growth was halted more rapidly than in the euro area because of the combined effect of the collapse of the UK housing market price bubble and the global financial crisis. The credit squeeze and plunging property values already visible in the second half of 2008 prompted indebted households to divert their available income from consumption to saving. UK investment for 2009 as a whole is expected to be down substantially on account of the tougher conditions for obtaining credit, the contraction in exports and the weak demand for end products. Another contributing factor is the collapse in new housing starts. The figures for the second half of the year will show a slight increase in UK exports and production, due to the recovering world economy. Nevertheless, the UK's 2009 GDP will be 4% down on the

previous year's figure, though in 2010, GDP will grow by about 1%, driven by export growth. Private consumption will remain at almost the 2009 level, and the drop in investment will no longer be worsening. If the UK economy grows faster than that of the euro area in the second half of 2010, the pound will probably strengthen against the euro.

Although even the Swedish economy has not managed to bypass the global recession, its prospects for returning to a stable growth track appear better than many other countries. Weak demand for end products on Sweden's export markets has been compensated by the weakening of the krona, which has brought a competitive advantage that has allowed Swedish sawmills, for instance, to expand their market share. Sweden's GDP for the full year 2009 will be down by almost 5%. In 2010, exports and private consumption are forecast to grow, but, countering this, investment is expected to shrink further. Provided the economy picks up in the first half of the year, Sweden's central bank, the Riksbank, could well raise interest rates after the summer, which would strengthen the krona. The International Monetary Fund (IMF) forecasts that Sweden's GDP will grow by 1.2% in 2010.

The Baltic countries' brisk GDP growth in most of the current decade was based largely on borrowing. However, these countries have

Growth forecasts for world economy (real GDP, annual percentage change).

Area	Proportion of Finnish forest industry's total export value 2008, %	Actual GDP growth % 2008	ETLA 2009	IMF 2009	ETLA 2010	IMF 2010
Weighted by proportion of Finnish forest industry exports	100.0	1.7	-3.8	-3.1	1.5	1.5
EU-27	63.5	0.9	-4.5	-4.2	0.5	0.5
Euro countries	41.8	0.4	-4.5	-4.2	0.5	0.3
Germany	18.8	1.0	-5.5	-5.3	1.0	0.3
United Kingdom	10.5	0.8	-4.0	-4.4	1.0	0.9
Sweden	3.6	-0.6	-5.0	-4.8	0.0	1.2
Russia	5.7	5.6	-8.0	-7.5	3.0	1.5
United States	5.4	1.2	-2.5	-2.7	1.5	1.5
Asia	11.5	5.6	2.0	5.0	6.5	6.8
Japan	3.2	-0.7	-6.0	-5.4	1.5	1.7
China	2.1	9.0	8.0	8.5	9.0	9.0
Other	13.9					

*Forecast by Research Institute of the Finnish Economy (ETLA) published September 23, 2009.
Forecast by International Monetary Fund (IMF) published October 1, 2009.*

seen their GDPs fall dramatically as a result of the problems of the banking sector, the rise in the rate of saving and the collapse in exports. The 2009 GDP figures for Estonia, Latvia and Lithuania will all show a shrinkage of more than 15%. Although consumer and business confidence is no longer at rock bottom, the recovery in national economies and a return to healthy growth will not happen overnight. Forecasts for the Baltic countries' economies in 2010 show a further shrinkage in GDP, by some per cent .

Improvement in Sight for Russia

The Russian economy is expected to have contracted by as much as 8% in 2009. The principal reasons for this rapid reversal have been the slowing of production and exports and the heavy reliance of exports on the world market demand for energy and especially oil products. Even though almost half of the government's stability fund built from export revenues has been used up and spending has been targeted at public consumption, these measures have not compensated for the deterioration in the rest of the economy. Despite the strengthening of the ruble and the lower prices of foreign consumer products, Russia's private consumption has fallen. Consumption has also been affected by the sharp rise in unemployment, the difficulties in obtaining credit, the high inflation rate and the drop in real earnings growth. Neither has Russia been able to attract sufficient foreign investment, due to the unclear and unpredictable nature of its economic policies.

With a recovery in international trade and a growth in the demand for raw material, Russia's exports have gradually started to increase, however. A contributory factor here is also the expected weakening of the ruble in the short term. In the longer term, however, the ruble will probably strengthen as a result of growth in export revenues and GDP. There will be no quick return to the high growth figures of recent years, at least in the short term, but instead a very modest level of growth in all sectors of the economy. Russia's GDP in 2010 is forecast to grow by 2–3%.

US Economy Already Over the Worst

Although the downward slide in the United States economy was still abundantly evident at the start of 2009, the statistics show that the economy turned the corner during the summer, and the country's GDP for the second half-year is expected to show growth of even 3–4%. The reasons for this growth are the government's substantial fiscal policy recovery package, which is starting to produce results in the autumn in the form of depleting stocks and a fractional pick-up in the housing market. The stabilisation of the housing market will be a key factor in getting private consumption moving. Investment will be down by almost one fifth for 2009 as a whole, on account of the weak state of overall demand and the extent of unsold housing properties. Although the dollar has remained weak and thus aided the country's export industry, exports have contracted during 2009 due to the weak demand on the world market. The United States' GDP figure for 2009 will show a shrinkage estimated at 2.5%.

In 2010, the recovering world economy is expected to push up US exports, aided by a still weak dollar. The dollar may well strengthen a little during the year if the economy starts to grow faster than that of other western countries. The recovery in the housing market will also lead to a gradual return of new housing construction, but investment in other sectors will probably be only modest. The growth expectations for private consumption are uncertain, however. The still deteriorating employment situation, the low growth in real earnings and the repayment of existing debts do little to encourage consumption. On the other hand, there are already signs in autumn 2009 that consumer confidence is improving and that private consumption is growing by a small margin. The recovering financial sector and the still low interest rates will also improve the prospects for obtaining credit in 2010. US GDP in 2010 is forecast to grow by 1.5%.

Canada's GDP for 2009 is expected to show a shrinkage of 2.3%. The reasons are the same as those affecting other industrialised countries. The growth in public consumption has not been sufficient to compensate for the collapse in exports and investment. Although the Canadian

dollar is expected to strengthen a little against the US dollar in 2010, exports will be up slightly as a result of higher demand on the world market. This together with a moderate growth in private consumption will contribute to a GDP growth of 2.5% for Canada in 2010.

Did China Even Have a Recession?

China is still only a relatively small market for the Finnish forest industry. Nevertheless, it occupies a prominent and growing position in the world market for forest products. Despite its economy being export-driven, China has sustained only limited damage in the global recession. China will post a growth of over 8% in its GDP for 2009, although exports will be down as a result of the dramatic fall in demand on the world market. With rapid changes in its economic policies China has managed to bring its domestic demand and investment onto a growth track. Private consumption will account for only about a third of China's GDP, but this proportion is growing quickly. In 2010, China's domestic demand will remain strong, although monetary policy is expected to be tightened in order to avoid overheating. In addition, the recovery in international demand will produce further growth in exports and thus bring the country's GDP back to possibly even double-digit growth.

Japan's export industry has suffered considerably from the collapse in demand on world markets. Despite the slight recovery in production and exports in the second quarter of 2009, Japan's exports over the year as a whole are expected to be down by more than one quarter on the previous year's figure. Growth in public consumption and the recovery packages have not managed to compensate for the drop in private consumption and investment. Although the outlook for the Japanese economy in the latter part of 2009 is brighter, the country's GDP for 2009 will have shrunk by almost 6%. Despite almost zero interest rates, Japan's economy has long been troubled by deflation, which does little to encourage investment or consumption. Production is expected to grow in 2010 through an increase in capacity utilisation rates, and so the level of investment will decline further. Private consumption will remain at almost the 2009 level. Japan's GDP in 2010 is forecast to grow by about 1.5%, almost entirely as a result of export growth.

Although the global economic recession has also slowed growth in the Middle East and in the North African states that import Finnish sawnwood, these economies will once again post positive GDP growth, averaging around 2% for 2009. In 2010, the recovery in the world economy and the growth in demand for oil products will accelerate economic growth in these regions to an average of over 4%.



2 The Finnish Forest Industry

2.1 Production and Exports in the Sawmilling and Plywood Industries

Sawnwood demand both in Finland and on the main export markets has fallen during 2009 as a result of the economic crisis and the slowdown in construction. Production limits for sawnwood continue to be in place all over Europe. In Finland, production is expected to be down by one fifth on the 2008 figure, to its lowest level since the 1990s recession. A turnaround is nevertheless expected during 2009, and there were signs of this after the spring, when sawnwood export prices began to rise once again. The growth in construction in 2010 will be slow, however, on both the domestic and export markets. Price rises in Europe will also continue to be slow, and the average export price of sawnwood is expected to rise by about 6% in comparison with that for 2009. Sawnwood production is forecast to rise to 8.2 mill. m³. This would represent a drop of some 40% from the production levels at the start of the decade.

On the plywood market, the turnaround in demand occurred later than on the sawnwood market. The fall in export prices has also been less pronounced than for sawnwood. The production and export volumes of Finnish plywood for 2009 as a whole have nevertheless collapsed to half of their levels of a year earlier. The contraction in production concerns especially birch plywood, a key raw material for which are birch sawlogs imported from Russia. The slump in birch sawlog imports and the decrease in domestic fellings have led to a shortage of this raw material at the production plants. In 2010, plywood production is expected to pick up, but the recovery in sawnwood production will be

slow. The average price of plywood exports is forecast to rise by about 6%.

Slow Growth in the Economy Keeps Demand for Wood Products Low

The consumption and prices of wood products fell considerably around the world as a result of the global economic crisis that began in 2008 and the consequent slow down in construction. In North America and Europe, in particular, the fall in demand exacerbated the sawnwood oversupply situation in the first half of 2009. This redirected a lot of trade away from Europe to other markets, such as North Africa.

Forecasts show that the value of new housing construction in Western Europe in 2009 as a whole will average about one fifth less than in 2008. The economic recovery packages are nevertheless expected to boost construction in the latter part of 2009 and in 2010. Forecasts for 2010 indicate that the growth in construction will be slow, however. The total value of new housing construction in Western Europe in 2010 is forecast to be slightly below the 2009 level. There will, however, be differences in the construction trend from one country to another: in France, Germany and the United Kingdom, construction value in 2010 is forecast to rise above the previous year's level, whereas in Finland, for example, it is likely to be almost 10% below the 2009 figure.

In the United States, housing starts in 2009 will be down on the previous year by about one quarter. Housing starts in 2010 will be

significantly below the long-term average, although growth is expected to have begun. In Russia, the construction boom of recent years has faded and the total amount of housing construction has fallen. By contrast, the figures show that timber-framed house construction has increased again, although the pace of growth has slowed. In Japan, housing starts in January–May 2009 were down by one fifth year on year. However, the Japanese economy turned onto a growth track in summer 2009, and the rise in GDP is forecast to accelerate in 2010, probably increasing the volume of construction. In China, a factor more important than construction in affecting sawnwood and plywood demand is the added-value processing for the export market, which is in turn dependent on the economic situation in the United States and Europe.

Since the anticipated recovery in construction will be slow, the growth in sawnwood demand in Europe is likely to be low in 2010. The market will pick up slowly in the United States and Japan as well. North Africa and the Middle East have not experienced the same kind of drop in sawnwood demand as that seen in the rest of the world. The growth in sawnwood imports to these regions from Europe and Russia is nevertheless a sign that the oversupply situation is worsening.

Improved Economic Situation in Late 2009

Overall exports of Finnish sawnwood fell in January–June 2009 by about one fifth, year on year. Sawnwood exports to European markets were down by an average of 34%, with exports to the UK, for instance, falling by more than 40%. Exports to Asia and especially Japan were also down, but exports to the North Africa market grew slightly. The change in the pattern of Finnish sawnwood exports has been dramatic: in the first half of 2009, exports to markets outside Europe were greater than those to Europe, and Egypt became the biggest export destination for Finnish sawnwood.

In January–June 2009, Finnish sawnwood production fell by more than exports, by around one quarter on the previous year's figure. The drop in production was attributable not only to

*The Finnish sawmilling and plywood industries, 2008
1000 m³.*

	Sawnwood	%	Plywood	%
Production	9 800	100	1 265	100
*Domestic use	3 820	39	182	14
Exports:	5 980	61	1 083	86
EU	3 089	32	918	73
Africa	1 515	15	2	0
Asia excl. Japan	475	5	66	5
Japan	777	8	10	1
North America	3	0	24	2
Russia	8	0	4	0
Other	113	1	59	5

**Estimated domestic use = production – exports*

Sources: Finnish Forest Industries Federation and National Board of Customs.

the economic recession on export markets but also the weak domestic market. Some sawmills have also been adversely affected by the shortage of sawlogs following the slump in roundwood sales and felling volumes of sawlogs. Despite the gloomy economic situation in the first half of 2009, the expectations of the Finnish wood products industry have become a little more optimistic. Buyers' sawnwood stocks have been reduced and export prices began to rise gently in the summer. Figures show that the year-on-year drop in production in 2009 slowed a little, but then accelerated as the July holiday period commenced.

Among Finland's competitors, the trend in Sweden's sawnwood exports has deviated from that seen elsewhere. Despite the weak state of the economy on the European and Japanese wood products markets, overall exports of Swedish sawnwood grew in the first half of 2009 compared with the figures for a year earlier. Exports outside Europe were up by over 30%, and export volumes to many of the main European markets, such as the UK and Germany, remained unchanged or even grew. Swedish sawnwood producers have in fact succeeded in winning market share from Finnish producers on many of the key export markets. A contributory factor in this success has been the weakness of the Swedish krona in relation to the British pound, the US dollar and the euro. Besides exchange rates, Sweden's sawnwood producers have benefited from the timber felled by the Per storm in 2007, which was still entering sawmills in 2009. However, the

strengthening of the krona has begun gradually to weaken the price competitiveness of Swedish sawnwood producers.

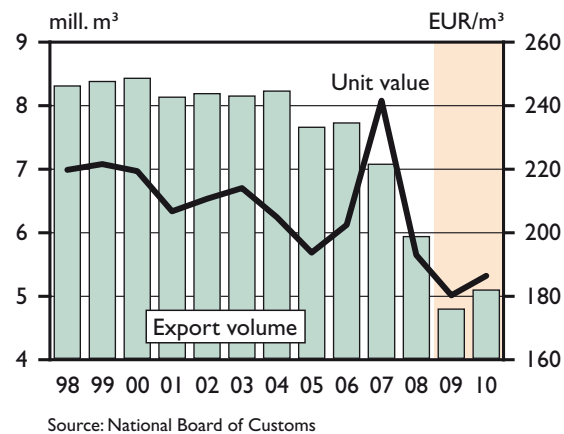
Among competitor countries, Russia's sawnwood export volumes continued to fall in the first half of 2009, and exports for the full year are likely to be about 15% below those of 2008. An exception to this is the growth of about 40% in sawnwood exports to China in the first six months of 2009. As Russia's roundwood export duties rise, China has substituted its roundwood imports with imports of sawnwood. Russia's sawnwood production for 2009 will probably be down by more than exports, by about 20%. The reasons for the drop in production are the fall in domestic and export demand and the roundwood export duties, which have had a negative impact on Russia's roundwood felling and forest industry production.

Since the economy will continue to be weak on the main export markets, no significant growth is expected in the export volumes of Finnish sawnwood in the latter part of 2009. The sawnwood export volume for the full year 2009 is expected to be about 20% below that for 2008. In 2010, exports are forecast to grow by 5% as demand begins to slowly recover on the export markets.

Slow Rise in Sawnwood Market Prices in 2010

The fall in sawnwood demand and market prices in Europe during 2008 led to major production limits being imposed. Despite these limits, prices continued their downward slide in Europe during the first half of 2009. The unit prices of Finnish sawnwood exports in January–June 2009 were about one fifth below the level of a year earlier.

However, the sawnwood production limits imposed have, since the spring, begun to affect sawnwood prices in Europe. In the United States, the price of sawnwood has risen a little since the start of the year, while in Japan the low stock levels is likely to mean that prices will start to rise in the latter part of 2009. Demand has not actually started to grow, but, rather, buyers have begun to replenish their depleted stocks. The unit prices of Finnish sawnwood exports have



Volume and unit value of sawnwood exports, 1998–2010 at 2008 prices (wholesale price index).

also begun to rise since the spring. The average export price in June 2009 had risen by over 8% from its lowest level in April. Nevertheless, the average price in June was still 10% below the June 2008 level. The price is expected to continue rising in the latter part of 2009.

Despite the end of the downward slide in unit prices of sawnwood exports, prices for the full year 2009 are still expected to be about 12% lower than a year earlier. Stronger demand for wood products in 2010 should mean a continuation of the rise in sawnwood prices. Demand growth will nevertheless be slow, and so a rapid rise in prices is not foreseen. The average unit price of Finnish sawnwood exports in 2010 is expected to rise by 6% on the 2009 figure. The tough competition, especially in Europe, will ensure that the rise in export prices is slow. Regaining the market share lost to the Swedes will depend largely on the krona exchange rate, which has already turned in a more favour direction for Finnish exporters. However, the rise in sawnwood prices, indicating a turnaround in the economy, will prompt an increase in sawnwood production within export markets themselves, which, combined with slowly recovering market demand, will effectively keep price rises in check.

The price bubble seen on the sawnwood market demonstrates the volatility of the market and the greater uncertainty in the current decade. The main reason for this change in the structure of the market is the considerable growth in sawmilling capacity in Western Europe since 2000.

Another factor fuelling the uncertainty has been Russia's political decisions on restricting exports of its roundwood.

Sawnwood Production Volumes at Early 1990s Level

In 2008, Finnish sawnwood production was down by 2.6 mill. m³, or 21%, on the previous year's figure. This corresponded to almost 30% of the approximately 9 mill. m³ drop in the entire European Union's sawnwood production. The sharp decrease in Finnish sawnwood production has continued in the first half of 2009, and has been attributable not only to the fall in demand on export markets but also the rapid contraction in domestic demand. In recent years it has been specifically the domestic consumption of sawnwood (40% of sawnwood demand in 2008) that has supported the growth in sawmilling. However, the slowdown in construction in Finland has been even more rapid than in Europe: the number of housing starts in January–June 2009 was about 40% down year on year, and, in contrast to many other countries, new construction is expected to decline further in 2010. The extended coverage of the household tax credit arrangements has led to an increase in renovation work on existing buildings, which is likely to compensate for some of the shrinkage in new construction. Despite this, sawnwood consumption in Finland for 2009 as a whole is expected to be down by one fifth. In 2010, the growth in building renovations is likely to turn the declining consumption into a growth of about 2%.

The fall in the market price of sawnwood together with the relatively high costs has had a considerable adverse effect on the profitability of sawnwood production. This has led to production cuts, and further cuts are planned. Metsäliitto, for instance, announced the closure of its Teuva sawmill in January 2009, and Stora Enso is to close its Tolkkinen sawmill at the end of 2009, and possibly its Varkaus sawmill a year later.

The precise impact of these closures on sawnwood production volumes is difficult to estimate, because the milling volumes at the remaining sawmills will be affected by any increases

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		
	2008	2009	2010	2008	2009	2010
Sawnwood	9 800 -21	7 800 -20	8 200 5	5 960 -15	4 800 -15	5 100 6
Plywood	1 265 -10	650 -49	690 6	1 081 -13	570 -47	600 5

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

	2008	2009	2010
Sawnwood	-16 (193 €/m ³)	-12	6
Plywood	3 (563 €/m ³)	-11	6

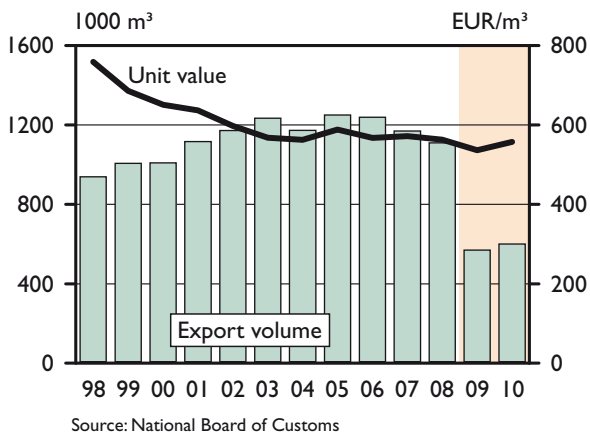
Export prices are nominal unit values

or decreases in the number of shifts worked. Sawnwood production was last at such a low level during the recession in the early 1990s.

Despite the sluggish recovery on export markets and the gloomy outlook for construction in Finland, a reversal of the decline in sawnwood production is expected before the end of 2009. In 2010, sawnwood production will rise slowly, by about 5% on the 2009 level, reaching 8.2 mill. m³. In comparison with the figures for the start of this decade, production quantities have nevertheless slumped by about 40%. Although the wood products market is not experiencing the same kind of structural change in demand as that in the market for paper products, it is probable that the level of sawnwood production will remain more permanently below the level seen in the years preceding the current recession.

Collapse in Plywood Exports

Demand and prices on the plywood export market began to weaken later than in the case of sawnwood, but in 2009 the pace has been quicker than for sawnwood. Exports and production of Finnish plywood have collapsed very dramatically: the export volume in January–June 2009 was 50% down, year on year, and production was down by



Volume and unit value of plywood exports, 1998–2010 at 2008 prices (wholesale price index)

well over 50%. The slump in plywood production was particularly marked in the case of birch plywood, which fell by almost 60%. Despite the major cuts in production, no announcements of significant closures affecting Finnish production units had been made by October 2009. No major changes in the plywood market are anticipated in the remainder of 2009.

Birch plywood production has been partially dependent on imported birch sawlogs from Russia. In 2008, Russian birch sawlogs accounted for more than one third of plywood production. Finland's birch sawlog imports in the first half of 2009 were down by almost 95% year on year as a result of the Russia's plans to raise its roundwood export duties and because Finnish companies were dismantling their Russian roundwood procurement organisations. At the same time, roundwood sales and felling volumes in Finland were at a record low. This has led to a raw material shortage specifically in birch plywood production, which, together with the fall in demand on export markets, has caused a collapse in plywood exports and production. If birch sawlog imports remain permanently at a fraction of their former levels, this will inevitably worsen the prospects for birch plywood production in Finland.

Finland's most important competitor on the Western European plywood market is Russia, which has been investing in plywood production in recent years. Russian plywood production has in fact almost doubled during the current decade. This production growth has been sustained by

the growth in domestic construction and by the country's domestic plywood consumption as Russia's economy has grown. In the first half of 2009, however, Russian plywood production was down by one third on the previous year's figure, due to the rapid contraction of domestic consumption. By contrast, exports of Russian plywood have remained almost unchanged. On the plywood export market Finland has probably lost market share to Russia.

In spite of the collapse in plywood export volumes, the fall in unit prices of plywood exports has been quite moderate in comparison with that of sawnwood. In January–June 2009, the average unit price of exports was more than 10% down, year on year. In 2008, the nominal export price of plywood rose by 3% on 2007, whereas the sawnwood export price fell by more than 16%. The uses for plywood are more diverse than for basic sawnwood, which helps to limit the fluctuations on the plywood market and has maintained the profitability of production. Neither has the European plywood market experienced oversupply of the kind seen on the sawnwood market. The drop in plywood export prices is expected to tail off in the latter part of 2009, bringing the average price for the full year to 11% below that for 2008. In 2010, with a slow recovery beginning in the economies and construction sectors on the export markets, production and export volumes of Finnish plywood will be up slightly on their 2009 levels. Plywood production is expected to rise to about 0.7 mill. m³, which is about half of the 2008 production level. As with the sawnwood export price, the rise in the export price of plywood in 2010 is expected to be quite small, at approximately 6%.

2.2 Production and Exports in the Pulp and Paper Industry

The economic crisis that deepened towards the end of 2008 led to a slump in world demand for paper and paperboard. The current recession accelerated the structural change already under way in the sector, and production capacity cuts were made in the paper, paperboard and pulp industries. The production cuts in Finland have been larger in relative terms than those elsewhere in Europe.

The demand for paper and paperboard products on Finland's export markets is expected to remain at a low level in the latter half of 2009 as well, even though a positive turnaround in the economy is already occurring. With production capacity being cut and production limits imposed, Finnish paper production and exports for 2009 as a whole are expected to be down in volume terms by almost one quarter on the previous year's figures. Production and exports of paperboard will be down by 15–17% on the 2008 figures. The production cuts made in Finland and elsewhere in Europe have enabled a small increase in market prices, and the average export prices of Finnish paper and paperboard products for the full year 2009 are expected to be up by 2%.

Although the lowest point of the recession has already been reached, economic growth is expected to be relatively low in 2010. Production and exports of Finnish paper, paperboard and pulp are forecast to grow in 2010 by about 5%. There will be further capacity cuts in the paper industry, but for many products there will still be overcapacity as demand remains low despite the slight growth in the economy. The conditions for significant price increases will not yet be in place in 2010. Nominal average export prices of Finnish paper and paperboard in 2010 are forecast to remain at around their 2009 levels.

Demand for Paper and Paperboard Collapsed in Late 2008 and Remains Low in 2009

The paper industry in Finland and elsewhere in Europe has suffered from oversupply throughout the current decade, because the growth in paper consumption is slow and production capacity has grown at a significantly faster rate than the demand for paper. During 2008 paper consumption in Europe turned onto a downward track, and the global economic crisis that began in the final quarter of the year led to a slump in the world demand for paper and paperboard. The sharpest drop occurred in the demand for printing and writing papers, but the demand for packaging board and paper also contracted markedly. By contrast, the impact of the economic crisis on the demand for tissue and hygiene papers was relatively minor. Overall consumption of paper and paperboard in Europe during 2008 fell by 3.7% on the previous year's figure. With the drop in Europe's paper and paperboard production being relatively smaller than the decrease in consumption, the market still suffered from oversupply.

Global demand for paper and paperboard products continued to shrink considerably in early 2009. According to the Association of European Publication Paper Producers (Cepiprint) and the European Association of Fine Paper Manufacturers (Cepifine), the demand for newsprint in January–July 2009 among the countries involved with the Confederation of European Paper Industries (CEPI) fell by 13% on the 2008 figures. The corresponding percentage decreases for coated and uncoated magazine papers were 25% and almost 20%, respectively. The demand for fine paper was down by about 17%. The drop in the demand for paper and paperboard products in the first quarter of 2009 was sharp, but in the second quarter this had tailed off. Demand for printing and writing papers and packaging products in Finland's main market areas will not improve significantly until the economy begins to really recover.

In North America, overall consumption of paper and paperboard in 2008 shrank by almost 8%. With production decreasing by only 5%, net exports grew substantially, by over 30%. The

	Chemical pulp	% of production	Paper	% of production	Paperboard	% of production
Production	7 159	100	10 229	100	2 897	100
Domestic use*	5 069	71	932	9	298	10
Exports:	2 090	29	9 297	91	2 599	90
EU	1 432	20	6 115	60	1 474	51
Russia	20	0	410	4	227	8
Other Europe	125	2	435	4	169	6
Asia	473	7	708	7	392	13
Africa	28	0	121	1	80	3
United States	3	0	841	8	167	6
Russia	20	0	410	4	227	8
Other	9	0	668	7	90	3

* Estimated domestic use = production – exports

Sources: Finnish Forest Industries Federation and National Board of Customs.

reduction in US consumption of newsprint and other printing and writing papers has continued for some time already, and has led to cuts in production capacity during the current decade. Growth has occurred only in the consumption and production of packaging and other papers.

Due to the economic recession, paper and paperboard consumption in Russia and the CIS countries in 2008 showed no year-on-year growth but instead remained at the previous year's level. Imports also remained unchanged, while production was up slightly. Russia's own paper and paperboard production has grown steadily, though at a slow rate, throughout the current decade. In 2008, the country's paperboard production was up by more than 5%, while paper production decreased by 2.5%.

Since 2000, Asia has been the world's largest and fastest growing consumer and producer of paper and paperboard, accounting for about 40% of the world's consumption and production. China's share of this has been a little over 50%. Paper and paperboard consumption have grown rapidly in China, more than doubling since 2000. Consumption of packaging paper and paperboard has grown significantly faster than the consumption of printing and writing papers. At the same time, China's own paper and paperboard production has grown even more rapidly, increasing by a factor of almost 2.5. This has turned China into a net exporter of paper and paperboard since 2007.

In 2008 the global economic recession was also felt in China's economy during the final

quarter, slowing the growth in paper and paperboard consumption. China's demand for paper and paperboard grew in 2008 by 'only' 9%, and the paper industry adjusted its production in line with domestic demand by introducing shutdowns. Net exports of paper and paperboard remained at the level of the previous year. In the first few months of 2009 the country's consumption growth remained slow and production limits were still imposed, but in the second half of the year consumption and production are nevertheless expected to grow as the Chinese economy recovers.

Paper Industry Cuts its Production Capacity

The collapse in demand and exports in 2008 accelerated and added to the production capacity cuts in the paper and paperboard industry that had already been planned, both in Finland and abroad. Stora Enso closed its Summa paper mill (capacity 350 000 tonnes p.a. newsprint and magazine paper), the PK 2 machine at its Anjala mill (155 000 tonnes p.a. magazine paper) and its Varkaus-based Corenso core board machine (110 000 tonnes p.a.). UPM closed its entire Kajaani paper mill (640 000 tonnes p.a. newsprint and magazine paper) and M-Real the PK 2 machine at its Kangas mill (100 000 tonnes p.a. coated magazine paper).

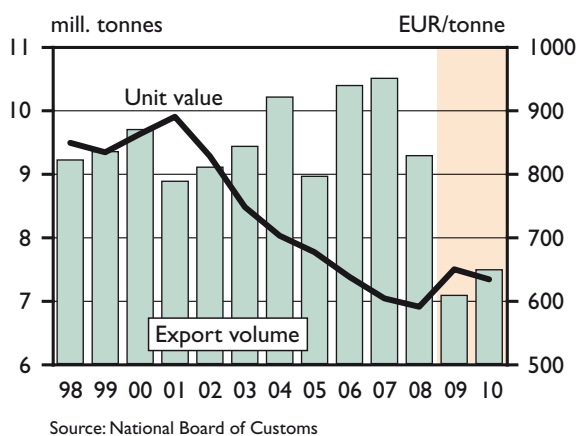
These production plant closures in Finland reduced the paper and paperboard industry's capacity by about 1.4 mill. tonnes between

the start of 2008 and the end of March 2009. The reason given for the cuts in paper industry production in Finland is poor profitability due to the continuing overcapacity in Europe and the major price rises for roundwood, energy and fuel over the past two years.

As a consequence of the production plant closures and production shutdowns, Finland's paper production in 2008 fell by 9% and paperboard production by 5% on the previous year's figures. The newsprint and magazine paper production cuts in Finland have generally been larger in relative terms than those elsewhere in Europe. In the CEPI countries, paper and paperboard production in 2008 shrank by about 4%.

With the collapse of demand for paper and paperboard products on the European market, the export volumes of all products fell in the final quarter of 2008, and especially in December. The export volume of paper in 2008 fell year on year by 12% and paperboard by 2%. Exports of newsprint were down by as much as 40% and fine paper by almost 10%.

The closures of paper mills and machines in Europe reduced the production capacity of printing papers by 3.1% in the period 2007–2008. With Europe's production of printing papers falling by only 1.6% over the same period, the capacity utilisation rate rose to 93.4% in 2008, having last reached such a high level in 2004. The overcapacity of printing papers in Europe fell from 3.7 mill. tonnes to 1.9 mill. tonnes in the period 2002–2008.



Volume and unit value of paper exports, 1998–2010 at 2008 prices (wholesale price index).

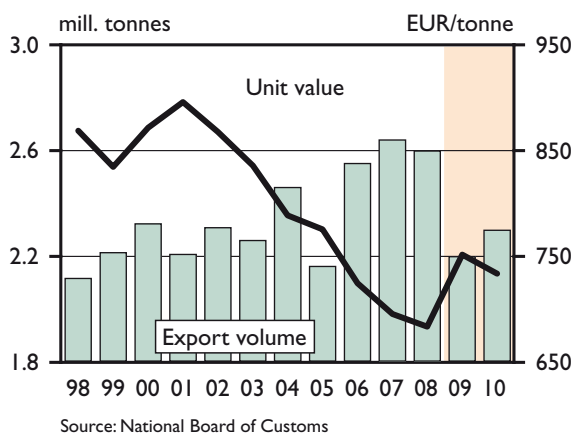
In Finland, paper and paperboard production capacity cuts are continuing. In August 2009, Stora Enso announced that it would close the PK 8 machine (210 000 tonnes p.a. fine paper) at its Imatra mill in the first quarter of 2010. In addition, Stora Enso is planning to close its Varkaus paper mills (310 000 tonnes p.a. fine paper and 290 000 tonnes p.a. newsprint and catalogue paper) completely by the end of 2010, unless the balance of demand and supply on the market for uncoated fine paper improves considerably.

Production and Exports of Paper and Paperboard Down in 2009, but Prices Stable

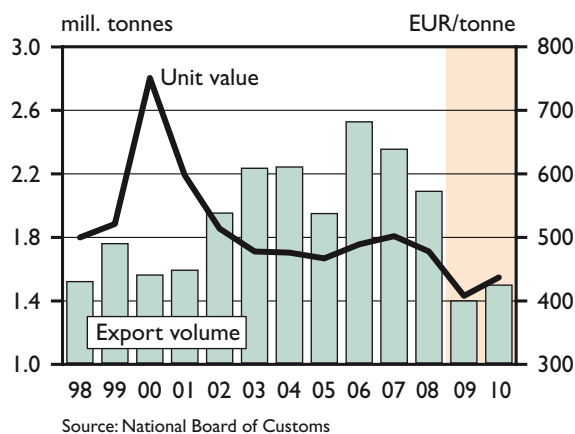
In the first half of 2009, the volume of Finland's paper exports was down by 33%, and paperboard exports down by 23%, on the previous year's figures. The export volumes were at their lowest in the early months of 2009, after which they began to climb slightly.

More than half of Finnish paper exports consist of magazine paper, while fine paper constitutes a further third. Although the market trend differs greatly from one paper grade to the next, demand for all paper and paperboard products has continued to be weak during the first half of 2009. In January–June, the export volume of magazine paper was down year on year by almost 40%, newsprint by 80% and fine paper by 20%.

The average unit prices of Finnish paper and paperboard exports in the first half of 2009 were 3–4 per cent higher than the average for the whole of 2008. Average prices of newsprint and magazine paper were about 4% higher, and fine paper 4% lower, than the 2008 average. Monthly prices of paper and paperboard rose during March–April, but fell again in June. Although paper and paperboard demand on export markets is expected to turn onto a gentle upward track as the economy improves slightly in the second half of 2009, no new price rises are anticipated in the remainder of the year. The average price of paper and paperboard exports is expected to be up by 2% in 2009 from the average for the previous year.



Volume and unit value of paperboard exports, 1998–2010 at 2008 prices (wholesale price index).



Volume and unit value of pulp exports, 1998–2010 at 2008 prices (wholesale price index).

Production and exports of Finnish paper for the full year 2009 are expected to be down by almost one quarter on the 2008 figure, due to the production capacity closures and production shutdowns. Exports and production of paperboard are expected to be down by 15–17%.

Production, Exports and Price of Pulp Down in 2009

With the contraction in paper industry production, Europe’s overall demand for wood pulp in 2008 declined. The drop in demand led to a 30% fall in the euro-denominated PIX price of both softwood and hardwood pulp in Europe in a two-month period at the end of 2008. In the countries covered by the Confederation of European Paper Industries (CEPI), the capacity utilisation rate plummeted to 90.8% in 2008. In the CEPI countries, both exports and imports of pulp were down by about 4%. More than half of pulp imports were from Latin America and one third from North America.

In the first quarter of 2009, the major production limits imposed allowed softwood pulp prices to strengthen in Europe. In the CEPI countries, production shrank by almost one fifth in comparison with the same period in 2008. Since the start of 2009, the euro-denominated PIX price of softwood pulp has gradually risen, increasing by altogether almost 10% up to the end of September. By contrast, the PIX price of hardwood pulp was again about 2% lower

than at the start of the year, because production was not correspondingly cut back in the South American mills.

In 2004–2008, North America’s production of wood pulp shrank considerably. In Canada, production fell by 6 mill. tonnes, and in the United States by 1.5 mill. tonnes. In 2008, the economic recession reduced demand in North America by 8%, and the price of pulp was falling. By May 2009, the softwood pulp PIX price in dollars had fallen by 30% since August 2008. Following this, the price then rose by about 20% to the end of September.

As Asia has been the world’s largest producer region for paper and paperboard during the current decade, it has also become a major user of fibre, especially recovered paper. Due to a shortage of wood raw material, Asia’s production of wood fibre is significantly lower than its consumption, and so Asia’s imports of wood fibre in 2008 already accounted for almost 40% of the world’s wood fibre imports. China’s share of Asia’s wood fibre consumption is almost 40%. The lack of wood raw material has led China to meet more than half of its wood fibre need through imports. The current recession has slowed the growth in China’s wood fibre consumption, and so the decline in the dollar price of hardwood pulp that began at the end of 2008 continued in the first quarter of 2009. However, the price has subsequently risen by about 40% to the end of September. The hardwood pulp price is nevertheless still about 30% lower than in the first half of 2008.

In Finland, production capacity has been reduced especially since the demand for paper and pulp collapsed in 2008. In 2008, Stora Enso closed its Kemijärvi pulp mill (capacity 235 000 tonnes p.a. bleached softwood pulp), M-real closed its Lielahi pulp mill (105 000 tonnes p.a.) and UPM its Tervasaari pulp mill (210 000 tonnes p.a.). In the first quarter of 2009, Metsä-Botnia closed its Kaskinen pulp mill (450 000 tonnes p.a.). By the end of March 2009, these production plant closures had reduced pulp capacity in Finland by about 1 mill. tonnes. Further to this, Stora Enso is planning to close its Sunila pulp mill (375 000 tonnes p.a.) in the second quarter of 2010. All these forest industry companies have also imposed significant limits on their remaining pulp production through introducing a number of shutdowns.

In the first six months of 2009, the export volume of pulp was 45% lower than a year earlier. Monthly figures show that pulp exports were at their lowest in January, after which they rose steadily to April, but then in June returned to their January level, due to production shutdowns.

The average monthly price of Finland's pulp exports fell steadily from November 2008 until April 2009, by almost 30%. The average export price of Finnish pulp in the first half of 2009 was 23% lower than the average for the full 12 months of 2008. In July, pulp demand and the price of pulp began to rise slightly, and the price of pulp is expected to rise further in the remaining part of 2009. Nevertheless, the average export price for Finnish pulp is expected to be down by 20% for 2009 as a whole.

Finnish pulp production for 2009 is expected to be down by about 16% on account of the production capacity closures and production shutdowns, and pulp exports by 30%, in comparison with 2008.

Production and Exports of Paper Products Up a Little in 2010

Growth in the consumption of paper and paperboard on the European market was already low long before the economic recession. Although a turnaround has already occurred in the economy,

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

	Production			Exports		
	2008	2009	2010	2008	2009	2010
Chemical pulp	7 159 -7	6 000 -16	6 300 5	2 090 -11	1 400 -30	1 500 5
Paper	10 229 -9	7 800 -23	8 200 5	9 297 -12	7 100 -24	7 500 5
Paperboard	2 897 -5	2 400 -17	2 500 5	2 599 -2	2 200 -15	2 300 5

Forecasts of export prices for pulp and paper products (as percentage change from previous year).

	2008	2009	2010
Chemical pulp	0 (478 €/t)	-20	10
Paper	2 (592 €/t)	2	0
Paperboard	3 (684 €/t)	2	0

Export prices are nominal unit values.

growth is expected to remain relatively low in 2010 as well. In addition, some assessments suggest that Europe's consumption of printing papers will never return to the pre-recession level, due to the market share lost by printed paper products to electronic media, and so only a minor growth in demand for paper products in Europe is forecast.

Paper industry's profitability in Finland is still relatively weak in 2009. The reasons for the paper industry's poor profitability in Finland are the high production costs in relation to competitor countries and in relation to the price of end products. The costs of wood raw materials, in particular, rose in 2007 by almost 30% and have remained high right through to 2009, because industry stocks have included a large amount of domestic and foreign softwood pulpwood procured at high cost. In hardwood pulp production, Finland is not competitive against the new pulp mills of South America, for example, because the wood raw material costs are significantly lower there. Moreover, Finland's competitiveness in magazine paper production is weaker than that of Central and Western European producers, because they use recycled fibre, which is a lot cheaper than roundwood.

A major continuing problem for Finland's competitiveness in relation to, for instance, European competitor countries is the high transport costs incurred due to the long distances to the main markets. The means employed by the Finnish paper and paperboard industry to improve its profitability have been not only to lower production costs but also to reduce production in Finland by cutting production capacity, which will continue to be the case in 2010.

The planned capacity cuts in Finland and elsewhere in Europe will reduce overcapacity and create the conditions for a rise in prices. However, the beneficial effect for the paper industry of the rise in prices will not be great due to the slow recovery in the economy and the slow growth in paper demand in the industry's main export markets. Indeed, the average export prices of paper and paperboard in 2010 are forecast to remain at around their 2009 levels, but the price of pulp is expected to rise by 10%. Production and exports of Finnish paper, paperboard and pulp are forecast to grow in 2010 by about 5%, due to the cuts in production and the very low growth in demand.

2.3 Costs and Profitability in the Finnish Forest Industry

The financial statements of the major Finnish forest industry corporations show that the profitability of the Finnish wood products industry fell to an unprecedentedly low level in 2008. This collapse was due to the global economic crisis, which reduced the consumption of wood products, causing oversupply and a further fall in the export prices of wood products. During 2009, no significant improvement has occurred in the profitability of the wood products industry, and the situation is expected to continue unchanged to the end of the year. Profitability in the wood products sector is likely to improve in 2010, probably reaching the level seen around the mid-point of the current decade.

Like the wood products industry, the marked deterioration in the pulp and paper industry's profitability that began in 2008 has continued. During 2009, the price trend in pulp and paper products has improved marginally, but any improvement in the sector's profitability will not be seen until 2010, despite the business efficiency improvements undertaken and the favourable developments in overall costs.

Wood Products Industry Will Gradually Return to Profitability

The financial statements of the major Finnish forest industry corporations (Metsäliitto, Stora Enso and UPM) show that the profitability of the wood products industry plummeted to an unprecedentedly low level in 2008. This gloomy news was due to the global economic crisis, which reduced the consumption of wood products, causing oversupply and a further fall in the export prices of wood products. The situation for the sector as a whole has deteriorated further during 2009, although there are considerable variations in profitability between companies in the sector. At the sectoral level, there is no likelihood of loss-making activities becoming profitable before the end of 2009.

To improve their business operating potential, the forest industry companies have continued to introduce temporary production limits and permanent capacity cuts during 2009, as they have done in recent years, in the hope of reducing both variable and fixed costs. Operations have been reorganised in the sawmilling and plywood industries, within units of all the major Finnish forest industry corporations. The slowdown in demand for end products has reduced the price of wood raw materials, but the impact on production costs has been minor, in 2009 as well, because companies have, for the most part, been using more expensive raw materials acquired in earlier years. The fall in demand in the second half of 2009 is forecast to slow, and at the same time sawnwood market prices are expected to rise gradually as stocks run down

and demand from wholesale purchasers grows. On the plywood market, demand began slow down later than on the sawnwood market, and no significant improvement is expected in the overall demand for plywood or in plywood prices before the end of 2009.

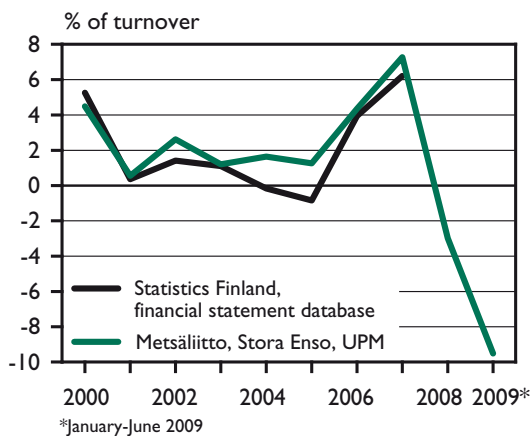
A recovery in the wood products industry as a whole is anticipated in 2010, bringing it back into profitability, marking a return to the level prevailing at the mid-point of the current decade. The reasons for such a recovery will be a revival in new housing construction and in renovations as a result of growth picking up in the economy, a fall in production costs on account of the capacity cuts planned or already made, the gradual rise in market prices of wood products and the moderate increase in roundwood costs in all roundwood categories. About one third of the overall costs for all subsectors of the wood products industry consists of wood raw material and its transportation, which is why roundwood prices have such an important influence on the operating potential for companies.

Based on the financial statements database maintained by Statistics Finland, the profitability trend in the wood products industry up to 2007 accorded with what might be expected on the basis of financial statements data for the wood products businesses of the three largest forest industry corporations. These calculations did not

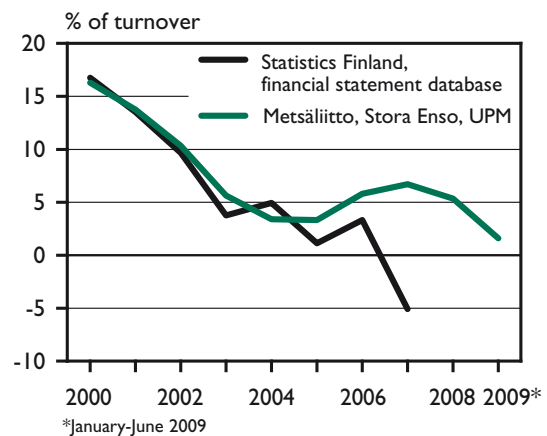
take account of the subsectoral data for 2008, which was not yet available from Statistics Finland. The profitability indicators used here were operating profit as a percentage of turnover (for Stora Enso and UPM) and EBIT as a percentage of turnover (for Metsäliitto and the Statistics Finland data). The figure for EBIT as a percentage of turnover is based on adjusted financial statements, and the operating profit as a percentage of turnover is based on unadjusted financial statements, and so they are not fully identical as profitability indicators. The Statistics Finland dataset has data only on production units located in Finland, whereas the data from the financial statements of the major forest industry corporations also covers operations outside Finland. Furthermore, the Statistics Finland dataset includes not only data on large companies but also on small and medium-sized companies, the latter category constituting about one third of the turnover in the wood products sector in the current decade.

Pulp and Paper Industry Profitability Gradually Turning on to Gentle Growth Track

According to the financial statements of the major Finnish forest industry corporations (Metsäliitto, Stora Enso and UPM), the profitability of the



Profitability in the wood products industry, 2000–2009, measured in terms of operating profit as a percentage of turnover and EBIT as a percentage of turnover¹.



Profitability in the pulp and paper industry, 2000–2009, measured in terms of operating profit as a percentage of turnover and EBIT as a percentage of turnover¹.

¹ The profitability data for Metsäliitto and Statistics Finland is based on the calculation of EBIT (operating result) as a percentage of turnover, using adjusted financial statements data. The calculation of the profitability of Stora Enso and UPM is based on operating profits as a percentage of turnover, using unadjusted financial statements data.

pulp and paper industry for the full year 2009 will show a continuation of the dramatic downturn in the industry. The deteriorating profitability trend that began in 2008 is attributable to the global economic recession, as a consequence of which the demand for every paper grade was down year on year in all market areas. At the same time, corporate profitability was chipped away considerably by the higher wood raw material and energy costs. The demand for pulp and paper for the full year 2009 will still be low in relation to the pre-recession years, although a slight improvement will have already occurred in relation to the start of the year, on account of the capacity cuts, production limits and the small rise in paper export prices.

Forecasts suggest that the pulp and paper industry's profitability will start to improve in 2010. This improvement will be attributable to a revival in demand, the low growth in raw material costs compared with 2009, and the productivity impact of business efficiency measures planned or already undertaken. A key factor in the profitability trend will also be the cost trend for the minerals and chemicals used in production processes and the level of transportation costs. Both these cost items are linked in key respects to the price of energy, which has been falling during 2009. It must be remembered, however, that decisions on combating climate change will have a significant impact on the costs of energy and transportation in the next few years, and could even have a very considerable adverse effect on the cost competitiveness of the Finnish forest industry. The costs of minerals and chemicals will also play an important role in competitiveness, as these costs are affected not only by energy prices but also by the prices of raw materials used in their manufacture and by fluctuations in global demand.

The figures in the financial statements of Metsäliitto, Stora Enso and UPM, and those in the Statistics Finland dataset give a very conflicting picture, especially for 2007, of the pulp and paper industry's profitability in the period prior to the current recession. The financial statements of the three major forest industry corporations show that the pulp and paper industry was profitable in 2007, whereas the Statistics Finland dataset indicates that the profitability of both Finnish-owned and foreign-owned pulp and paper industry units located in Finland had already slumped in 2007. The latter conclusion appears to represent a more realistic picture of the recent trend in the competitiveness of Finnish-based pulp and paper industry units, although there are also many uncertainties surrounding the figures. As in the analysis of the wood products industry, the measure of profitability used here is operating profit as a percentage of turnover (for Stora Enso and UPM) and EBIT as a percentage of turnover (for Metsäliitto and the Statistics Finland dataset).

There are a number of unanswered questions concerning the recovery in the forest industry's profitability, and these are related to the cost structure of both the wood products industry and the pulp and paper industry. Although the price of energy has been falling in 2009, there are so many uncertainties regarding energy taxation in the near future that could affect the competitiveness of the Finnish-based forest industry in different ways. Sea freight prices fell by a record amount in the first half of 2009, but the rise in crude oil prices has meant that the cost of sea transport has again risen in recent months. The costs of sea transport will probably rise further in the next few years as a result of sea transport emissions trading and tighter sulphur and nitrogen emissions limits, in both the wood products industry and the pulp and paper industry.



3 Forestry in Finland

3.1 Utilisation of Wood Resources

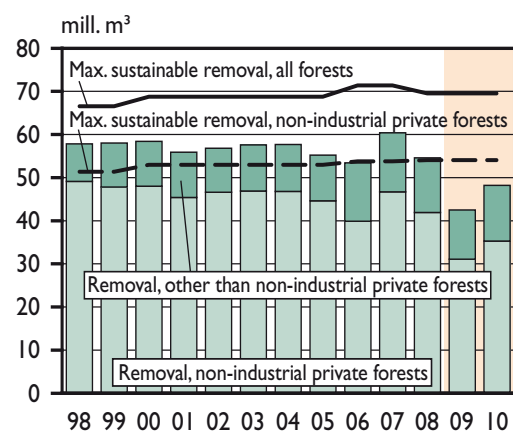
In recent years, almost a quarter of the Finnish forest industry's roundwood procurement has consisted of imported roundwood, even though Finland has abundant forest resources. This situation is changing, however, because imports of roundwood are falling considerably. If birch imports also fall, it will not be possible to compensate for this by procuring similar volumes domestically. In 2006–2008, the industry used an average of 74 mill. m³ of roundwood annually, of which 56 mill. m³ was domestic roundwood. These figures do not apply at all to 2009 though, as roundwood consumption is expected to have dropped to 50 mill. m³ for the year.

Finland has almost 23 mill. ha of forest, and the total volume of growing stock is approximately 2200 mill. m³. Pine accounts for 50% of this, spruce for 30%, birch for 17% and other broad-leaved species for 3%. The annual increment in the growing stock is about 99 mill. m³. Some 2.4 mill. ha of forest, mainly in Northern Finland, is 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 2000 mill. m³ with an annual increment of almost 97 mill. m³ (or 4.8%). Growing stock drain amounts to about 69 mill. m³ p.a. (or 3.4%), and so roundwood reserves are increasing by a small amount each year.

The maximum sustainable removal is approximately 70 mill. m³ of useful wood per year,

while the maximum justifiable in silvicultural terms (maximum potential removal) is as much as 94 mill. m³, taking account of all tree species. The annual removal of roundwood meeting the dimensional requirements for industrial wood in recent years (see figure) has been about 56 mill. m³, or 80% of the calculated maximum sustainable removal. In non-industrial private forests, the proportion of the maximum sustainable removal harvested is slightly higher.

Some 63% of Finland's commercial forests are in the possession of non-industrial private owners, 22% are owned by the state, 9% by companies and 6% by other groups of owners. The state's forest ownership is concentrated in Northern Finland, which is why the average increment in the growing stock for the state's holdings is low compared with forests in other ownership. Forests in non-industrial private ownership account for 70% of the growing stock increment, state-owned forests for 13%, company-owned forests for 11% and the rest



Source: Finnish Forest Research Institute

Removals of industrial wood and maximum sustainable removal, 1998–2010.

for 6%. The non-industrial private forests are of crucial importance for the industry's roundwood procurement, as about 75% of the domestic roundwood (and almost 55% of all roundwood, both domestic and imported) consumed by the forest industry is from such forests. The volume of imported roundwood has risen to 25% of the total. This situation is changing, however, as imports of roundwood for the full year 2009 will be down by half on the 2008 figure.

The accompanying 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 Finnish Forest Research Institute's calculation is an optimisation calculation, in which the relative prices of different roundwood categories affect the structure of the estimates of maximum sustainable removal.

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. Spruce harvests, for example, have been very high in recent years, and spruce reserves have decreased slightly since 2000.

Roundwood imports from Russia have collapsed in 2009, due to high prices and other factors. Though Finnish roundwood resources are easily sufficient to replace imported Russian pine, there will be a scarcity of spruce, and domestic birch will only be sufficient to replace a proportion of imported Russian birch. As part of its process of adjustment to changed circumstances, the pulp industry has begun to replace birch with pine.

Though non-industrial use of roundwood – principally household firewood – is also of importance in forest management terms, its main

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

Tree species	Consumption 2006–2008, mill. m ³ /yr		% of maximum sustainable removal	
	Domestic wood	Wood total	Domestic wood	Wood total
Pine	25.6	28.3	80	88
Spruce	22.6	26.0	93	107
Birch	7.6	15.6	70	143
Total	55.8	69.9	83	104

In addition, the industry consumed 3.6 mill. m³/yr of aspen and unspecified imported wood.

Source: Finnish Forest Research Institute

significance is in terms of energy use. In the tending of young stands, an increasing volume of small-sized trees are chipped into energy wood.

The aims of the National Forest Programme 2015 (2008) include an increase in the use of domestic industrial wood and energy wood. This aim has now risen in prominence considerably, as it is now known that roundwood imports from Russia have collapsed. The National Forest Programme states that this aim will require forest owners to engage more actively in using advisory services on the potential of their forests.

Overall use of domestic industrial wood has not grown since 2000, although it did increase to a record level in 2007 (59 mill. m³), falling again during 2008 (52 mill. m³) with the decline in the industry's production and when there was still plentiful supplies of imported wood. By contrast, the use of wood chips (mainly felling residues from clear cutting) for energy purposes has risen rapidly in the current decade. In recent years, approximately 3 mill. m³ in wood chips has been used annually in thermal and other power plants, and in 2008 this figure had already risen to 4 mill. m³ (see featured topic, p. 38). Such use of wood material unfit for industrial products is very high: wood-based energy accounts for about 20% of all energy consumed in Finland and about 60% of the Finnish forest industry's energy consumption (black liquor from the pulp industry, tree bark, sawdust, etc.).

3.2 Roundwood Markets

Commercial fellings in 2009 will not exceed a total of approximately 40 mill. m³. Commercial fellings in non-industrial private forests are down by 26%, whereas fellings in company-owned forests and in forests owned by Metsähoitajat are down by 15%. Imports of roundwood for the full year 2009 are expected to be just half of the previous year's figure, falling to less than 10 mill. m³. Despite the decline in felling volumes and imports, stocks of harvested wood are still high.

The demand for softwood sawlogs is increasing, and it is expected that this will prevent any further decline in their stumpage prices. Stumpage prices for the year as a whole will nevertheless be 23% below the average for 2008. The market for birch plywood is weak, and the demand for birch sawlogs has consequently been low. The remainder of 2009 will see further downward pressure on pulpwood stumpage prices as a result of the large stocks of roundwood and the cuts in paper and pulp capacity. Although the price level will not rise, the roundwood sales revenue tax relief still available in 2010 is expected to improve roundwood supply in the latter months of 2009. In contrast to other roundwood categories, the demand for forest energy has been good in 2009, and the use of wood chips for thermal and other power plant use is forecast to be up in 2009 to 4.5 mill. m³.

In 2010, forest industry production will be up slightly, and the industry will prepare for this growth by keeping roundwood stocks high. Commercial fellings will be up by 15% on the 2009 figure, as roundwood imports are expected to remain at their 2009 level. Nominal stumpage prices of softwood sawlogs will rise by 4–8%, as sawnwood production growth will boost the demand for sawlogs. The fall in birch sawlog stumpage prices is expected to be reversed into a slight rise. Stumpage prices of softwood pulpwood will remain at close to their 2009 levels as the reduced volumes of imported roundwood and domestic sawmill chips will be replaced with domestic pulpwood from thinning, in particular. However, birch pulpwood stumpage prices are

expected to decline further. The demand for forest energy will continue to be good, and thermal and other power plant use is forecast to grow to 5.5 mill. m³.

Trough Turning into Recovery in 2009

In 2009, the roundwood market has been affected by an exceptional number of negative factors simultaneously. Between 1993, which was the start of the forest taxation transition period, and 2007, the volume of final cutting in forests in non-industrial private ownership was high, but since 2007 the supply of roundwood has been inexorably switching over to thinnings. In preparing for Russia's programme to increase its export duties on roundwood, the pulp and paper industry, in particular, expanded its stocks of harvested roundwood significantly during 2008, through both imported roundwood and domestic wood from first commercial thinning. The closures and shutdowns of wood processing production units have reduced the demand for wood on the roundwood market in 2009. Almost the only positive factor on the roundwood market has been the growth in domestic demand for forest energy.

In the first half of 2009, the demand for roundwood was low, which in turn caused a steep drop in stumpage prices. The nominal stumpage price of pine sawlogs, for instance, was almost 30% lower in June than a year earlier, and more than 40% below the summer 2007 peak in prices. Softwood sawlog stumpage prices are nevertheless expected to have risen slightly since the summer, due to the gradual pick-up in sawnwood demand and production. Pulpwood prices are continuing to be kept in check by the drop in demand resulting from the production limits and capacity closures in the pulp and paper industry, and the high level of harvested roundwood stocks. The average 2009 prices of both sawlogs and pulpwood are expected to be down by 23–26% on the 2008 figures.

Key factors affecting the roundwood market currently are the cautious recovery in softwood

Commercial fellings, roundwood imports and end-of-year stocks of harvested wood, 2008–2010.

Roundwood type/ Ownership group	2008 mill. m ³	2009 mill. m ³	Change %	2010 mill. m ³	Change %
Commercial fellings, total	51.7	39.6	– 23	45.3	15
Non-industrial private forests ¹	41.2	30.6	– 26	34.8	14
Company and state-owned forests ²	10.5	9.0	– 15	10.5	17
Sawlogs	21.5	14.9	– 31	16.9	14
Pulpwood	30.1	24.6	– 18	28.3	15
Roundwood imports	20.0	9.4	– 53	9.5	1
Commercial fellings and roundwood imports, total	71.7	49.0	– 32	54.8	12
Stocks of harvested roundwood	16.7	13.6	– 18	13.1	– 4

¹ Includes municipalities, parishes, etc.

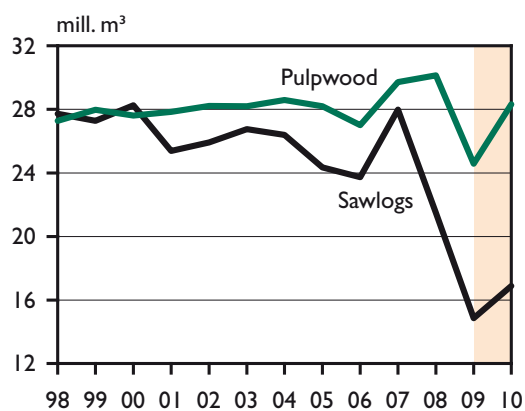
² Metsähallitus manages state-owned forests

Sources: Finnish Forest Research Institute and National Board of Customs.

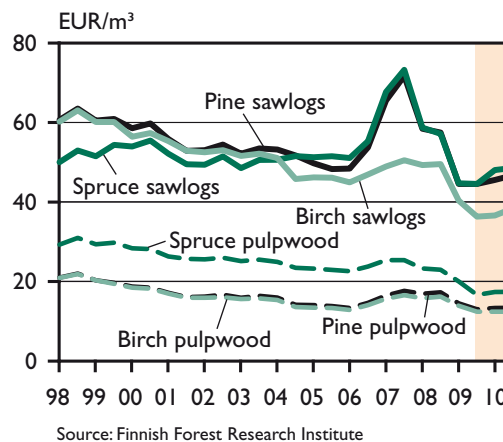
sawlog demand and the fixed-term tax relief on income from roundwood sales, which was enacted in July 2008 with the aim of balancing out the effects of fluctuations in the economy. The tax relief has boosted roundwood supply by narrowing the gap between the current solvency of buyers and the price expectations of sellers waiting for an improvement in the economy. Roundwood sales in 2009 will be weighted towards the final months of the year. In January–September, only 5.7 mill. m³ was purchased, which in a normal year would be the amount bought by the end of February. The decline in felling has been more moderate, due to the good winter for timber harvesting. In the spring, felling volumes collapsed, however. In all, sawlog fellings in January–August were just

over one third, and pulpwood fellings almost one fifth, below the average for the previous five years.

Commercial fellings for the whole of 2009 are forecast to be down by 23% on the 2008 figure, to about 40 mill. m³. Commercial fellings in forests in non-industrial private ownership will be down by 26% to 30 mill. m³, and fellings in company-owned forests and in forests owned by Metsähallitus will be down by 15% to 10.5 mill. m³. Due to the drop in sawnwood production, commercial fellings of sawlogs are expected to have fallen in 2009 by as much as 31%, whereas for pulpwood the reduction is estimated at only 18% on account of the stocks of harvested roundwood having been maintained. Harvested roundwood stocks are expected to remain high in



Commercial fellings of sawlogs and pulpwood, 1998–2010.



Semiannual stumpage prices by roundwood category, 1/1998–2/2010 at 2008 prices (cost of living index)

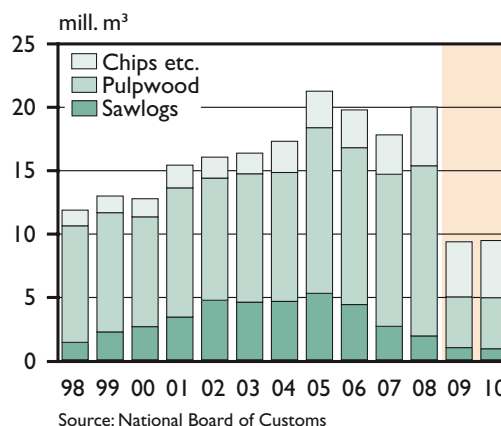
the latter part of 2009. The importance of domestic stocks in the forest industry's roundwood procurement is increasing, because the volume of roundwood imported from Russia or stored on the Russian side of the border is declining. Domestic stocks of harvested roundwood at the end of 2009 are estimated to be almost 14 mill. m³, which is approximately 5.5 mill. m³ more than the average for 1999–2008.

Commercial Fellings Up Slightly in 2010

The demand for wood products, pulp and paper on the most important export markets is picking up slightly in the second half of 2009, but the increase in production is expected to be low still. In 2010, the combined total of commercial fellings and roundwood imports is forecast to grow by 12% to about 55 mill. m³. Stocks of harvested roundwood will again be quite high, at about 13 mill. m³. Commercial fellings are forecast to increase to 45 mill. m³. Sawlog and pulpwood removals will be up by almost the same percentage on the 2009 figures. Thinnings are again expected to account for a high share of the total. As the harvesting costs for thinnings are greater than those for final cutting, sawlog stumpage prices are forecast to rise by only 4–8% on the 2009 figures, while pulpwood stumpage prices will remain close to the 2009 level.

Forest Industry Relying on Domestic Roundwood

Although in 2008 the Finnish forest industry was still importing Russian roundwood, it was making preparations for imports of Russian sawlogs and pulpwood to stop completely as a result of the Russia's proposed increase in its export duties on roundwood, to a minimum of EUR 50/m³, which was to take place on 1 January 2009. The late 2008 decision to postpone the duty increases no longer had a major effect on the situation. The coincidental timing of the duty decisions and the deep recession in export markets has hastened the structural change in the Finnish forest industry that had already begun earlier.



Volume of imported roundwood by category, 1998–2010.

Average stumpage prices in non-industrial private forestry, 2008–2010.

Roundwood	2008 EUR/m ³	2009 EUR/m ³	Change %	2010 EUR/m ³	Change %
Pine sawlogs	57.7	44.5	-23	46.5	4
Spruce sawlogs	57.6	44.5	-23	48.2	8
Birch sawlogs	49.4	36.7	-26	38.1	4
Pine pulpwood	17.1	13.1	-23	13.3	1
Spruce pulpwood	23.0	17.0	-26	17.4	2
Birch pulpwood	16.0	12.6	-22	12.4	-2

Source: Finnish Forest Industries Federation and Finnish Forest Research Institute

In January–July 2009, Finland's imports of roundwood amounted to only 4.7 mill. m³, which is 40% of the level of a year earlier. Finland's imports from almost all the main exporting countries have fallen at almost the same rate. Due to the postponement of the duty decisions, the biggest share of imported roundwood was again from Russia, at 63%. The composition of the imports in terms of the roundwood categories represented has changed significantly, however. The imported volume of the most important roundwood category of previous years, namely birch pulpwood, fell by 84% year on year. Imports of pine and spruce pulpwood were also down by over 70%. The most important category of imported roundwood was wood chips, which totalled 1.6 mill. m³ (36% of the total). Imports of firewood increased in January–June more than 15-fold (to 0.7 mill. m³) year on year. Since the start of 2009, wood chips, firewood and wood

residues together accounted for as much as 60% of all the wood imported from Russia. The total volume of wood imported to Finland for the full year 2009 is expected to be a little less than 10 mill. m³, and no increase on this figure is expected in 2010.

New Thermal and Other Power Plants Boost Growth in Forest Energy Use

Roundwood sales in the first half of 2009 have been maintained almost exclusively by the good demand for forest energy. Felling residues and stumps obtained in final cutting and small-diameter trees obtained from improvement felling or first thinning in young stands are used for making wood chips. Poor quality large-diameter trees are also used for this purpose. In 2008, the use of wood chips in thermal and other power plants was approximately 4 mill. m³, from which about 8 TWh of energy was obtained.

The use of wood chips for the full year 2009 is forecast to grow to about 4.5 mill. m³. This growth still represents only a moderate increase in stocks, as the industry is engaged in preparing for the 2010 introduction of new power plants currently under construction.

The use of wood chips in 2010 is forecast to grow to about 5.5 mill. m³. The use of wood chips will also be boosted by the decrease in the volume of the forest industry's by-products and waste products for energy use in comparison with the years before the current recession. With felling residues from final cutting making up a smaller proportion of the total, the use of chips derived from small-diameter trees, though more expensive in terms of harvesting costs than conventional wood chips, is likely to push up the factory price of wood chips to about EUR 18/MWh.

3.3 Investment and Profitability in Non-Industrial Private Forestry

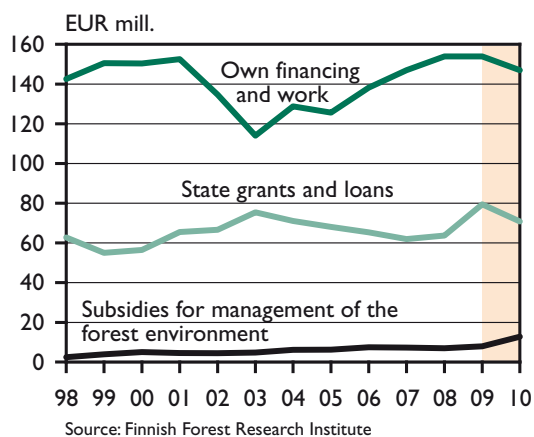
Total investment in timber production in Finnish non-industrial private forestry for the full year 2009 will rise to over EUR 230 mill. The amount of financing and work input by private forest owners in timber production investments in 2009 will amount to more than EUR 150 mill. of this total. Government subsidies are up by EUR 16 mill. on the 2008 figure, to approximately EUR 80 mill.

The deep recession in the forest sector is pushing down the operating profit from non-industrial private forestry to a level of EUR 42–46/ha, and the drop in stumpage prices will also mean a collapse in the real return on assets for 2009. In 2010 the operating profit will improve, but will remain significantly below the long-term average.

Clear Cutting When Roundwood Sales Were Good is Increasing Artificial Regeneration Costs

Total investment in timber production in Finnish non-industrial private forestry for the full year 2009 will rise to over EUR 230 mill. In 2010, the amount available in state subsidies under the Act on the Financing of Sustainable Forestry is likely to be almost EUR 10 mill. less than in 2009. Total investment in 2010 will be down considerably on the 2009 level.

In 2008, financing by private forest owners themselves rose to over EUR 154 mill. The corresponding figure for 2009 will be almost the same, but in 2010 it will be down somewhat. By contrast, the area for artificial regeneration as a result of the large amount of clear cutting in recent years has reached peak levels in 2009. In all, the amount of financing and work input by private forest owners in forest regeneration work in 2009 will be about EUR 75 mill. A total of EUR 80 mill. has been reserved in government funding for work to ensure sustainable roundwood production for 2009.



State and forest-owner funding of investments in non-industrial private forestry, 1998–2010 at 2008 prices (cost of living index).

Tending of Young Stands and Energy Wood Again Account for Growing Share of State Subsidies

The government budget proposal for 2010 includes approximately EUR 71 mill. in state subsidies for work to ensure sustainable roundwood production, of which about EUR 55 mill. would be for the actual labour costs. Tending of young stands, harvesting of energy wood and chipping are all accounting for a growing share of state subsidies. In 2010, over EUR 30 mill. will be used for these, of which a quarter is likely to be for harvesting and chipping. Energy wood subsidies will help achieve the aim of boosting the use of renewable energy. It is possible that in 2010 the use of wood chips will already be half way (6 mill. m³) towards the 2020 target set for their use.

The increased subsidies will help achieve the ambitious targets set out in the National Forest Programme. Good results were already achieved in 2008 in the tending of young stands and construction of forest roads. Ditch cleaning and supplementary ditching fell shortest (60% attainment) of its target of 100 000 ha.

EUR 5 Mill. Extra in Subsidies for Management of the Forest Environment

The commitment of the government to the National Forest Programme and to the related Forest Biodiversity Programme for Southern Finland is visible in the growing level of

appropriations: EUR 8 mill. for 2009 and EUR 13 mill. for 2010. The appropriations have tripled in less than a decade.

Most of the appropriations intended for management of the forest environment are in the form of an environmental subsidy aimed at securing the biodiversity of the forest environment. The rest of the appropriation is for funding the expenditure incurred in projects for managing the forest environment.

Investment Rate in Timber Production in Non-Industrial Private Forests at its Peak

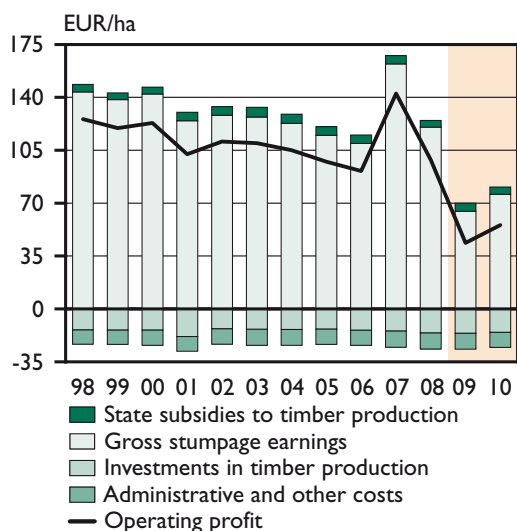
Stumpage earnings in non-industrial private forests in 2008 amounted to almost EUR 1.6 billion, which was down by almost 25% on the 2007 total. Stumpage prices in 2009 have continued to fall from the previous year's level. Felling volumes are also significantly below their level of 2008. For private forest owners this means a drop in stumpage earnings to EUR 850 million. With roundwood sales picking up in 2010, stumpage earnings are likely to rise by 10–15% on the 2009 figure.

Investment in timber production in non-industrial private forestry in recent years has accounted for 9–14% of gross stumpage earnings. This investment has focused strongly on artificial regeneration of clear cutting areas and

Non-industrial private forestry balance sheet calculation for 2008 and forecast for 2009 and 2010, EUR/ha.

	2008	2009	2010
Gross stumpage earnings			
Whole country	120.5	64.7	76.1
Southern Finland	149.3	81.4	96.5
Northern Finland	60.0	29.5	29.7
– Gross costs			
Whole country	26.2	26.3	25.1
Southern Finland	30.5	30.6	29.5
Northern Finland	17.2	17.3	17.3
+ Subsidies			
Whole country	4.5	5.4	4.8
Southern Finland	4.2	5.2	4.6
Northern Finland	4.9	6.0	6.0
= Operating profits (before taxes and external capital costs)			
Whole country	98.7	43.9	55.8
Southern Finland	123.0	56.0	71.7
Northern Finland	47.7	18.3	18.4

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



Source: Finnish Forest Research Institute

Earnings, costs and operating profit in non-industrial timber production, 1998–2010 at 2008 prices (cost of living index).

on the tending of young stands. The investment rate for the full year 2009 will rise to a record 28%. In 2010 the investment rate will fall to about 23%, which is about the level seen in the recession years of the early 1990s.

Sharp Drop in Operating Profit for Timber Production

The current economic recession began to affect the forest sector in the final quarter of 2007, and by early autumn 2009 there were still no clear signs of an improvement in the economy. Between the start of 2008 and summer 2009 stumpage prices had fallen in real terms by 19% for spruce pulpwood and by 25–28% for all other roundwood categories. The forest industry is cutting capacity and shutting down machines due to the market difficulties. Roundwood stocks are high, with the exception of softwood sawlogs. A positive factor in 2009 was the occurrence of cold winter conditions in Southern Finland, as this enabled the substantial reserves in winter stands to be accessed.

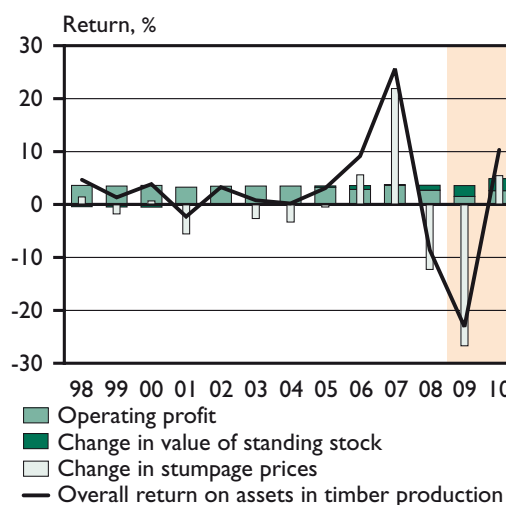
Stumpage prices, however, are at rock bottom in 2009, and the declining level of fellings has pushed down gross stumpage earnings to EUR 63–67/ha. In real terms, such a low point was last reached in the recession years 1992 and 1993. Total per-hectare costs of timber production for

2009 are, however, unchanged from the 2008 figure, at EUR 26/ha. In 2010, earnings will rise by about EUR 10/ha, but will nevertheless still be about 40% below the average for 2004–2008.

The operating profit from non-industrial private forestry for 2009 will be down to EUR 44/ha (before taxes). This is significantly less than half the average for the previous five years (EUR 111/ha). In 2010, the growing demand for softwood sawlogs is expected to push up their stumpage prices, and the tax relief still in force will encourage private forest owners to engage in felling and roundwood sales. Despite this, the per-hectare operating profit is likely to be less than EUR 60/ha.

Sharp Drop in Return on Assets in Timber Production Continues in 2009

As a result of the fall in stumpage prices in 2009 the return on assets in timber production has plummeted to -23%. This is the second successive year of such a precipitous drop and almost exactly mirrors the steep climb seen in 2006 and 2007. These fluctuations in the return are now even greater than those seen at the descent into recession in the early 1990s and the subsequent emergence from it. 2009 represents a trough in terms of the return on assets, with a recovery expected in 2010, when even a fairly lacklustre rise will push up the return to around 10%.



Source: Finnish Forest Research Institute

Overall real return on assets in timber production, 1998–2010 at 2008 prices (cost of living index).



Featured Topics

Forests, Wood Products and Climate Policy

Tarmo Rätty

Forests have three key roles in climate policy. Firstly, forests sequester carbon dioxide from the atmosphere as they grow. Secondly, wood products in different forms store carbon that was initially captured from the atmosphere. Thirdly, wood can replace energy-intensive materials or, directly, fossil energy sources. Research has demonstrated that these roles do not conflict with each other. This article discusses first the climate policy potential of wood products in Finland and then goes on to examine forests and wood products in the light of the climate negotiations taking place in autumn 2009.

The agreements on limiting greenhouse gas emissions under the Kyoto Protocol to the UN Climate Convention extend to 2012. The countries that have ratified the Protocol must submit a national greenhouse gas inventory annually to the UNFCCC Secretariat. The inventory is required to give estimates of anthropogenic greenhouse gas emissions into the atmosphere and removals from the atmosphere into so-called sinks. In Finland, forests and wood products are categorised as sinks. In 2007, 32.8 mill. tonnes of carbon dioxide was sequestered by Finnish forests and 1.2 mill. tonnes stored in wood products. These figures correspond to less than half of the country's emissions from the energy supply sector, industry and transport.

Reporting on changes in the forests' carbon store is mandatory under the Kyoto climate treaty. No such obligation applies to wood products. The actual emissions trading system extends only to emissions from the energy supply sector and industry. Negotiations on a successor to the Kyoto climate treaty are being undertaken in autumn 2009. The most significant change will be the stronger climate policy commitment of the emerging economies and the developing countries. In setting national climate policy obligations it will also be necessary to reassess the reporting practices for forest management and land use changes and for wood products, and the significance of these.

Potential Role of Wood Products in Finland's Climate Policy

Construction accounts for about 70% of the domestic consumption of Finnish sawnwood. The wood contained in the country's building stock is therefore central to any assessment of the size of the carbon store. Information on the frame, cladding and floor materials of the building stock and of the civil and hydraulic engineering structures is being collected in national statistics. A comprehensive estimate of the carbon stored in the building stock has been made at approximately five-year intervals since 1990.

The inventory shows that the carbon store in buildings and other wood-based products is approximately 21 mill. tonnes. Detailed information on the relative size of this carbon store for comparison purposes is not available, but the figure is large in international terms. The figures show that Finns use five times more wood products than the EU average. The climate policy goal for construction is to increase the long-term carbon store. The carbon store has been growing at about 1.5% annually in recent years. Although this corresponds to only a small proportion of Finland's annual greenhouse gas emissions, it is a very inexpensive way of bringing about change, as timber construction has a significant multiplier effect on fossil-based greenhouse gas emissions.

The use of wood products can replace fossil energy sources, both directly and indirectly. Using wood as a fuel is climate neutral: it releases no more carbon dioxide into the atmosphere than that which was sequestered by the growing tree. If the wood is from a sustainably managed forest, the carbon balance sheet will remain in balance when the forest is regenerated. However, if the wood replaces the use of oil, gas or peat, which contain fossil-based carbon, the use of wood will actually reduce anthropogenic greenhouse gas emissions.

Indirectly, the use of wood can be a significant replacement for fossil-based greenhouse gas emis-

Table 1. Carbon dioxide balance sheets for different construction units. Embodied emissions in production less sequestered CO₂, CO₂ kg/m².

	Concrete	Breeze block	Brick	Steel	Wood
External walls	90	65/58	96	70	-13
Interior walls	38	18	32	20	-9
Facades	42		28	10	-19

Source: Viljakainen 2009

sions. In comparisons of building structures based on the environmental product declarations drawn up by manufacturers of building materials, the carbon dioxide emissions (mainly fossil-based) of concrete or brick external walls are more than 90 kilos per square metre. The manufacture of a corresponding wooden external wall would store more than 10 kilos of carbon dioxide from the atmosphere. Comparisons with other construction units produce similar results (Table 1). Reducing emissions through choice of building materials is clearly cost-effective, as the costs of building components that are similar in terms of their properties do not differ greatly from each other.

In analysing the entire lifecycles of buildings, the role of building materials in total energy use is small, however. The direct climate impact of heating would in fact appear to be a quicker way of influencing the climate than the choice of building materials. In Finland, the scope for increasing the use wood chips is considerable. In 2007, wood chips accounted for only 1.3% of all energy use, but the target set in the National Forest Programme is to achieve at least a tripling of the use of chips by 2015. Depending on the type of fuel that wood chips replace in generating heating, the amount of fossil-fuel based carbon dioxide emissions is likely to fall by 3.3–6.4 mill. tonnes, or 4.2–8.1% on the 2007 level.

Compared with heat generation, wood processing for use as a transport fuel is efficient only if the amount of energy used in producing such fuel is low. The second-generation transport biofuels under development will allow a reduction in greenhouse gas emissions by as much as 85% compared with fossil fuels. The realisation of this would, however, require a lot in terms of raw material availability and opportunities for utilising the waste heat from the biofuels manufacturing process. Competition in manufacturing transport fuels is global, however, as they can in principle be produced from any plant material. In this competitive arena, Finland's forests are not the most efficient producers of biomass. Their advantage lies in their extensive coverage and in the complementary forms of use of the forests. What is more, Finland's forests do not compete for land resources with food production.

Forests and Wood Products in Global Climate Policy

The climate treaty negotiations under way also concern wood products and forests. It is very unlikely that wood products will be included in the emissions trading that starts in 2013. Nevertheless, the reporting obligation on the carbon stored in wood products will probably be expanded. This will require agreement on the calculation methods.

The first problem of principle is whether the extent of carbon sinks in forests and wood products should be compared against some base period or whether it is enough that the annual changes are monitored. If sinks are always compared against some past base period, this would encourage sinks to be maintained at higher levels all the time and penalise levels below the limit. This could be a problem in terms of forest use if the sink in a certain year was to fall temporarily. Furthermore, it is evidently impossible to define a base year that would be fair to all parties. The alternative is to calculate the sinks on an annual basis. This straightforward calculation method would be beneficial to a country such as Finland, as it would allow the harmonisation of the goals regarding different forest uses with the goals of climate policy.

A greater problem of principle is to determine how forest sinks would be included in setting emission reduction obligations. As Finland's forests currently sequester almost half of the country's anthropogenic emissions, other countries would not wish to grant Finland such a windfall advantage in emissions calculations. In the current treaty period there has been no climate policy parameter as an incentive for increasing sinks. In the case of the carbon sink of Finland's forests, it has only been possible to include a fixed amount of 0.6 mill. tonnes annually in the calculations. This is why it is important that a relative ceiling figure be approved for the post-Kyoto period, which would change in accordance with the sink achieved.

For wood products, there is an interesting debate on whether the carbon stored within them should be calculated towards the carbon balance sheet of the tree growers or of the product users. In addition, it would be natural from the climate change viewpoint to calculate only net atmospheric emissions for the forests and wood products. However, as this is, in practical terms, impossible, there have been two basic options proposed: models based on either the production of wood products or the change in stocks within national borders.

In the production model, all wood products would be included, even those exported from the country. In this model, a net exporter like Finland could include in its carbon store all the wood it produces, regardless of the country in which the wood is located during its different lifecycle stages. This model would open up new opportunities for wood product exports, as the international construction market would be unlimited for a sawmill-

ing industry the size of that found in Finland. On the other hand, the model would not give countries any climate policy incentive to buy Finnish wood products. Technically, the calculation basis would be difficult to implement, but not completely impossible.

By contrast, the stock change model would allow each country to calculate the change in the carbon store within its own national borders for its own benefit. Under the current practice, whereby non-fossil carbon transferred over national borders is not directly covered by emissions trading, the stock change model would favour an increase in the long-term use of wood domestically. Countries importing forest products could include their purchases in their own carbon balance sheet. If this carbon store were one day to be included in emission trading, this would be an incentive for increasing wood use everywhere.

The climate negotiations under way will determine solutions affecting the use of wood, but without economic penalties their effect may be small. In the future, the indirect advantage of deducting the sink of forests and wood products from other emissions would continue to fall outside the forest sector. The solutions presented above can be examined independently of each other, but emissions trading, forest use and wood products must be viewed in their entirety. If non-fossil carbon storage in wood products is to be credited, it would be natural to extend the same incentives and penalties to the entire lifecycle of wood products, from the use of land

right through to combustion. The end result would be very hard to predict and both the advantages and disadvantages would be split unevenly among the parties concerned.

Sources:

- Bioenergia maa- ja metsätaloudessa Working group on bioenergy production, Ministry of Agriculture and Forestry, 2008.
Ministry of Agriculture and Forestry. Memorandum. Helsinki. (In Finnish)
- Energy Statistics. Yearbook 2008. 2009. Statistics Finland.
Finnish Statistical Yearbook of Forestry 2008. Finnish Forest Research Institute.
- Kansallinen metsäohjelma 2015 – toteutuminen 2007–2008. 2009. Ministry of Agriculture and Forestry publications 3/2009. (In Finnish)
- Pingoud, K. & Perälä, A-L. 2000. Arvioita puurakentamisen kasvihuonevaikutuksista. VTT Technical Research Centre of Finland, publications 840. VTT. Espoo. (In Finnish)
- Pingoud, K., Perälä A-L., Soimakallio, S. & Pussinen, A. 2003. Greenhouse gas impacts of harvested wood products. VTT research notes 2189. VTT Espoo.
- Taverna, R., Hofer, P., Kaufmann, E. & Thuring, E. 2007. The CO2 Effects of the Swiss Forestry and Timber Industry. Scenarios of future potential for climate-change mitigation. Environmental studies No. 0739. Federal Office of the Environment. Bern. 102 p.
- Upton B., Miner R., Spinney M. & Heath, L. S. 2008. The greenhouse gas and energy impacts of using wood instead of alternatives in residential construction in the United States. Biomass and Bioenergy 32(1): 1-10.
- Viljakainen, M. 2009. Rakennustuotteiden valmistuksen ja rakentamisen aiheuttamista ympäristöarasteista – riittävätkö uudet energiatehokkuusvaatimukset. Finnish Forest Industries Federation, 10.3.2009. (In Finnish)

Will the Growth in Forest Energy Use Continue?

Antti Asikainen and Perttu Anttila

Use of Wood Chips from Forests has Increased Sharply Since 2000

Finland is committed to raising the proportion of renewable energy sources in its energy production. One of the key means is through increasing the use of 'forest chips', which are wood chips obtained from forests rather than sawmill chips. The National Forest Programme includes the target of increasing the use of forest chips to 8–12 mill. m³ by the year 2015. According to Finland's National Climate and Energy Strategy the use of forest chips should be increased to 12 mill. m³ by 2020.

Since 2000, the number of installations using forest chips has tripled to more than 420 (Figure 1). Most of these new installations are outside the forest industry, being mainly municipal district heating plants, although the number of combined heat and power plants has also increased. The use of forest chips has correspondingly grown steadily, apart from a dip in 2007 (Figure 2). About three quarters of the forest chips used in heat and power plants is from crown mass and stump wood from final cutting, and the rest is small-diameter trees from young stands. Almost all the small-diameter trees used by heat and power plants are whole trees, including branches, and only 10% comprises debranched stems. The chips for residential fuelwood comprise mainly small-diameter stems.

Reduction in Commercial Fellings is a Challenge for Increased Use of Forest Energy

The Finnish Forest Research Institute has calculated the forest chip potential for different raw material sources (Laitila et al. 2008). In principle, the potential would be easily sufficient to cover the targets for chip use, as the combined annual harvesting potential of crown mass and stump biomass from final cutting and energy wood from young stands is approximately 16 mill. m³. It is estimated that final cutting could generate an annual 6.5 mill. m³ of softwood crown mass and 2.5 mill. m³ of spruce stump biomass. Most of the crown mass would be from spruce. The estimate of potential assumes that commercial fellings remain at almost 55 mill. m³.

Final cutting in spruce stands is therefore in a key position in this regard. The forests' spruce reserves have been in full use, and fellings have decreased in the past few years. As it is likely that sawnwood production will remain below the level seen in the early years of this decade for some time yet, this will also be the case for fellings of spruce sawlogs, and so there will inevitably be less crown mass and stump biomass as by-products. The supply of fuel for forest chip users is also hampered

by the often wide annual variation in fellings of commercial roundwood.

Ways of Increasing Forest Energy Use

The impact of fluctuations in the economy on the availability of forest chips can be reduced by increasing the supply of chips from young stands. When small-diameter trees are the principal product of a felling, then the felling can be carried out independently of the forest industry's roundwood consumption. According to figures from the Finnish Forest Research Institute, the energy wood harvesting potential from advanced seedling stands and young thinning stands is 6–7 mill. m³.

The forest industry's need for pulpwood has also declined – probably on a permanent basis. The industry's capacity cuts in 2007–2009 have resulted in 9 mill. m³ of wood being 'liberated' for other uses. With the energy industry's ability to purchase roundwood improving at the same time, and with insufficient amounts of combustible peat being available, some of the wood meeting the dimensional and quality requirements for industrial wood has already been directed for energy production.

In June 2009, the average price of forest chips was already at a level of EUR 18.8/MWh, which corresponds to a factory price of about EUR 37.6/m³. The average price includes chips from felling residues, from stumps and from small-diameter trees. Chips from small-diameter trees are better in quality and also more expensive than other forest chips, and so the average price is likely to be around EUR 40/m³ already. Adding together the average costs of harvesting (EUR 12.9/m³), transportation (EUR 8.6/m³), chipping (EUR 7.0/m³) and organising procurement (EUR 1/m³) in the case of the industry's pine pulpwood results in a procurement cost of EUR 29.5/m³ (harvesting and transportation costs: Kariniemi 2009). It can be assumed that the transportation distance in the case of forest chips is shorter than for the industry's pulpwood, which would therefore reduce the costs for energy wood. In any event, there would appear to be a stumpage price for the energy use of small-diameter trees, even in the case of sites that remain outside the state subsidies.

Harvesting in young stands has also been limited by the high cost of harvesting, which has been partially compensated by subsidies. Chips from felling residues and stumps and, in today's market, from stems in traditional pulpwood stands, are even now competitive fuels, and they come to market without any production subsidies. Subsidies must therefore continue to be targeted at young stands that have almost no timber meeting the dimensional requirements for industrial wood.

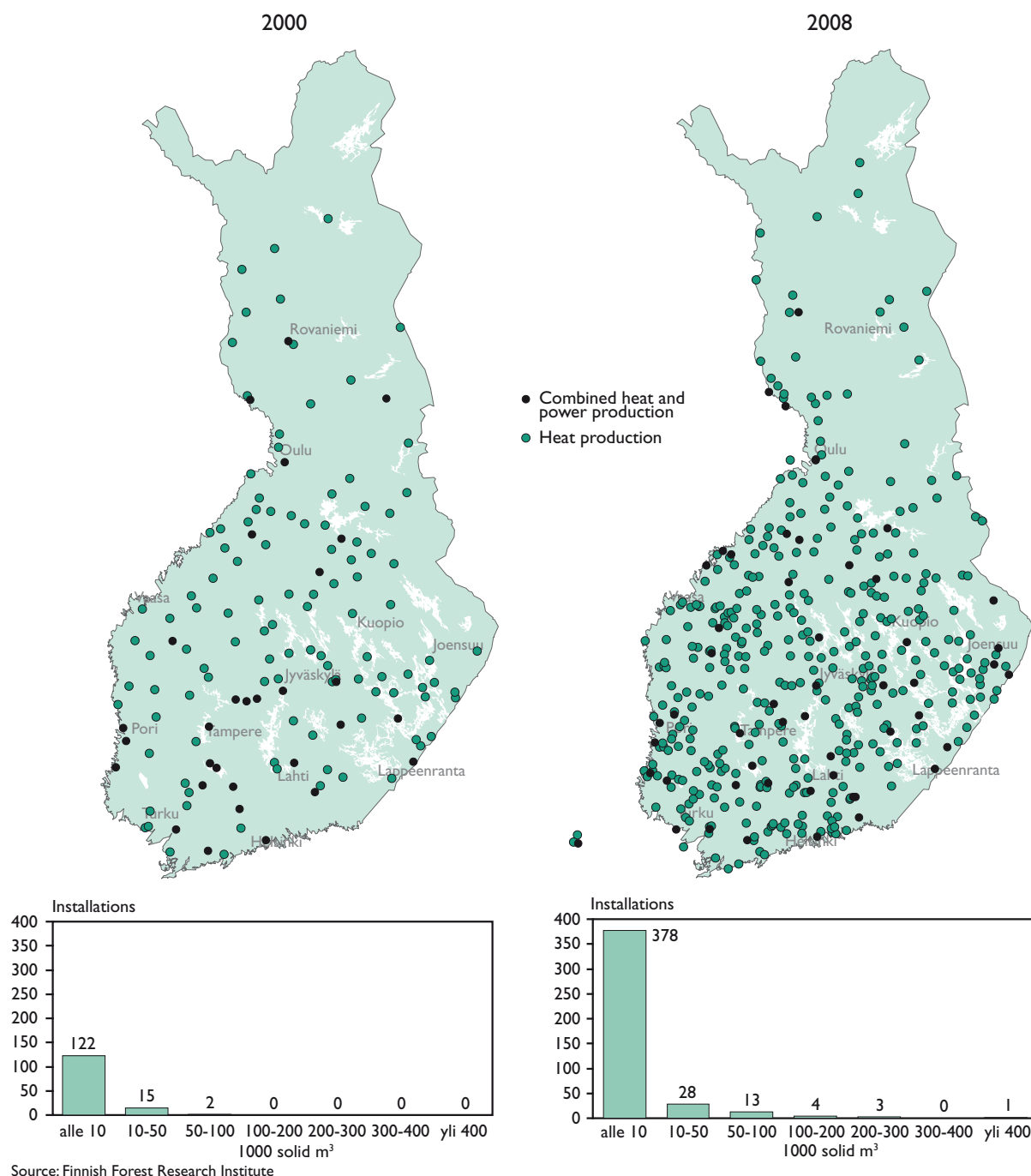


Figure 1. Heat and power plants using forest chips in 2000 and 2008, and by volume used.

Pulpwood Energy Use: Permanent Change or Temporary Phenomenon?

The energy use of forest chips has grown by about 450 000 solid m³ per year in the period 2000–2008. Two thirds of all the chips are from spruce-dominant final cutting and about one third from young thinning stands. The significant reduction in final cutting in 2008–2009 has directed energy wood procurement increasingly to young thinning stands and to first thinning stands. This

trend has also been hastened by the weakening demand and lower prices for pulpwood. At the same time, the willingness to purchase forest chips has improved considerably, in part as a consequence of the general rise in energy prices, and in part due to the poor availability of peat.

With the industry still having abundant pulpwood stocks, and there being a shortage of solid wood fuel in energy production, there are good reasons why the direct energy use of pulpwood should be increasing.

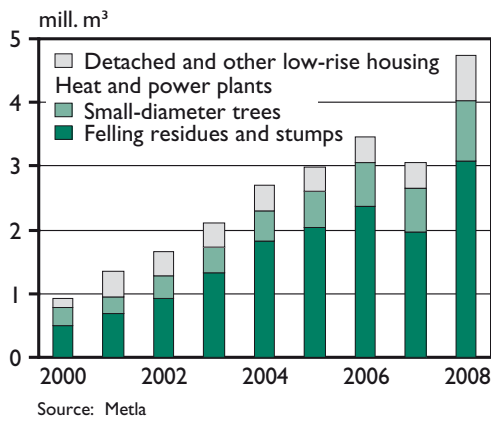


Figure 2. Use of forest chips since 2000.

Over the coming year, the energy use of wood will grow, making up for the drop in demand for industrial wood and providing business for companies in the procurement chain, and thus work for their employees and machinery.

There is also good reason to assume that the energy use of forest chips will continue growing in the future. Many factors driving energy policy and forest policy will steer the trend in this direction. Globally, it looks

like the southern hemisphere will increase in significance as a pulpwood producer, whereas in Europe there will be a greater political and economic focus on energy production. This greater focus on energy will also be reflected in Finland's forest uses and the future of the forests, whether or not energy is derived directly from the forests or via the by-products of the processing industry.

Sources:

- Finland's National Forest Programme 2015. 2008. Ministry of Agriculture and Forestry. Publications No 3b/2008. 50 p.
- Kariniemi, A. 2009. Puunkorjuu ja puutavaran autokuljetus vuonna 2008. Metsäteho results: slide series 13a/2009. 31 p. www.metsateho.fi/uploads/Tuloskalvosarja_2009_13a_Puuhuoltotilasto_aka_1.pdf (In Finnish)
- Laitila, J., Asikainen, A. & Anttila, P. 2008. Energiapuuvarat. In: Kuusinen, M. & Ilvesniemi, H. (eds). Energiapuun korjuun ympäristövaikutukset. Publications of Tapio and METLA. www.metsavastaa.net/energiapuu/raportti (In Finnish)
- Pitkän aikavälin ilmasto- ja energiastrategia. Government report to Parliament of 6 November 2008. 130 p. www.tem.fi/files/20585/Selontekoehdotus_311008.pdf (In Finnish)
- Polttoaineiden hintataso. 2009. Bioenergia 4/2009. (In Finnish)
- Torvelainen, J. 2009. Pientalojen polttopuun käyttö 2007/2008. Metsätilastotiedote 26/2009. 4 p. www.metla.fi/metinfo/tilasto/julkaisut/ (In Finnish)
- Ylitalo, E. 2009. Puun energiakäyttö 2008. Metsätilastotiedote 15/2009. 7 p. www.metla.fi/metinfo/tilasto/julkaisut/ (In Finnish)