



Featured Topics

Information Technology and the Structural Change in the Paper Market

Lauri Hetemäki

For as long as printing papers (i.e. newsprint, magazine paper, office papers) have been manufactured and used for communication purposes, their consumption has grown. Moreover, the initial concerns about printing papers being marginalized by information technology appear to have been unfounded. However, recent research seems to indicate that the situation is now changing (Hetemäki 2005, Hetemäki and Obersteiner 2001, Kurikka 2005). According to these studies, the mutually supportive development of information and communication technology (ICT) and printing papers is taking on a different shape. Figures show that paper consumption is either on the wane or on the rise, depending on the end use of the paper and the geographical location of the market examined. So what is actually happening?

Newsprint Consumption Declining in OECD Countries

The statistics in many OECD countries indicate that printed newspapers are read by an ever decreasing section of the population. Young people, in particular, are not reading them, and, contrary to earlier practice, are not reading them when they get older either. This is a key factor behind the reduction in newsprint consumption in, for instance, the United States, Canada, the Nordic countries and the Netherlands (Figure 1). There are other factors, of course, such as the reduced

unit weight of newsprint and the changeover from broadsheets to the smaller tabloid sizes.

In Japan, the world's second biggest newsprint consumer after the United States, newsprint consumption has also failed to increase since the early 1990s. Japan's newsprint consumption has in fact stabilised at nearly 4 mill. tonnes p.a. This is chiefly the result of the country's prolonged economic recession and the development of ICT, though the extent to which each of these has affected the situation is difficult to assess. Newspaper circulation, for example, has been falling at about 2% p.a. in the period 1998–2003, but at the same time the economy has been growing at an average of only 0.4% p.a. (real GDP growth).

The relationship between economic growth, population growth and newsprint consumption in these OECD countries has changed, and this can be seen as a historic structural shift. Since the early days of newsprint production, demand for it has grown continually, as economies and populations have expanded. This does not necessarily hold true any longer, at least in the countries mentioned. The changes that are taking place also suggest that the situation should be analysed in regard to both *the short and the long term*. Research shows that growth in the economy can have two quite opposite effects, depending on the time horizon examined (Hetemäki 2005, Hetemäki and Mikkola 2005).

Hetemäki and Mikkola (2005) demonstrate that in models which explain US newsprint consumption

on the basis of GDP growth, among other factors, the effects of GDP growth on newsprint consumption are positive in the short term but negative in the long term. However, a precise division between short term and long term is difficult, as this is related to time series econometrics and the specific models used. Nevertheless, the short term can intuitively be perceived as reflecting cyclical fluctuations, such as the transition from downturn to upswing. The long term, on the other hand, depicts a period during which structural changes can occur in the economy and in newsprint consumption, i.e. a period that is considerably longer than cyclical fluctuations.

Research shows that cyclical changes in the economy have an effect on newsprint consumption, which confirms conventional wisdom: when the economy improves, advertising in newspapers and other media will increase and so newsprint consumption goes up, and vice versa in a cyclical downturn. This being the case, we should still see periods in the OECD countries when newsprint consumption will grow again and prices rise. The situation looks different, however, if short-term cyclical fluctuations are removed from the statistics on newsprint consumption and the economy, and attention given instead to long-term trends. In the longer term, economic growth will encourage the tran-

sition to an 'information society', where computers, the Internet, broadband connections, etc. are accessible by an increasing number of people. In other words, the wealthier the country, the more likely that people will be able to acquire and use electronic media. This, in turn, will allow people to replace printed newspapers ever more easily with digital information technology, such as on-line editions of newspapers. In some cases, reading newspapers, whether printed or on-line, may be given up completely and the time spent instead on other opportunities offered by new media and digital products and services (e.g. video games, Internet surfing, various multimedia devices). With only 24 hours in a day, the different communications channels and forms of entertainment are all competing for the consumer's time in a zero-sum game.

Office Paper Follows Newsprint Trend but with a Time Lag

Besides newsprint, the market for certain office papers (e.g. business forms) has also experienced a structural change in recent years as a result of ICT development. Commercial banks, for instance, have switched from printed bank statements and forms to on-line versions. This has often been motivated by both economic

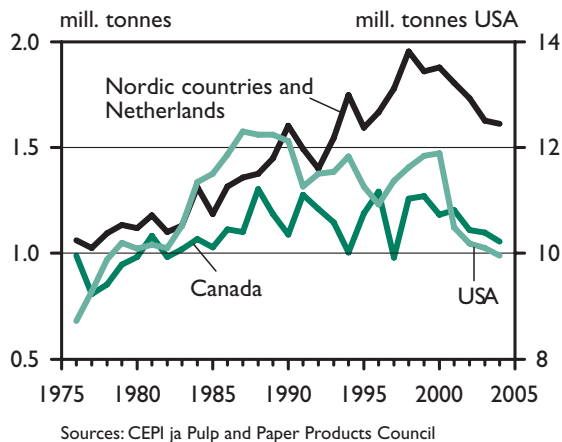


Figure 1. Newsprint consumption in selected OECD countries, 1976–2004

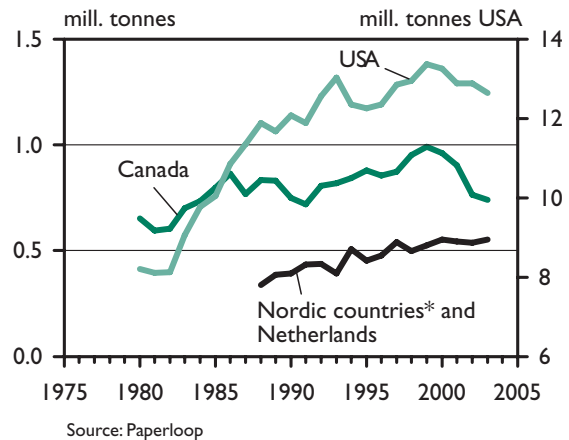


Figure 2. Office paper (uncoated woodfree) consumption in selected OECD countries, 1980–2003

and environmental considerations. In spring 2005, for example, the Bank of America announced its new policy on paper use, declaring that it aims to minimise the use of paper through measures such as increasing the amount of electronic communication (Bank of America 2005). The introduction of this policy follows pressure from environmental groups and is also based on the Bank's own economic considerations. Similar guidelines have been issued by many other companies in the United States and Europe (e.g. Citygroup and HVB Group). The banking and insurance sector is one of the biggest consumers of business forms, and so the policies adopted on paper use will inevitably affect the total consumption of office papers.

In many countries, the public sector has also adopted the goal of reducing paper consumption. Typical examples are the aims expressed by central and local government administrations and universities about changing over to electronic documents. In Finland, one of the most recent examples is Tampere City Council's aim of switching to the use of electronic documents in the business of the council (City of Tampere Environmental Strategy 2005–2012).

Published statistics reveal that in many OECD countries (Figure 2 and Hetemäki 2005, Kurikka 2005) the growth in consumption of office papers (e.g. A4 and business forms) has either slowed significantly, come to a halt or started to decline. The developments described earlier are most likely a key factor in this. Facilitating and reinforcing this trend is the development of digital information technology. In Japan, the figures show that the consumption of office paper is following this pattern, as consumption has remained at approximately 3.5 mill. tonnes p.a. in the past ten years. As with newsprint, it is difficult to estimate the extent to which the weakening of growth in office paper consumption is caused by the economic recession and by the development of ICT.

It is interesting to observe that the structural change seen in newsprint and office papers has not yet occurred in magazine paper. Consumption of magazine paper in the OECD countries, including the United States, has continued to grow, albeit at a slightly slower pace than before. This confirms the difficulty in making generalisations in assessing the effects of ICT on paper products, as the impact of ICT differs according to the

paper product in question. For example, in the OECD countries the outlook is good for paper grades suitable for printing photographs, and information technology is the very reason for this.

Assessments of Paper Consumption in OECD Countries Need Updating

Assessments of the outlook for the consumption of paper products are made at regular intervals by consultancy firms serving the paper industry and by the UN's Food and Agricultural Organisation (FAO) and various research institutions. Studies of these assessments (see Sources list) indicate that in most of them either the structural change described above has not been taken into consideration at all or the impact of ICT has not been adequately accounted for. Assessments of paper consumption in the OECD countries in the longer term made on this basis do not, therefore, appear realistic. In the case of some assessments, this can already be seen in recent developments. New assessments that take into account the impact of ICT on paper consumption are essential, though this will be a challenge to researchers because it requires the development of completely new forecasting models (see Hetemäki 2005).

ICT development affects not only the consumption of paper products but their *prices* as well. The increasing application of ICT in the paper industry has also led to an increase in productivity, and this trend will continue. At the same time, the competition between printed and electronic communications is increasing, and price trends on the world paper market are also converging as ICT development continues. All these trends will intensify competition on the paper market and create pressure for lower paper prices.

New Geographical Focus Emerging in Paper Production and Consumption

Overall, the consumption of paper products will continue to increase in the world at large, regardless of developments in ICT. Although the traditional links between paper consumption, economic growth and population growth seem now to have been broken in a number of Western countries, this is not the case yet in, for example, China or Russia. The effects of ICT

on paper products are, in principle, the same everywhere, but other factors guiding paper consumption are more prominent in these regions. In India, China and Russia, for example, consumption of newsprint and office paper per capita is only a fraction of what it is in the previously mentioned OECD countries. With greater economic prosperity, the consumption of paper will probably grow in these countries at least in the coming decade.

The development of ICT will reinforce the structural change already under way on the world paper market. Paper product consumption in the OECD countries will either increase slowly or not at all, in contrast to many Asian countries, Russia and the countries of Eastern Europe, where it will increase rapidly; these countries also have significantly lower paper industry production costs than the OECD countries. Production trends will be influenced not only by labour costs, but also by the availability and price of raw materials. All this will inevitably mean that the focus of paper consumption and production will increasingly move away from the OECD countries. This is likely to occur gradually and over the longer term.

In general, many of the structural changes brought by information technology will occur at a slow but steady rate over many years. Such changes are often easier to manage and prepare for. However, a potential problem is that slowly occurring trends do not always provoke a response, and preparing for such changes may be delayed because of more pressing issues, with the result that the response may occur too late. Hence, it is particularly important that traditional paper producing countries such as Finland should prepare for

the paper market changes referred to here, as they are already looming on the horizon. One way of doing this is to increase the amount of research, information and debate on the effects of information technology and the new opportunities that it brings. Although the latter has not been presented here, it is clear that making good use of these opportunities will probably be a key factor in responding to the structural changes on the world paper market.

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Roundwood Markets and Price Changes in the Baltic Sea Region

Anne Toppinen and Jari Viitanen

Considerable changes have taken place in the operating environment of the forest sector in Estonia, Latvia and Lithuania since the early 1990s. Their forests have been privatised, and fellings, wood raw-material use and foreign trade have all increased substantially. In addition, all three countries became members of the European Union in May 2004. The rapid international integration of Estonia, Latvia and Lithuania and the international nature of roundwood procurement by the major forest industry corporations have been key factors in unifying national roundwood markets throughout the entire Baltic Sea region.

In 2003, a total of about 30 mill. m³ (without bark) of roundwood was imported to the countries of the Baltic Sea region, according to figures from the UN's Food and Agricultural Organisation (FAO). Together, Finland and Sweden account for over 80% of this total. Although four fifths of Finland's and one fifth of Sweden's roundwood imports are from Russia, roundwood trade among the countries of the Baltic Sea region has more than doubled during the past ten years. Estonia, Latvia and Lithuania account for more than half of this trade, and in 2003 their combined roundwood and chip exports totalled more than 12 mill. m³.

The overall import and export figures do include significant differences from one roundwood category to the next, however. In Estonia, Latvia and Lithuania, for example, the lack of pulp and paper industry processing capacity means that domestic demand for pulpwood is low, and so pulpwood is exported, mainly to Sweden and Germany, which is also the case for wood chips produced as a bi-product in sawmilling. In contrast, sawmilling industry capacity in these countries has expanded considerably. With only limited sawlog reserves, fellings have exceeded the annual

growth, and domestic roundwood supply has not been able to meet the growing demand, particularly in Estonia. Almost one third of Estonia's sawlogs in recent years have been imported, mainly from Russia.

National Roundwood Prices Converging

As roundwood consumption has grown and roundwood trade increased among the countries of the Baltic Sea region, national prices for the different roundwood categories have been converging in recent years. Figure 1 presents the monthly nominal roadside prices (EUR/m³ with bark) for categories of softwood roundwood in Finland, Estonia and Lithuania since 1996. Directly comparable price statistics are not available in Sweden, Germany or Latvia, but Sweden's quarterly statistics are illustrated separately in Figure 2. Although roundwood prices in Finland have been higher than in Estonia, Latvia and Lithuania, the prices in each roundwood category have gradually converged. Whereas the Finnish price level has remained fairly stable during the past ten years, prices in Estonia and Lithuania have risen substantially, and national prices for different categories of softwood roundwood have been converging. For pulpwood grades, Estonian prices have even exceeded the Finnish price level during 2005. In trend in real prices between the different countries has been more balanced than nominal prices, due to the higher inflation in Estonia, Latvia and Lithuania than in Finland.

Research shows that Finland has been the price leader on the Baltic Sea region roundwood market. Prices in Estonia and Lithuania, which are very similar in their geographical and other circumstances, have followed each other more closely, however, than between

Finland and Sweden or Finland and Estonia. Interesting differences can be observed in the convergence occurring in the markets for the different roundwood categories. National prices for spruce sawlogs have been most closely linked of all, and on the pulpwood markets the difference between Finland and Estonia, Latvia and Lithuania has shown a diminishing trend. The fact that the clearest link is between the spruce sawlog markets is somewhat surprising, because there is greater fluctuation in short-term prices for sawlogs than for pulpwood, mainly due to quality differences. This may, however, simply illustrate tougher competition in sawlog markets and stronger transmission of demand effects to the roundwood market in the case of sawnwood than paper products.

Storm Damage Impact Evident in Prices in Sweden, Estonia, Latvia and Lithuania

The practical implications of the convergence in roundwood prices are seen in the increasing similarity of national prices levels and the faster transmission of supply and demand shocks from one country to the other. The January 2005 storms felled about 75 mill. m³ of forest in Southern Sweden and almost 10 mill. m³ of forest in Estonia, Latvia and Lithuania, mostly large-sized spruce. The storms created a sudden increase in the supply of spruce sawlogs and spruce pulpwood, in particular, and forced prices down in some parts of Sweden by over 40%.

Figures 1 and 2 illustrate how quickly this sudden supply shock translated into lower prices in the Estonian, Lithuanian and Swedish sawlog markets. The impact on the Finnish roundwood market was significantly less, because the amount of storm-damage roundwood imported from Sweden was relatively low. However, the increase in supply caused by the storm damage has been indirectly reflected in the Finnish market during 2005 in the form of a considerable increase in imports of spruce sawlogs and softwood pulpwood from Estonia, Latvia, Lithuania and Russia as a result of Sweden's reduction in roundwood imports. This was accompanied by a slight drop in import prices of softwood sawlogs in Finland.

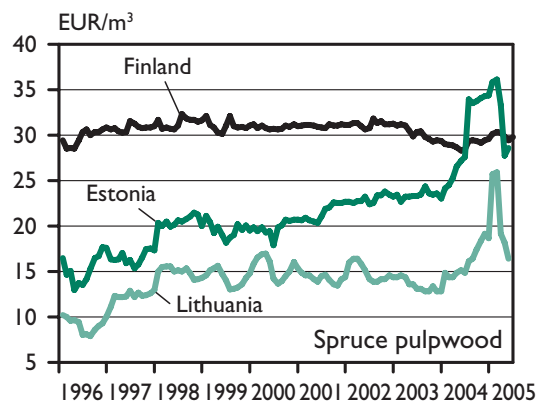
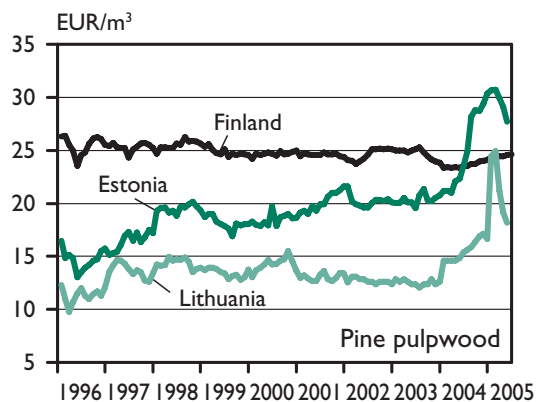
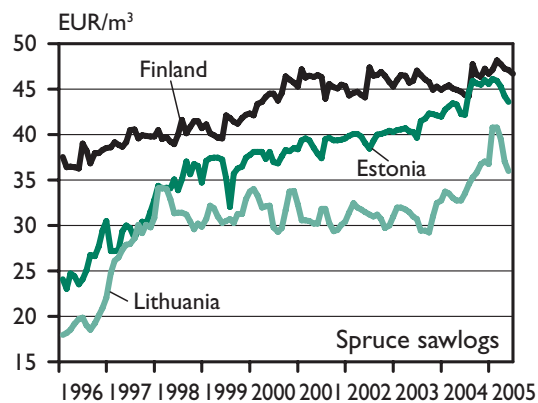
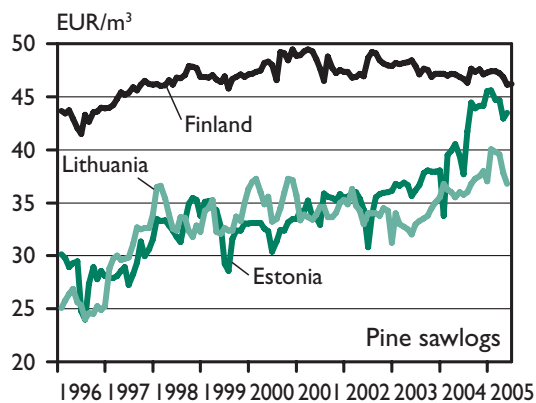
Future of the Roundwood Market in the Baltic Sea Region

Roundwood trade and prices in the Baltic Sea region are particularly affected by developments in Russia's forest industry and the world market demand for forest industry products. There are nevertheless clear differences in the outlook for each of the roundwood categories. Competition for high-quality sawlogs will increase as a result of the forest industry investments planned for Northwest Russia and the Baltic Sea region, Russia's possible export restrictions on its roundwood and the end of the forest taxation transition period in Finland. Even if the demand for pulpwood were to increase too, the supply of wood chips used as a substitute for pulpwood will grow considerably in the future as a result of the sawmill investments already being made. The pulp industry's investment focus is also gradually shifting towards the southern hemisphere's plantation forests, which means there will no longer be the strong pressure for increases in pulpwood prices in the Baltic Sea region that was present in the 1990s, when pulp and paper capacity was clearly increasing.

The internationalisation of forest industry companies operating in the Baltic Sea region will continue and cost efficiency will become more important in their operations, which will lead to greater concentration in overall roundwood procurement. Together with moderate growth in roundwood demand, this means that further convergence in the national price levels within the Baltic Sea region can be expected in the future.

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Figures 1a–d. Roadside prices for roundwood in Finland, Estonia and Lithuania, I/1996–V/2005

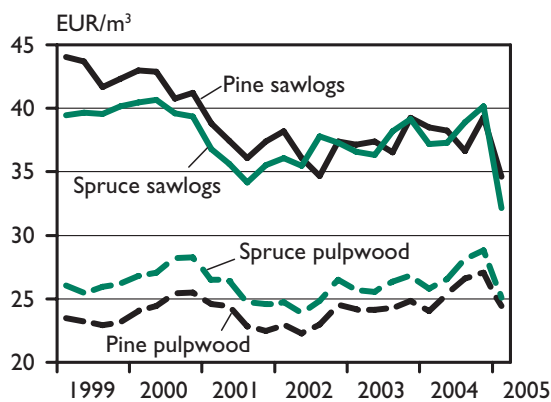


Figure 2. Roadside prices for roundwood in Sweden, 1999–2005

Source: Finnish Forest Research Institute

Changes and Challenges in the Russian Forest Sector

Timo Karjalainen, Antti Mutanen, Tatu Tornainen and Jari Viitanen

Forest Policy Being Redefined

Russia's forest policy has been in continual flux since the early 1990s. Although the concept of a forest policy did not exist in Soviet times, in practice such a policy was operated via the production plans, for example, and the emphasis was on judging the extent of felling that would satisfy the industry's roundwood needs. Today, forest policy is understood more broadly as a somewhat fragmented entity encompassing forest legislation, various target programmes, strategy documents and international agreements.

The Russian Federation's first forest legislation was passed in 1993, and subsequently reformed in 1997 (as the Russian Federation Forest Code) and again in 2004. Preparation of a new Forest Code is already under way, and this is proceeding in parallel with a reorganisation of the administrative apparatus. The principal aim of the new Forest Code is more efficient economic utilisation of the forests by promoting investment and encouraging long-term forest lease agreements.

The role of the private sector in the use and management of Russia's forest resources is to be significantly expanded. The period covered by long-term forest leases, which are a key component in the economic utilisation of the country's forests, has already been extended to 99 years. The lessee's responsibilities will be increased in regard to forest regeneration, management and thinning, and construction of forest roads. Set against this, lessees will also be given greater freedom to plan and to do business. As lessees, they will be required to pay for the right to utilise forest resources and for the roundwood harvested. In addition, short-term roundwood harvesting rights (without any silvicultural obligations) will be auctioned.

Decision-making authority on forest resources has been concentrated with the national authorities at federal level, at the expense of regional and local administrations. Regional forest legislation has been annulled and forestry funding matters have been transferred to the Federal Forestry Agency. Concentration at national level is aimed at ensuring common standards and practices in forest management and use throughout the country. In the preparatory work on the new Forest Code, the possibility of privatisation has also been given serious consideration but has been abandoned, at least for the time being.

The reform of the administrative apparatus is aimed at clearly separating the state's forest asset administration, monitoring and business functions. Set up in 2004, the Federal Forestry Agency together with its regional units represents the executive organ of the Government's forest administration and operates under the Ministry of Natural Resources. At local level, there exists the network of *leskhoz*s, or local forest management units. Although the practices of the *leskhoz*s have remained almost unchanged since the 1930s, their roundwood harvesting function was transferred in 1993 to the forest users themselves, i.e. those granted the right to utilise forest resources. This left the *leskhoz*s with the duties of silviculture, conservation and monitoring, and they have also been permitted to conduct thinnings, the sales income from which must be used for financing their administrative duties. The role of the *leskhoz*s as state forest administrators, leasing managers, business operators and monitoring authorities all rolled into one has been widely criticised. Monitoring has already been transferred to a separate federal service for nature utilisation control. A new organisation is being planned to replace the *leskhoz*s, and this

would be responsible at regional level for arranging silviculture and conservation.

Improvements in Forest Management and Roundwood Harvesting

Changes in forest management and roundwood harvesting are being made in response to pressures both from within Russia and from outside the country concerning the ecological, economic and social sustainability of forestry. From the viewpoint of commercial forest users, the main problem has been the short-term nature of the leases, which has not facilitated long-term planning of forestry work.

Russia's total surface area of forest classified for full commercial use has decreased over the years, whereas the area of forest classified for limited commercial use has increased. The forests are softwood-dominant, although the proportion of birch and aspen in the total volume of growing stock and in relation to the surface area has been increasing. The proportion of the forest classified as mature or over-mature is high, at about 55%.

The greatest problem in silviculture has been inadequate financing. An indication of the problems in successfully dealing with such issues is that treeless forest land accounts for about 12% of Russia's total surface area of forest. Thinnings have accounted for only a small proportion of all fellings, at just 13% of the felled area. A substantial increase in the amount of thinnings carried out at the appropriate growth stage is required if the composition and growth of forests is to be managed more effectively. Otherwise, the effects of thinnings on the growth of the remaining trees in older forests and especially in previously unthinned forests are very small. Thinnings have traditionally been carried out by the *leskhoz*s, because under the Forest Code they have not been permitted to perform any final cutting. With the spread of harvesting technology from the Nordic countries, logging enterprises (*leskpromhoz*s) have recently shown greater interest in carrying out thinnings. The amount of thinnings undertaken has so far remained fairly low, however, because of the lack of domestic demand, especially for small-diameter hardwood timber, and because of the higher costs of harvesting in thinnings stands by comparison with

final cutting. The abundance of final cutting undertaken and the minor amount of thinnings has led to extensive areas being used for roundwood procurement. This is increasing the need for road construction, raising the costs of harvesting and transportation, and affecting the profitability of roundwood production and harvesting. It is also leading to a decrease in the amount of economically accessible forest. This is despite there being an abundance of forested land close to good road connections, because much of this is subject to felling restrictions.

Only 22% of the annual allowable cut throughout the country was used in 2003. The same year, fellings amounted to 174 mill. m³, of which 72% was from final cutting. A lot has been said in public about illegal fellings, which are estimated to account for anywhere between 5% and 30% of total fellings, depending on the definition. The problem is acknowledged by the authorities, and the prevention of illegal fellings has become one of the key aims of the Federal Forestry Agency's work. It has already introduced a fellings monitoring system based on satellite and aerial images, and plans are being made for a forest transportation control system and monitoring arrangements for wood-processing companies.

More than 90% of the former state logging enterprises (*leskpromhoz*s) have been turned into limited liability companies. Most roundwood is harvested using traditional Russian methods. The Nordic cut-to-length harvesting method has become more widely known, and in the Republic of Karelia this is used in almost 50% of all fellings. The main problem in roundwood harvesting is the poor network of forest roads, and especially the lack of roads suitable for use all year round. Poor profitability means that companies are also unable to invest in new machinery. A further problem has been the difficulty in obtaining a trained and motivated labour force.

Russia's guidelines on forest management are currently being revised. It is important that these should take account of the need to improve the efficiency and profitability of roundwood production and forest management in the longer term, so that a given quantity of roundwood can be procured sustainably from a smaller area. This means focusing more attention and resources on the different stages of roundwood

production, beginning with the tending of seedling stands and thinnings, and going on to final cutting and forest regeneration. Increasing the proportion of fellings in areas accessible from the existing network of adequate roads would reduce pressure on more distant regions and would quickly improve the profitability of forestry.

Forest Sector Exports Based on Products with Low Added Value

Russia's forest sector exports since the end of the Soviet Union have been dominated by products with low added value. Roundwood exports from Russia almost quadrupled in 1992–2004, from approximately 10 mill. m³ (under bark) to over 40 mill. m³. Indeed, Russia has become the world's biggest roundwood exporter, and there has also been a revival in its sawnwood exports. Roundwood and sawnwood together accounted for 60% of Russia's forest industry exports by value in 2004. The Government's aim is actually to reduce this high proportion accounted for by forest industry raw materials and products with low added value. In political debate, demands are regularly voiced for raising the export duties on softwood roundwood, for example.

Developments in the production and consumption of forest industry products in Central and Eastern Europe have brought structural changes to the European market, and the return of Russia to Europe's sawnwood market has intensified competition and had a major influence on the fortunes and market shares of other producer countries. However, the success of more highly processed Russian forest industry products on the export market has been hampered by inefficient production and product quality problems due to outdated processing capacity.

If Russian domestic demand for roundwood were to increase significantly and restrictions were to be placed on roundwood exports, this would naturally reduce the proportion of roundwood in the country's forest sector exports. Russia's forest resources provide the country with a firm basis for transforming itself from its present position as low-cost raw materials supplier to being a significant exporter of highly processed forest industry products with considerable influence on the world

market. The realisation of such a goal will require not only political will but, above all, major investment in infrastructure, forestry and forest industry production capacity.

Forest Industry Investment Requires Foreign Capital

Russia aims to develop its domestic wood processing industry in order to increase exports of forest industry products with a higher added value than roundwood. It aims to establish strong new vertically integrated forest industry complexes. However, the country's forest sector still lacks the domestic or foreign capital to achieve this.

Domestic investment is hampered by the undeveloped nature of the banking sector, the difficulty in obtaining credit, and the general lack of interest in the forest sector among investors. Returns available in the forest sector are smaller than, for example, in the energy sector, which has attracted the bulk of investment. Foreign investment therefore has a potentially key role in the development of Russia's forest sector. Of interest to investors are the country's massive forest resources, the prospect of high consumption on the domestic market, and the low price of wood raw material and other production inputs. Factors deterring investors are the undeveloped infrastructure, lack of clarity on forest ownership rights and right of use, obligations related to forest use, logistics, cultural differences, bureaucracy, obligations to society that come with making investments, and the lack of general agreements protecting investments. However, the most serious of these factors in the case of pulp and paper industry investments is the uncertainty surrounding the continuity and reliability of roundwood procurement. If greater investment can be attracted, this will help provide jobs and livelihoods in many regions and communities in Russia.

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