



## Featured Topics

### Newsprint Consumption Declines in the United States

Lauri Hetemäki\*

The United States is the world's biggest consumer of newsprint, with about one third of the total world consumption. The US market is about the same size as the entire European market. One key difference between the two continents, however, is that only about half of US newsprint consumption is met by domestic newsprint production, whereas in Europe production exceeds consumption. Any changes in US newsprint demand will thus also have a significant impact on the world market. What, then, is the long-term outlook for US newsprint consumption?

#### FAO Predicts Increase in Consumption

The Food and Agricultural Organisation of the United Nations (FAO) has been publishing consumption forecasts for forest industry products for the past several decades. Its latest forecasting report, produced in 1999, is based on an econometric model and statistical data for the period 1960–1994. The report includes a projection of US newsprint consumption for the years 1995–2010. As illustrated in Figure 1, the forecast shows that US newsprint consumption will increase from 11.9 million tonnes in 1994 to 16.4 million tonnes in 2010.<sup>1</sup> The figure also shows that this trend follows the FAO forecast of the United States' GDP. This is not unexpected, as paper consumption has generally followed the trend in economic growth and population growth: an increase in

these has usually been accompanied by an increase in paper consumption. The FAO forecast is based on the assumption that real GDP growth in the United States will continue at an annual rate of 2.4 per cent up to 2010, and that US newsprint consumption will respond to changes in GDP in the same way it has in the period 1960–1994, on average. The future is thus seen as being much the same as the past: newsprint consumption will keep on growing.

The FAO estimate should, however, be viewed with caution. For example, a comparison with the actual figures for 1995–2000 shows that the FAO forecast has overestimated the trend. In 2000, for instance, a consumption of 13.5 million tonnes was forecast but turned out to be 12.2 million tonnes.<sup>2</sup> The stagnating trend in consumption is particularly unexpected because US economic growth was exceptionally strong in the 1990s, population growth was fairly high and newsprint prices fell in real terms. Moreover, this slowdown in consumption is

- 1 A slight downward adjustment has been made to the FAO (1999) figures to allow them to be compared with figures from the Newspaper Association of America (see Hetemäki and Obersteiner 2001). The FAO figures for 1994 and 2010 are 12.6 and 17.2 million tonnes.
- 2 Consumption in January–July 2001 was down by 12.6 per cent on the same period the previous year. If the figures for the full year show the same trend, consumption in 2001 will total 10.6 million tonnes, or 3.2 million tonnes less than the FAO forecast.

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not a temporary phenomenon because newsprint consumption has not been able to return to the peak consumption level of 1987 during the last 13 years.

### Structural Change in Consumption

According to a study by Hetemäki and Obersteiner (2001), newsprint consumption in the United States experienced a structural change in the late 1980s (see also Hetemäki 2001a,b). The study analysed newsprint consumption in two different periods: 1971–1987 and 1987–2000. In the latter period, the relationship between GDP and newsprint consumption (income elasticity) became negative, implying that economic growth has reduced newsprint consumption. One possible explanation is that the increase in prosperity has enabled consumers to acquire more electronic communications equipment, computers, Internet connections, etc., the use of which has in turn acted as a substitute for reading newspapers.

The results also indicate, however, that the relationship between GDP and newsprint consumption

in the period 1987–2000 is not statistically significant. In other words, changes in GDP no longer provide a sufficient explanation for changes in newsprint consumption. Irrespective of whether newsprint consumption and GDP are considered in total or on a per capita basis, the same conclusion still holds. A historically significant structural change has thus occurred, and the positive ratio that earlier prevailed between GDP and newsprint consumption has changed and lost its predictive power. Dramatic changes in GDP growth may nevertheless continue to be reflected in newsprint consumption. This year, for example, GDP growth has slowed considerably in the United States and has been accompanied by a marked reduction in newsprint consumption.

Finally, the results of the study also show that changes in newsprint prices have had no statistically significant effect on consumption in the period after 1987. This leads to the further conclusion that newsprint prices, which had been used for decades as a predictor of newsprint consumption over the longer term, are no longer so relevant in forecasting.

The Hetemäki and Obersteiner (2001) projection of US newsprint consumption for 2001–2010 is shown in Figure 1. According to this forecast, the consumption in 2010 is some 4.5 million tonnes lower than the FAO forecast for the same year. The difference between these forecasts is equivalent to the annual production of about 13 modern newsprint paper machines, or about two thirds of domestic newsprint production in the United States (6.5 million tonnes). Although the forecast by Hetemäki and Obersteiner is based on an econometric model that uses only data for the period after the structural change (i.e. 1987 onwards), the variables used in the model (GDP, newsprint price and a consumption adjustment variable) do not fully explain the trend observed in the last 13 years. Caution should therefore be used when considering the predictive power of this model too. Hetemäki and Obersteiner acknowledge that, in view of the problems concerning their model and on the basis of other market information, their forecasts are probably too optimistic. The prospect that newsprint consumption may fall from even its present level is supported by some

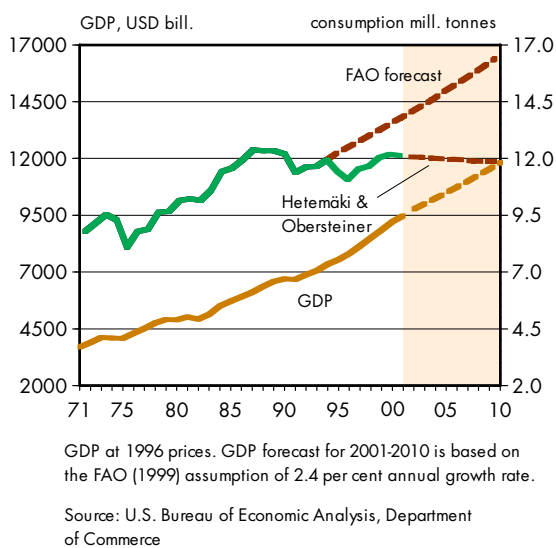


Figure 1. Newsprint consumption and GDP in the United States, trends and forecasts, 1971–2010f

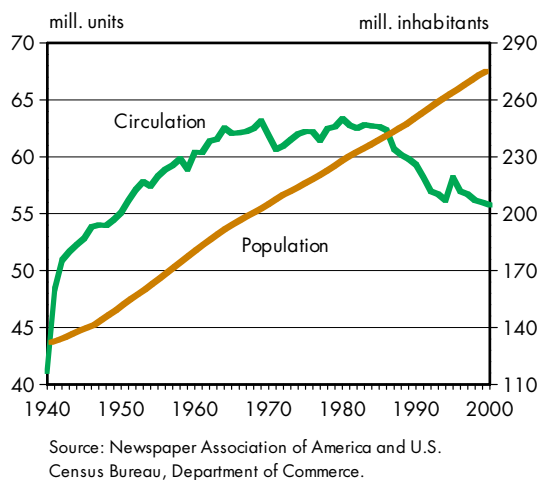


Figure 2. Circulation of daily newspapers and the total population of the United States, 1940–2000

recent statistics and consumer surveys on media usage in the United States.

### Internet Replacing Newspapers

One of the reasons behind the structural change in US newsprint consumption is the reduction in newspaper readers. Statistics from the Newspaper Association of America (NAA) show that in 1980 daily newspapers were read regularly by about 70 per cent of all Americans, but by 2000 this had shrunk to 55 per cent. Consistent with this declining readership trend is the drop in newspaper circulations (Figure 2). The circulation of daily newspapers has not increased since 1980, and has in fact been declining since 1987, despite the steadily growing population (and GDP). This may be partly because the increasing use of electronic media (especially TV and the Internet) has replaced newspaper reading.

A recent study by the NAA (2001) examined media use by adults (over 18) in the United States. The study's main conclusion is that the growing Internet usage of the past few years has rapidly displaced other communications media. As expected, Internet use by young people was found to be partic-

ularly significant and to be displacing newspaper reading. The behaviour of young people today and in the future will undoubtedly exert an ever stronger influence on future trends. Estimates by the Boston Consulting Group (1999) also indicate that Internet use is reducing newsprint consumption in the United States, by a forecast 16 per cent in the period 1996–2003. Newsprint consumption forecasts of this kind, which take account of changing media use, will prove useful in the future, when movements in GDP and newsprint prices will probably have only a minor effect on newsprint consumption.

The trend in the United States is not unique. Indeed there are similar signs in some other technologically advanced countries. In Japan, for example, which is the world's second biggest economy, newsprint consumption has been declining since 1991. Japan's share of world newsprint consumption in 2000 was about 10 per cent. Although the trend in Japan has probably also been influenced by the downturn in the Japanese economy that has continued throughout the 1990s, this does not seem to explain everything. Consumption of other printing and writing papers, for instance, has continued to grow despite the recession. Amongst Finland's main export markets, the United Kingdom has shown signs of a downturn in newsprint consumption since the peak of 1997. By contrast, newsprint consumption in Germany and in the European Union as a whole has continued to grow significantly.

### Competition Increases on Finland's Export Markets

What impact is the declining US newsprint consumption going to have on the Finnish forest industry? The direct effects on newsprint production and exports are, in fact, insignificant, because the US accounts for only less than two per cent of Finnish newsprint exports. However, the indirect effects could be significant. Since half of US consumption is based on imports, the countries exporting to the US (mainly Canada) will be looking for new markets to make up for the drop in demand in the United States. This will be offset somewhat by the fact that

domestic newsprint production in the US is projected to fall. The FAO capacity survey (2001), for example, indicates that US newsprint production will fall in 2000–2005 by almost six per cent. If the reduction in newsprint supply is less than the drop in demand, an oversupply situation will be created on the US market. The probable consequence of this would be tougher competition, spreading to Finland's main export markets, especially in the European Union. This would also add to pressures to reduce newsprint prices.

A decline in newsprint consumption would also have an adverse effect on the operating environment of Finnish companies' newsprint mills located in other countries. These companies might then seek to expand their market shares in newsprint markets which are growing (e.g. in Asia) and to direct more attention to other paper and paperboard products. This, in turn, would tend to increase competition on the 'new' newsprint markets and in other product groups.

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## Power Supply for the Finnish Paper Industry in a Deregulated Electricity Market

Johanna Pohjola and Thomas Rimmler

Tougher competition and higher profit expectations on the part of shareholders have required the Finnish paper industry to improve the efficiency of its resource use. Efforts to achieve this have included selling off individual power plants and transferring the responsibility for power supply to subcontractors. Stora Enso's decision to sell a considerable share of its electricity generating capacity is also linked to the wider change in the paper industry's strategy, which has shifted from an emphasis on resources to an emphasis on core business. The deregulation of the Finnish electricity market has helped to further the implementation of this new strategy. A key question is whether or not paper producers should give up their electricity generating capacity in this new market situation and rely instead on the ability of the market to supply their power needs at a reasonable price. The benefits and risks involved are discussed below.

### Power-Intensive Papers Offer the Best Competitive Edge

Cheap electricity has been a key factor in the product strategy of the Finnish paper industry. This strategy has emphasised the use of unseasoned spruce fibre in magazine paper production. Manufacture of magazine paper is based on grinding spruce fibre, which requires a relatively high input of electrical energy. Magazine papers have accounted for around 40 per cent of paper and paperboard production in the Finnish paper industry, whereas in other European countries they have averaged about 10 per cent.

Finnish pulp and paper mills obtain about 40 per cent of their electricity from on-site power plants. The majority of this is backpressure power produced using process waste from pulp production. Paper industry companies have also secured their power supply by acquiring off-site power plants and pur-

chasing power quotas from Pohjolan Voima, the Finnish industry's jointly owned power provider. In this way the forest companies have guaranteed almost full self-sufficiency in electricity for their mills in Finland.

### Monopoly Prices Avoided by Having In-House Power Production

Vertical integration in the Finnish paper industry has traditionally been seen as a means of reducing the risks surrounding the price of raw materials and energy supplies. Before the new Electricity Market Act came into force, the wholesale electricity markets were controlled by a single state power company, which owned both a major share of the national power production facilities and the transmission lines. By controlling its own energy production chain, the paper industry ensured it could obtain its energy at below the monopoly price.

The opening up of the Finnish electricity market to competition reduces the scope for monopoly pricing and thus reduces the potential cost savings possible with integrated energy production. The framework for competition was established by the new Electricity Market Act. Although the price of electricity has fallen, the creation of a competitive environment has been hampered by the limited number of suppliers, the inadequacy of cross-border transmission arrangements and public ownership.

### Forest Companies Have Different Strategies

The forest companies have responded to the new market situation in different ways. Stora Enso has announced that it will be giving up not only the off-site power plants it owns but also its power quotas in

Pohjolan Voima's electricity generating capacity. If the sale goes through, the company's self-sufficiency in electricity will fall to 40 per cent. UPM-Kymmene, on the other hand, intends to secure its power supply for the future mainly by continuing with ownership-based resources. It estimates that in the longer term it could buy perhaps 10 per cent of its power from the market.

### Capital and Skills Released for Developing Core Business

There are financial risks involved in owning a power plant because of the long pay-back period of the investment. Moreover, the profitability of a large power plant as a long-term investment is sensitive to changes in interest rates. Changes can also occur in fuel costs, security of supplies and environmental and energy policy, which could not have been foreseen when making the investment decision.

The return on power plants has been considerably lower than the return on investment required by the forest industry. Selling off-site power assets can release capital for investment in developing core business areas with a better return. Finding buyers for power plants has become easier with the deregulation of the electricity market and the arrival of newcomers to the Nordic market from elsewhere. There is no longer a desire to commit capital to securing resource inputs, which is also evident in the expressed intentions to sell forest land.

### Relying on the Market Increases Uncertainty about Electricity Prices

The alternatives to producing electricity in-house are to buy it in, either from the spot market or by concluding different supply agreements on the OTC market. A special feature of the Nordic electricity markets is their sensitivity to fluctuations in rain and snowfall because of the high percentage of hydro-power used. Significant peaks can occur in the price of market electricity in years of low precipitation, because the spot price will tend to be determined by

the power plants with the highest variable costs. By contrast, in years of abundant precipitation the price can fall very low. The spot price has, in fact, varied greatly. The more inflexible the market, the more often the price peaks can occur and the bigger they can be. With a supply agreement, however, the electricity price can be fixed at a certain level. A long supply agreement is, in this sense, equivalent to ownership of a power plant. The risk is that the market price remains below the fixed price for the duration of the agreement.

Any operating or structural problems occurring in the electricity market could lead to a permanent increase in prices. The long-term functioning of the Finnish electricity market has been drawn into question because no incentive has been created for building new capacity. Scenarios concerning the future of the electricity market include forecasts of higher demand, which will require further investment. Despite this, forward prices, which reflect the future outlook, indicate that the market does not appear to believe in any capacity shortage. Forward prices are barely above this year's level, and new investment is clearly not profitable at these prices. However, the forward prices only extend three years ahead at most.

Since the electricity market reforms, the European electricity markets have shown a tendency towards concentrating into larger and fewer units. If this trend continues, there is a danger that the savings in costs achieved through merger will not be passed on to electricity prices. Instead, suppliers may exploit their market power and even raise prices. The Nordic electricity markets are already dominated by just a few large producers. In general, expanding market size can counteract the effect of mergers on market efficiency. The Nordic markets may gain efficiency if they were to expand into Central Europe. However, this would require a substantial investment in transmission lines.

## Financial Market Contracts only Provide Protection against Short-Term Risks

Buying electricity from the market thus means greater uncertainty about prices than in a situation of self-sufficiency, in both the short and the long term. Derivatives can be used to hedge against the price risks, but for no more than a few years. Hardly any agreements longer than this have been signed on the OTC market either. The more convergent the view on prices held by the different parties in the market, the more expensive this hedging becomes. On the deregulated electricity market, electricity sales and the associated risk management will demand a new kind of know-how that the paper industry can either acquire itself or can purchase from experts in the field. Electricity costs can be reduced significantly with successful risk management.

Maintaining some power generating capacity in-house can be a justifiable protective strategy if it is still felt that there is a substantial price risk with market electricity. Such power generating capacity will function as insurance against high market prices. It would be profitable to switch to in-house production whenever the variable costs of power generation are below the price of market electricity. Correspondingly, power generation could be interrupted when the price of market electricity falls lower than the cost of in-house production. The shorter the running time, the more expensive this kind of hedging becomes. The paper industry's own electricity generating capacity could also help prevent any capacity shortfalls occurring in the electricity market as a whole and keep market prices low.

## Guaranteeing Competitive Market Pricing Most Important

In assessing whether or not the paper industry would benefit from relying on the market for its power supply, the key factor is the ability of the market to guarantee an economical supply of electricity. The dangers of market concentration for market pricing can be avoided by increasing the size of the market, as stated above. Efforts to expand the Nordic electricity

market into the Baltic countries and Central Europe are essential if competition is to be promoted. Market expansion can be promoted by encouraging transmission companies to invest in transmission lines and by eliminating cross-border transmission tariffs. Expansion of the electricity market to areas outside the European Union would, however, encounter problems regarding environmental standards and the need to dismantle existing energy sector structures as required by the single electricity market directive. The market mechanism alone may not prove to be sufficient to produce a common market. Measures to promote expansion of the electricity market will nevertheless support the market's functioning and thus reduce the risks concerning the paper industry's loss of self-sufficiency in power generation.

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## Social Sustainability in Forest Policy

Muru Juurola and Pekka Ollonqvist

In 1999, the Finnish Government gave formal approval to the implementation of Finland's National Forest Programme 2010. The policy agenda of the Programme can be characterised as Sustainable Forest Management. The Programme incorporates an integrated balance of economic, ecological and social sustainability. Although social sustainability is not new as a forest policy objective, its substance has remained largely undefined. The vitality of communities and the opportunities for individuals to participate and to realise their own goals are now key considerations for forest policy. Taking account of different viewpoints and both the quantitative and qualitative consequences of changes for forestry at the regional and local level will also be very important considerations for social sustainability. The newly appointed Regional Forest Councils constitute a new channel for consideration of social sustainability issues in forestry.

The values associated with forests and social wellbeing are closely integrated with the established culture of forestry and its history and social practices. In regard to economic sustainability, forest policy will continue the tradition of previous national forest programmes by focusing on how to improve the profitability of timber production. Ecological and social sustainability have, however, brought new kinds of objectives. Participation is a new element in the forest policy arena. Every effort will be made to take account of the different assessments and opinions of all those affected by policy changes. For social sustainability, it is essential that decision-making takes full account of the need to promote wellbeing within communities. This should focus on the vitality of communities and maximising their wellbeing (Romm 1993, Hytönen 2001). Change can only be socially sustainable if those people affected are able to adjust to the new conditions. Any 'socially sustainable forestry model' will be dependent on the particular locality and circumstances, and

so a goal-oriented definition of social sustainability is not possible.

Implementation of this new forest policy agenda and its dimensions of sustainability will be a challenging task to be taken up especially at the regional and local level where often the best expertise is to be found. Below we will focus on the main social sustainability issues in the history of forest policy in Finland, particularly issues of vitality at the local level.

### Three Grand Objectives of Previous Finnish Forest Policy

Until the mid-1990s, Finnish forest policy was an integral part of economic policy and subject to the same policy agenda. The key parameters of the first major forest policy objective, characterised as Sustainable Timber Management, were forest breeding through careful selection of trees, the promotion of single species natural regeneration, non-industrial private forestry, re-employment of the rural workforce surplus, and increasing the forest industry's wood consumption. The first national forest programme, in 1929, promoted rational silvicultural practices and the effective use of timber resources.

The second major forest policy objective, Progressive Timber Management, was adopted in the early 1960s. The key parameters of the policy were forest regeneration using trees produced in seed orchards, increased investment subsidies to expand efficient timber production and systematic expansion of production capacity and hence of wood consumption in the forest industry (Ollonqvist 1998). These were linked with the objectives of economic growth, and forest policy was increasingly an integral part of economic policy and macroeconomic planning. In the 1964–1969 national forest programmes (the MERA programmes), efficient and intensive timber production was declared essential for the growth of forest industry production. Issues of rural employ-

ment and vitality in local communities were merely the constraints of macroeconomic planning, although efforts were made at every programme stage to find ways to preserve rural employment and the continuity of timber production.

Questions of multiple use of the forests were given little attention in the implementation of the Forest 2000 programme of the mid-1980s, despite the discussion of multiple-use issues alongside timber production investment and full use of maximum sustainable removals. The programme stressed the importance of timber production planning and advisory services for non-industrial private forest owners. The Forest 2000 programme introduced the third forest policy objective, Regional and Farm-Level Progressive Timber Management, into the forest policy arena. The committee revising the Forest 2000 programme in 1992 highlighted the need for measures to encourage the establishment of joint ownership forest companies and to stimulate interest in forest sector occupations.

### Social Sustainability of Non-Industrial Private Forest Ownership and Local Communities

The extensive research on the motives and behaviour of non-industrial private forest owners was applied in the policy implementation of the Progressive Timber Management objective, but only in the context of the potential for more efficient timber production. The other aims of non-industrial private forest owners and the wellbeing of local communities (in rural municipalities and villages) remained secondary considerations in the forest policy agenda. The links between the vitality of rural communities and the efficiency of timber production were not discussed.

The number of non-industrial private forest holdings of 20–100 hectares and their combined surface area has remained stable since the 1950s. Structural changes in non-industrial private forestry have occurred in both the smallest holdings (under 20 hectares) and the biggest holdings (over 100 hectares). Last year, there were about 280 000 forest holdings under 20 hectares in size, accounting for some 64 per cent of all non-industrial private forest

holdings. Their combined surface area was about 19 per cent of the non-industrial private forest land. The supply of commercial timber from these holdings each year is around 6.5 million cubic metres, which is less than 10 per cent of the annual volume target of Finland's National Forest Programme 2010. The timber production decisions taken by these forest owners will therefore have only a minor effect on the achievement of the Programme's targets. By contrast, the decisions on timber production and supply in private forest holdings larger than 20 hectares will be decisive for the achievement of the Programme's targets.

The forest policy agenda of the Progressive Timber Management objective emphasised the need to tackle the problems associated with systematic reductions and imbalances in the exploitation of maximum sustainable removals. The declining rural population and the affect on the vitality of rural communities have once again made family forestry a topical concern from the perspective of economic sustainability. The significance of small-scale forest holdings for the social sustainability of regional and local communities is related more to the number of owners than the annual timber volumes. Half of all owners of forest holdings smaller than 20 hectares are releases from the obligation to pay fees to a local forest management association, which means they are not included in the activities of the associations.

Small-scale holdings would be likely to benefit from the institutions developed to promote cooperation in forestry. Various forms of cooperation have been proposed in previous national forest programmes, including joint ownership and other aspects. Examples are joint ownership units, limited companies and forest partnership areas. Many joint ownership units were actively established in the difficult years following the Second World War. Today, there are 140 such units, which together account for almost four per cent of the land under non-industrial private forestry. Promoting the establishment of limited companies was repeatedly stressed in previous national forest programmes, but such companies are still absent. Forest partnership areas, which do not limit private ownership, are distributed unevenly across the country. In the mid-1990s, more than half

of all local forest management associations were without any active forest partnership areas.

Eco-forestry business activity has been actively developed since the mid-1990s. Cooperation in this area, as in others, offers considerable potential for strengthening the social sustainability of rural communities.

### Local Forest Workers and Social Sustainability

A high proportion of non-industrial private forest owners live in urban areas. This urbanisation has the effect of reducing stumpage earnings and other income available in the local rural communities. The growth in mechanisation of timber harvesting and logistics has considerably reduced the number of forest workers in local communities since the early 1960s. These changes will have a direct effect on the social sustainability of communities and indirectly on the economic sustainability.

Last year there were about 3000 forest workers in Finland, representing around one third of the paid work in silviculture. The existence of these professional forest workers in rural communities contributes to the social sustainability of forestry both directly and indirectly. It has become difficult to obtain the services of these professionals for forest regeneration and improvement work. Those non-industrial private forest owners who cannot or will not do silvicultural work themselves will be in trouble in many communities if there are no forest workers available in the future.

### Social Sustainability and Participation

The forestry policy objectives of Sustainable Timber Management and Progressive Timber Management were dominated by the timber production targets and top-down policy implementation, respectively. The current policy agenda of Sustainable Forest Management must live with the strengths and weaknesses of the previous agendas and their cultural heritage must be critically evaluated. Promoting the social sustainability of forestry demands that the alternatives for promoting social wellbeing be defined and evaluated. The challenge for the National Forest Programme

2010 is to activate forest owners and other interested parties to engage in forest policy planning at the regional and local level. Planning should not be limited to optimistic calculations prepared by high-level experts for top-down policy implementation. The Regional Forest Councils, appointed in summer 2001, face the challenge of monitoring and revising the regional forest programmes in the future. They will have to develop the new policy agenda to meet regional policy needs, develop channels for participation and promote bottom-up policies. The special features of regional forest policy can and must be taken into consideration more effectively to ensure that regional and local communities participate in forest policy planning (for a discussion of social capital in policy formulation see e.g. Beckley 1995, Bebbington and Kopp 1998). The great number of non-industrial private forest owners in Finland represents a major resource for the new forest policy agenda. Their active involvement in the policy process will be essential in defining future policy options at the regional and local level.

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# **‘The System of Forecasting Business Cycles in the Forest Sector’**

A research project of the Finnish Forest Research Institute (METLA)

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## Project tasks

- To produce the *Finnish Forest Sector Economic Outlook*
- To develop models for forecasting exports of Finnish forest industry products
- To develop forecasting models for roundwood markets
- To produce market reviews on the forest sector
- To develop and maintain the MESU database

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## **The Finnish Forest Sector Economic Outlook**

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The Finnish Forest Sector Economic Outlook is an annual publication on the business cycles of the Finnish forest industry and forestry sector. It gives an overview of the development of the entire forest sector and includes forecasts for the export volumes and prices of Finnish forest industry products, roundwood consumption and prices, employment in the sector, and investment in private forestry. In addition, the Economic Outlook contains several short articles on topical matters in the forest sector.

The Economic Outlook has been published in Finnish since 1991, and in English since 1998. It is produced at the Vantaa Research Centre of the Finnish Forest Research Institute (METLA). The Institute, established in 1918, is an independent research organisation under the Ministry of Agriculture and Forestry. It produces research-based information on the forest environment, multiple use of forests, forestry practices and the forest industry. It is Europe's largest forest research institute and has a permanent staff of 750, including almost 200 researchers.