



INDUFOR ...FOREST INTELLIGENCE

Despite the economic downturn in the past year, Indufor has managed to strengthen its presence in key regions of interest for timberland and forest industry investors. We can assist our clients in identifying opportunities, in improving profitability and in developing sound investment strategies.

Global changes are taking place in the forest industry: a change from north to south, and a change from “old” industrialised countries towards emerging economies, with their low-cost plantation wood. Also, new regions in the boreal zone – mainly in Russia – are gaining in importance. In Finland, structural changes in the forest industry have been accelerated by unfavourable productivity development compared to many other countries. These transformations will continue to drive the demand for our services.

In this newsletter, we focus on competitiveness factors of the Finnish forest industry, on our experiences in supporting investments in sustainable forest management, and on forest industry development in Russia and other emerging countries.

We at Indufor are fortunate that, despite the general economic downturn, strong demand for our services by international financing institutions and other public sector agencies has allowed us to retain and even increase our professional staff (please see page 6). A balanced portfolio of private and public clients, our coverage of the whole forest value-chain, and our range of forest products and services are strong assets for us.

As you may have noticed, we have updated our logo and slogan. This new look is based on a year-long internal process of spelling out our values and discussing our mission as a global provider of advisory services. We have also revised our website to include more detailed descriptions of our staff’s areas of expertise and of the services offered by Indufor. Please take a look at www.indufor.fi.

I hope you enjoy the articles!

Tapani Oksanen
Managing Director
Indufor



THE COMPETITIVENESS OF THE FINNISH FOREST INDUSTRY

Unfavourable productivity development in the forest industry is an underlying cause of the crisis the Finnish forest sector is facing. Overall industrial productivity growth has been inferior to that of traditional competitors, and producers in many emerging markets have gained a competitive advantage. There is an urgent need to reshape the whole Finnish forest value chain, from trees to final products, to better respond to these challenges.

A productivity increase in various industries is the main driver of long-term economic growth. It is also a good indicator of competitiveness. An increase in productivity entails a more efficient and valuable use of raw materials and other inputs, an application of new technologies and, particularly, new innovations.

Since its founding in 1980, Indufor has annually measured the productivity of the forest industries in Finland as well as the productivity of its main competitors: Sweden, France, Germany, Austria, Canada, the United States and Japan. Productivity development has been calculated separately for the sawmill industry and the pulp and paper industry. (In Finland, productivity levels of the overall wood products industry have also been measured.)

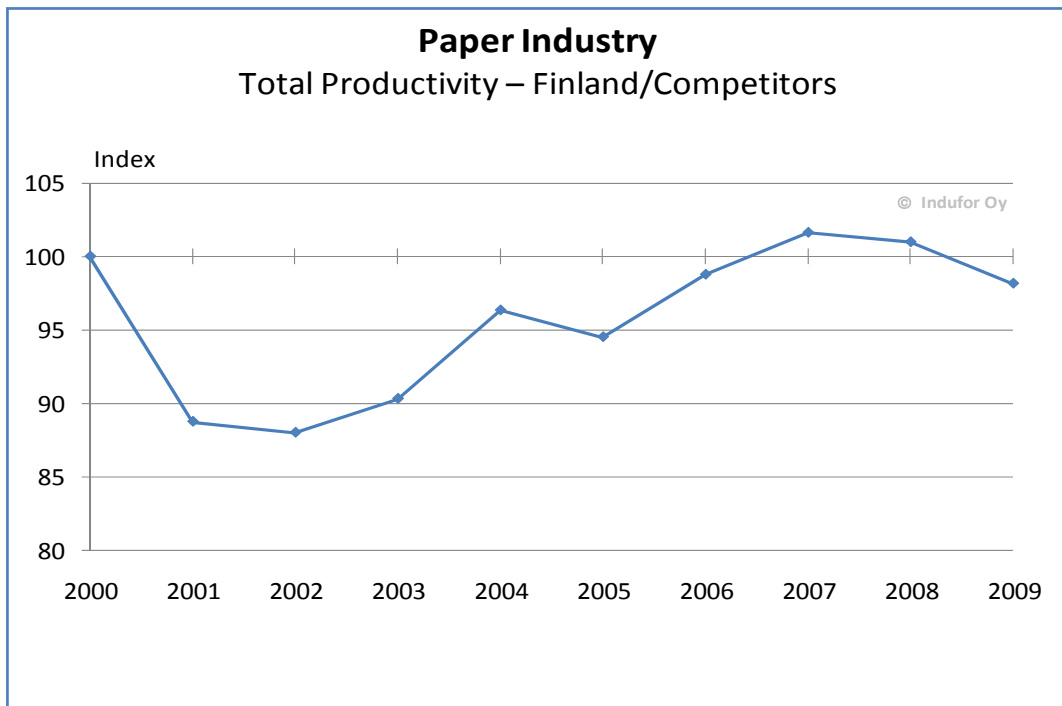
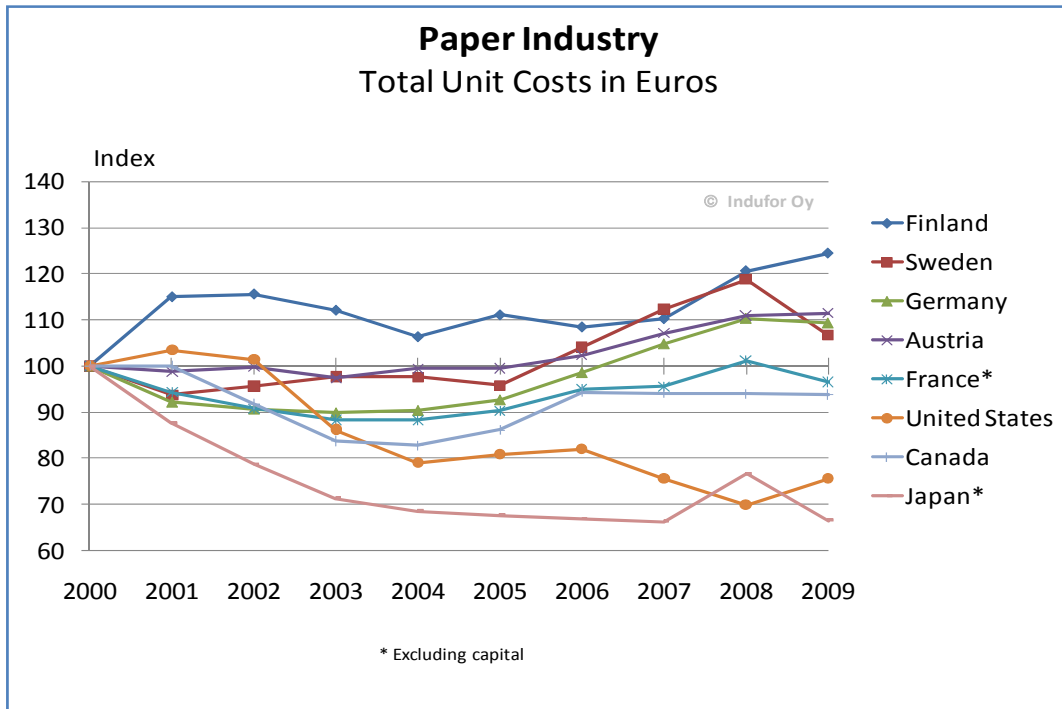
Productivity is measured as the output per one unit of input. Statistical data collected to measure productivity consists of volumes, unit prices, and values of output/input categories. Input is divided into raw materials, labour, chemicals, energy, capital and other inputs. Development of the productivity is measured relative to a base year (2000=100). In addition to productivity, Indufor has tracked the development of unit costs and indicators of competitiveness in the forest industry sector.

Current situation

Production in the Finnish sawmill industry has decreased by 30% during the first half of 2009, compared with the first half of 2008. In the pulp and paper industry the volume reduction has been 28%. Although this trend has been global, the decrease in Finland has been drastic.

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Although the decreases in Finnish paper and wood processing industries' production have been similar in magnitude, the two sectors are facing different challenges. While the pulp and paper sector is undergoing a major structural change, with the survival of the industry in Finland under question, the downturn in the sawmill industry is more cyclical in nature and is driven by the recent reduction in European construction activity.

Reasons behind the structural change in the pulp and paper industry are manifold. Most importantly, the development of unit costs in 2000-2009 in the Finnish pulp and paper industry has been disadvantageous relative to other countries selling pulp and paper products in the European markets. This has been caused by a combination of increased input prices (especially energy and labour) and weakening productivity.



Decreasing production has accelerated the downturn in productivity during the last couple of years (see the graphs on the previous page). The main reasons for the decrease in productivity and loss of competitiveness are:

- Temporary plant shutdowns and the inelasticity of some inputs, e.g. labour, which are yet to be adjusted to the current level of production.
- Exchange rates and the strength of the Euro.
- Structural differences of competing countries with regard to product mix and raw material mix.
- Logistics costs and the increasing of production closer to the markets.

Future prospects

In the short term, opportunities to directly influence unit costs and productivity of the sector in Finland are minimal. In addition to capacity closures, the industry can attempt to decrease key input prices (e.g. energy, labour and wood). However, the ability to reduce these costs is somewhat limited.

In the long term, the Finnish forest sector will require fundamental structural changes in forest production and producer organisations, as well as in the forest industries. The sector's future will be increasingly driven by demand for wood products, bioenergy and new products based on forest fibre resources, instead of by stagnating demand of pulp and paper. This change has been partly acknowledged as increasing efforts have been channelled to the sector's R&D. However, retaining a competitive domestic operating environment is equally important to bear in mind when decisions on the production locations for these new products are being made.

*Petteri Nuolivirta
Forest Industry and Bioenergy Specialist*

INVESTING IN TIMBERLAND AND WOOD PROCESSING IN EMERGING MARKETS

While forestry investments in Russia are driven by the industrial companies' need for securing wood supply (see the following case study), in many other emerging countries (such as Brazil, Uruguay, and Malaysia), timberland investment can be quite lucrative. In these countries, investments are commonly made by investors who specialise in timberland.

Investing in timberland differs markedly from investing in wood processing. The time frames are different, the value increase of the respective investment is based on different factors, and the management of a manufac-

turing facility differs greatly from the management of timberland. This is why investors in the U.S. first began to view timberland investments as separate from forest industry investments. This trend continues today in other regions of the world, so timberland investors are often hesitant to link wood processing with timberland investments.



Khabarovsk, Russia (Photo Ilkka Norjamäki)

However, on some occasions an investment in processing is either a necessity or can improve the value of the forest investment. A processing investment should be considered if:

- There is no market for some of the wood assortments (such as pulpwood), or much higher returns could be achieved, if some of the wood is sold in a processed form (e.g. as chips rather than pulpwood).
- There are export duties on roundwood, but not on processed products.
- An industrial investment is required by the state as a pre-condition for acquiring a concession.
- A forest asset is sold with an existing processing plant as an integral part of the deal.

Indufor can assist forest land investors who are considering industrial investments jointly with a forest land investment. We can help in analysing the following issues:

- Will the investment in wood processing add value to the timberland investment by increasing the market value of some of the wood assortments or by increasing the sales value of the asset at exit?
- Is the internal rate of return on the processing plant attractive enough to justify the investment?

The complexity of a wood products business may come as a surprise to a forestland investor, and there is a temptation to take shortcuts in the planning. Many equipment manufacturers are eager to sell their equipment whether or not it really fits the raw material or can efficiently produce products with market demand. With insufficient planning, the value of the wood may



RUSSIAN FOREST & INDUSTRY INVESTMENT – CASE STUDY

Russian forest policy encourages large investments in the sector. The political aim is to add value to the wood domestically and create local jobs.

Investments in forest leases in Russia are often not attractive on their own, but returns can be improved by adding wood processing to the investment. On the other hand, a large processing investment is typically not realistic without a forest lease that ensures raw material supply to the mill. The logic in timberland investments in Russia is therefore different from other emerging forestry regions.

The low returns of Russian timberland investments are due to factors such as the remoteness of the available lease areas, the lack of roads and other infrastructure within the lease areas, limited logging seasons, and the cumbersome forest management regulations that make efficient and intensive forestry difficult to practise.

Forest industry investments have been held back by the fact that lease holders can only use one or two wood assortments for themselves, and local markets for other wood assortments may not exist. In addition to the wood assortment issue, pulp industry growth has also been slow to materialise due to the vast investment requirement for new mills.

While there are hurdles in the Russian forestry and forest industry investments, success in the country is possible. Keys to successful investments include:

- A good geographic location, with a suitable timber resource, available markets for excess wood assortments and a reasonable infrastructure.
- A solid processing investment concept. This often requires partnering with another company to share the risk, and to gain operational or market expertise.
- A thorough understanding of the local business culture, forest policy and operating environment.

not be maximised, and the mill may become a liability rather than an asset. A thorough planning process is required to find answers to the following questions:

- What are the characteristics and volumes of wood to be processed?
- Which products can be manufactured (sizes, grades, lengths), and which markets can be served using the available raw material base?
- What kind of equipment best matches the raw

material volume and type, products to be produced, and skill levels of potential employees?

- How can the other wood assortments or by-products of the process be disposed of or sold? Does the lack of some roundwood assortments hinder the sale of the remaining roundwood?
- How is the necessary skill set for manufacturing acquired – through hiring or partnering with a manufacturing company?
- Is the forest land investor the sole owner of the processing facility, or is a joint venture with an existing manufacturer a better option?
- What potential social risks are involved in manufacturing, and how can these be minimised?

It is critically important that the top management understand and appreciate the new risks and management requirements that entry into a manufacturing business brings. Outside advisors combining knowledge in timberland management and wood processing can be of invaluable help in the planning process.

*Jussi Silventoinen
Senior Manager, Forest Industry Consulting*

SECURING WOOD SUPPLY IN RUSSIA

Russia is emerging as a key region for forest products manufacturing. As a result, many domestic and foreign investors are evaluating opportunities to build manufacturing capacity there. The country has vast forest resources, but access to economically viable timber is limited.

Indufor has assisted several companies in analysing available resources and in developing a harvesting organisation for sourcing timber, both in the European and eastern parts of Russia. Some of the complexities and solutions are discussed below.



Forest Road in Kirov, Russia (Photo Olli Leino)



Timber inventory and AAC

Regional governments provide timber leases to private companies, requiring that a certain level of harvest take place. These harvest volumes are defined in Allowed Annual Cut (AAC) figures by both sub-region and species. However, these government figures should not be considered a direct indication of the true availability of timber. The following questions need to be answered before proceeding with major capital investments:

- Do the AAC figures correspond with the actual growing stock volumes?
- Is the species mix the same as the one shown in the AAC?
- Are the age classes suitable for harvesting?
- How can the timber volume be accurately verified in a cost-effective and prompt manner, when leased areas can amount to millions of hectares?

Indufor and the Technical Research Centre of Finland (VTT) have jointly developed a methodology that can answer the above questions, using satellite imaging. Satellite image interpretation is based on true ground reflectance values of the targets. In practice, this means that each spectral class in the image is combined with the ground data obtained from the target area by matching the measured parameter values and the spectral values of every ground measurement point. Each pixel therefore represents a certain volume and species mix within the forest or other land cover class (e.g. water, field, or clear-cut). While this analysis does not provide operational harvest-unit level data, it does give a clear indication of what the volumes, tree sizes and species mixes are in various parts of the lease areas.

Harvesting and transportation

In addition to the actual timber volume data, there are other questions related to the sourcing of the wood:

- What are the conditions of the road network and the availability of rail transportation in the lease area?
- What is the terrain like (e.g. wet soils or mountains), and are the leased areas accessible during different times of the year?
- What is the best suited harvesting and hauling equipment for various regions of the lease area?
- How much hauling capacity is needed, considering the seasonal variation in road access and the annual harvest volume requirements in different parts of the lease area?
- Is there a skilled labour force available for both management and operations? What type of organisation could be created?

During the inventory phase of the work, Indufor inspects the road network in the area and tracks the roads

with GPS by road category. Together with the inventory and AAC data, this allows us to determine the required level of road construction/improvement, the transportation distances on various road types, and the logical places for intermediate storage yards.



IKONOS 4m resolution satellite picture Russia (Photo: VTT)

By knowing (1) the annual harvest requirements/capabilities in various parts of the lease area, (2) distances and road types, and (3) seasonal storage volumes, we calculate the need for harvesting and hauling equipment and staffing. The analysis commonly includes a comparison of various techniques (cut-to-length vs. tree-length, western vs. Russian trucks) and the best solution may well be a combination of various systems. Road construction costs and distances vary from region to region. "One size fits all" solutions do not exist.

Business model

A critical part of planning the organisation of timber sourcing is its financial feasibility and impact on the parent company. Key questions in considering the business case for the operation are:

- How much and what sizes and species of timber will the plant consume? Equipment choices at the processing may have an impact on the selection of harvesting and hauling equipment.
- What are the markets for wood not used by the company itself, and what are the likely price levels that can be achieved by selling the wood? In many cases, the harvesting organisation is put in place prior to the start-up of the plant, and all wood assortments are initially sold.
- Is there a need for purchase of additional wood? If the lease areas cannot supply 100% of the wood that the plant will need, where can additional wood be sourced and at what price? Can wood be purchased delivered to the mill, or is additional hauling capacity required?
- What are the investment requirements of harvesting and hauling the wood?
- What are the operational costs, expected manning requirements and revenues?



In project analysis, Indufor builds a detailed financial model for forestry operations, including all key financial ratios. Harvesting operations as such are commonly not very profitable. Therefore, detailed planning is necessary to understand the financial impact of the operation on the parent company, the critical sensitivity factors, and their impact on performance.

Currently, there are many legislated social obligations that accompany forest investments. For example, an investor may have an obligation to build schools or clinics, or deliver firewood. In the future, social risk considerations may exceed the legislated issues, and become an important factor in risk mitigation.

*Ilkka Norjamäki
Forest and Environmental Management Specialist*

NEWS FROM INDUFOR

- **Indufor has become a prominent provider of services related to forest asset valuations and timber land investments.** During the first half of 2009 Indufor carried out forest asset valuations in China, Malaysia, Indonesia, Romania, Swaziland and Argentina. Over the past three years Indufor's in-house valuation team was involved in over 30 related assignments.
- **Indufor's recent services for the forest industry have focused on practical development processes.** We have helped a particle board manufacturer develop its wood procurement functions, worked with a plywood producer in developing markets and clients for new value-added products, and we are in the process of developing forestry operations for a Russian wood processing company.
- **Public-private partnerships and promotion of the private sector** are in special focus of Indufor's public sector assignments in 2009:
 - Capacity building and advisory services for local forest administration in Northwest Russia with the support of the Finnish Ministry of Agriculture and Forestry.
 - Development of aid instruments that promote private sector opportunities in developing countries for the Ministry of Foreign Affairs of Finland.
- Indufor signed a contract worth EUR 4.85 million with the Ministry for Foreign Affairs of Finland for the provision of technical assistance services to **"Supporting National Forestry Program in Mozambique"** for the period of 2009-2014. The Program will strengthen capacity of the country's forest sector to address the challenges of sustainable management of forests and wildlife as a con-

tribution for poverty reduction, income generation and climate change adaptation and mitigation. The project started in September 2009.

- The European Bank for Reconstruction and Development, EBRD, issued a contract to Indufor for **"Support for Forest Certification in Ivano-Frankivsk Oblast"**. The two-year project started in July 2009, and the certification is aimed at supporting a number of wood processing facilities in Western Ukraine.
- Indufor was awarded a medal for the work carried out for the promotion of the goals and operations of **The Finnish Society of Forest Science**. In this context, the Finnish Forest Economics Forum, operating under the Society, organised the 20th anniversary jubilee seminar "Future Wealth from Forests" in April 2009 in Helsinki. With the support of Indufor, the Forum had invited Professor Jeffrey R. Vincent from Duke University, USA, as the Key Note Lecturer of the seminar.

APPOINTMENTS AND NEW STAFF

Mr. **Allan Flink**, Forest Industry Specialist at Indufor, has been appointed Regional Manager for Russia in April 2009.



Mr. **Tapani Pahkasalo**, Forest Economist at Indufor since January 2007, has been nominated Regional Manager, China and Southeast Asia in September 2009.



Ms. **Marjo Maidell**, M. Sc. For., joined the Forest and Environmental Management team in January 2009 as a Forest Economist.



Mr. **Olli Leino**, M.Sc. For., joined the Indufor team as a Forest Resource Assessment Specialist in March 2009. He is also working on his Ph.D. in forest inventory.



Ms. **Karoliina Lindroos**, M. Sc. For., joined Indufor's Forest Policy team as a Forest Policy Specialist in March 2009. Ms Lindroos worked previously with the FAO Forest Department in Rome.

