

Outlook for Finland's Forest Industry Production and Wood Consumption for 2015 and 2020

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This document presents the summary and conclusions of the Finnish Forest Research Institute (Metla) outlook study, published in May 27, 2009.¹

Forest Industry Production, Wood Consumption, and Wood Energy Sector

Table 1 summarizes the forecasts for the Finnish forestry industry production and wood consumption for 2015 and 2020. The pulp and paper industry production has been forecasted to decrease by up to a third and the wood processing production by just a fifth from 2007 to 2020. The declining trend is mainly due to the weakening of Finland's main exports markets and also the weakening competitiveness of the Finnish production relative to major competing countries e.g. in West Europe, Asia and Sweden.

The weakening of export markets are basically a result of three factors. First, the global economic slump is affecting negatively the demand and prices of the pulp and paper products. Secondly, the structural change in the communication paper (printing and writing papers and newsprint) markets is continuing. That is, the electronic media is increasingly replacing print media, which results to lower paper demand level, and also negatively affects the price prospects. The paper companies are no more competing only against the other paper companies, but also against the electronic media companies. As a result, the pricing power of paper companies is weakened. It is anticipated that the economic slump is likely to speed up this structural change. Thirdly, the increasing competition and supply of paper products from Asia (particularly China) to Western markets increases the competition in export markets.

Given the above development, the prospects of the paper production in Finland rests on its ability to compete in increasingly tight and declining export markets. The analysis in this report indicates that a part of the Finnish production capacity will not be competitive enough, and there will be further capacity shut downs. The outlook anticipates that Finland's market share in the export markets is going to decline.

In the global wood products markets, there is no similar structural change taking place as

¹ This document is an English translation and a summary of the results and conclusions of the following report: Hetemäki, L. & Hänninen, R. Arvio Suomen puunjalostuksen tuotannosta ja puunkäytöstä vuosina 2015 ja 2020 (Outlook for forest industry production and wood consumption for 2015 and 2020). Metla Workingpapers, No. 122, 2009. The report is in Finnish, and freely downloadable from: <http://www.metla.fi/julkaisut/workingpapers/2009/mwp122.htm>

is the case in communication paper markets. Wood products consumption is still forecasted to increase in Finland's main export markets in Europe's, albeit rather slowly. Assuming that the declining price trend in the sawnwood markets continues, the Finnish industry cannot preserve its market shares in the export markets, but lose them to countries that have lower production costs, like Russia, new Eastern European manufacturing countries and also Germany. In Sweden, the roundwood prices relative to sawnwood prices have been more advantageous than in Finland. Sweden has also benefited from the exchange rate changes – euro has strengthened against Swedish krona. In the long run, however, Sweden's advantage over Finland is not necessarily going to continue. Thus, Sweden also has to develop its wood product industry. Even though the level of the wood products production is forecasted to decrease in Finland, the turnover may increase if the share of more value added products is increasing.

Table 1. Finnish Forest Industry Production in 2007 and Outlook for 2015 and 2020 (*mil. tons and mil.m³*)

	2007	2015	2020	Change 2007 vs. 2020	
				Quantity	%
Paper and paperboard	14.3	10.8	9.4	4.9	-34
Pulp	12.9	9.0	7.5	5.4	-38
Wood Products	14.3	11.8	11.9	2.4	-17

There are large uncertainties related to the wood products industry's outlook. For example, there is a possibility that the wood products consumption in the main export markets in Europe increase more than anticipated in this report. This could happen for example, if the wood consumption per capita in Western Europe would rise towards the levels seen in Finland and Sweden. Currently, the annual consumption of coniferous sawnwood per capita in Finland is 1.1 m³ and in Sweden 0.82 m³, but only 0.2 m³ in Western Europe.

The concerns related to climate change could work for the benefit of wood products. Given that wood products sequester carbon, and the production and use of wood results to lower carbon emissions than competing materials, such as, concrete steel, aluminium and plastics, the desirability of wood usage is likely to increase. This could materialize in Europe to wood consumption per capita levels that were closer to those seen in Finland and Sweden than is currently the case currently. Finland is an example of a case, where the wood consumption level changed rather dramatically in a relatively short period of time. The per capita level of consumption of sawnwood roughly doubled in Finland in the past decade or so.

In case of Finland, it seems likely that relative importance of wood products industry is increasing in the future, and conversely the relative importance of pulp and paper industry is declining.

The outlook for Finland's forest products industry also indicates that the use of pulpwood will decrease at a much greater rate than sawlogs (table 2). However, this difference does not show up as strongly in the domestic consumption of pulpwood. The pulp industry has been relatively more dependent on imported wood than the wood products industry. Due to Russian roundwood export taxes, the wood imports to Finland have been declining, and will most likely to do so also in the future. Consequently, the pulp industry utilization of imported wood is expected to decrease significantly, and respectively the domestic pulpwood consumption is likely to increase. Given the outlook in this report, also significant change in the wood chip and sawdust market is anticipated. If the forecast were realized, it would mean that by 2020 the saw and plywood industry would produce significantly more wood chip and sawdust than the pulp industry would have use for. This would leave more room for the energy use of woody biomass.

Table 2. Finnish Forest Industry Wood Consumption in 2007 and Outlook for 2015 and 2020 (*mil.m³*)

	2007	2015	2020	Change 2007 vs. 2020	
				Quantity	%
Forest Industry total*	75.4	57.9	52.5	22.9	-30
<i>Domestic roundwood</i>	59.4	49.9	46.2	-13.2	-22
Pulp Industry**	53.6	38.8	33.1	20.5	-38
<i>Domestic roundwood</i>	29.3	25.9	22.2	7.1	-24
Wood Products Industry	32.7	26.0	26.4	6.3	-19
<i>Domestic roundwood</i>	29.7	24.0	24.4	5.3	-18

* does not include woodchips and sawdust; ** includes domestic and imported woodchips and sawdust

Wood Energy Prospects

Significant opportunities in Finland's wood processing industry development and its effects on the wood markets relates to energy production prospects. It is very probable that the pulp and paper industry and wood products industry as well as the energy industries will significantly increase the use of wood in energy production. In table 19, the forecast figures do not take into account the possibility of this increase, and therefore the figures for pulpwood consumption are likely to be too small. Also, the Table does not include forecasts for woodchip and wood residue consumption, both of which are likely to increase significantly due to energy production.

In this report, we have not produced quantitative forecasts of wood energy use. This would be require to analyze among other things, technological developments in forest biomass utilizing energy technology, global energy market developments, CO₂ price developments, as well as scenarios for energy and climate change polices. Due to the tight time schedule of the report, this type of analysis was out of the scope of the study.

It is likely that the utilization of forest biomass for energy production purposes will be based on versatile raw material base. For example, forest chip, wood chip and sawdust, black liquor and pulpwood are all possible raw materials. There are also alternative raw materials as peat, reed canary grass and industrial and municipal waste. The price development of the different biomass components is probably the single most significant factor, which will affect their use in the future. Because the biomass markets are just emerging in Finland, it is still very difficult to estimate the different raw material ratios for future utilization.

Besides the price development, the environmental impacts of the different biomass components will affect the use of raw materials. For example, if Finland adopts policy measures towards peat that increase the costs of its usage, this would most likely result to higher level of forest biomass utilization

In Finland there is a definite need for more detailed analyses of wood energy use. In particular, there is a need for a extensive assessment, which would considers all possible ways in which wood can be used in energy production. These assessments should also be based on the economical market analysis of the energy markets and emissions markets development, not just on engineering technology analyses. The assessment should also include policy simulation scenarios. These kinds of assessments will unavoidably include significant uncertainties but it should not be a reason to leave it undone. The uncertainties and the sensitiveness of the results to these, could be studied with help of scenario analysis.

Conclusions and Policy Implications

Previous long-term outlook studies for the Finnish forest industry production and wood consumption have typically overestimated actual development. The closest approximation to the trends now unfolding appears to have been the forecasts published in June 2006 by Metla (Hetemäki et al. 2006). Admittedly, even they now seem to be proving overoptimistic, even if the effects of the recession are not taken into account.² As a consequence of the unexpected slump, Metla's assessments are likely to turn out to be clear overestimations.³

Törmä and Reini (2008) applied the regional general equilibrium model in their forecast of pulp and paper industry production in Finland to the year 2015. They estimated that if the decisions to cut capacity in the years 2006–2008 are combined with the model's scenarios, 21.0–30.5 percent of the pulp and paper industry capacity could disappear by 2015. In other words, in terms of magnitude, the estimate would correspond to the one presented in this report.

Pöyry's (2005) scenarios concerning sawnwood and plywood are parallel to those constructed in this report. However, production is not estimated to decline to quite the degree that has been suggested here. In Pöyry's view, wood products industry production would decline from the 15.3 million cubic metres in 2005 to 11.7–14.2 million cubic metres in 2040, depending on the scenario. Pöyry considers the declining production to be due to the slow growth of demand in export markets and Finland's poor competitiveness in relation to the growing supply from Russia and Eastern Europe, as well as the limited availability of logs.

One of the reasons why the forecasts do not usually realize as such, is that the world is not as deterministic as the forecasts lead us to believe. For example, the forecasts presented here are based on trend analyses and many assumptions. If they were to be changed, the forecasts would also change. Although, we consider the chosen trend analyses and assumptions to be justified, nevertheless, it is highly unlikely that the forecasts would be realised as such. It is simply impossible to know the situation in 10 years' time in any detail. The present slump is a good reminder of the mostly unexpected course of development, the likes of which will always turn up.

Therefore, the forecasts provided in this study should be viewed as indicative rather than precise estimates. On the other hand, our own actions can also influence future

² Metla's forecasts for the declining paper and paperboard production to 2015 have already been realized, 6 years before the point in time forecast. If the currently used paper and paperboard capacity was to be utilized at a 95% capacity utilization ratio, the production figure would be precisely the average of Metla's estimate for 2015. Similarly, Metla's earlier production forecasts for the sawnwood and plywood industry look overoptimistic.

³ The Kaskinen pulp mill is probably the only significant closure decision of pulp and paper industry capacity already influenced by the currently ongoing slump.

developments. This fact also raises the question: to what extent could policy actions influence the competitiveness of the forest industry, so that the development could be diverted to take a course other than the one forecasted here?

Politics important, but effects limited

The single most important determinant of the level of the forest products production in Finland is the demand for the products, which mainly originates from export markets. Finnish politics can exert very little influence on this. Some influence can be exerted on the use of wood products in the domestic markets, for example by changing fire safety regulations in building construction. With paper and packaging products, there are no real means of making a difference.

A second important determinant of production levels is relative competitiveness of the Finnish forest industry. This in turn is determined largely by the cost development of production inputs and transport costs, efficiency of the production capacity, and exchange rate movements. Since Finland has adapted the euro currency, the Bank of Finland can no longer influence exchange rate. Neither is it possible to influence international transport costs. The cost of labour can, in principle, be influenced through e.g. taxation policy. In practice, however, taxation on labour is not easily altered on the basis of the viewpoint of a single sector.

Wood costs and the supply of wood can be influenced, for example through taxation policy and subsidies. These may have a significant bearing on the wood product industry, as wood costs are the largest single cost item in the sector. In the pulp and paper industry, the importance of wood costs is clearly lower. The price trends of other raw materials, mostly imported chemicals for the pulp and paper industry, cannot be influenced through domestic policy.

The pulp and paper industry is an important consumer of power, with the share of energy costs of the sector's production costs at almost 10 percent in 2006. Measures that would reduce this cost item would improve the competitiveness of the pulp and paper industry. Measures that would be effective relatively quickly would be significant. Conversely, a decision such as a new nuclear plant would make any difference only at a very long-run, and would be unlikely to affect the situation in the forecast period presented here. On the other hand, power usage by the forest industry is forecasted to decline considerably, mainly due to the declining capacity level.

The wood product industry is not an important consumer of purchased energy, but it may be a more significant energy producer than is currently the case. Subsidies granted for energy production would naturally improve the competitiveness of the sector. The pulp and paper industry has considered such measures to be harmful, because they could distort the markets.

The forest industry production efficiency located in Finland depends mostly on investments. Policy may have an indirect influence on this through creation of good investment conditions. However, the dominant factor affecting investment decisions is global development. For example, the strategies of the global forest industry companies operating in Finland stress the importance of foreign investments, mainly to Asia, Latin-America and Russia, rather than investments to domestic market.

In summary, it is evident that the domestic policy measures influence is mainly restricted to the wood and energy input costs, accounting for about a quarter of the total production costs in the pulp and paper industry. The remaining three quarters, the exchange rate and demand for the end products, are practically beyond the scope of any domestic policy influence. On this basis, it seems likely that it is very difficult to decisively change the outlook for forest industry production in Finland through domestic policy measures. In principle, the chances of influencing the development of the wood products industry through policy measures are better, particularly through measures associated with the wood markets. Moreover, a good 40 percent of wood products industry production ends up in the domestic market, which is why domestic conditions also bear a much greater significance than is the case with the pulp and paper industry.

Policy prioritisation

Policy measures should be targeted where they have the greatest chance of making a difference in the long-term. In this respect, wood products and developing new forest products come to the fore. Firstly, policy may be used to influence the development of wood products industry in Finland more strongly than that of the pulp and paper industry. On the other hand, the outlook for the wood products sector is better in any case. There is no foreseeable prospect of a similar structural change in the end use of the sector's products as in the demand for paper, an area where electronic media have begun to displace traditional paper-based communications. In addition, measures directed to mitigate climate change are likely to enhance the prospects of wood products (see below)

Biorefineries linked to pulp and paper mills and biopower plants at sawmills may open up interesting possibilities. Moreover, the energy industry is becoming an increasingly large wood processor in Finland. Wood-based growth of electricity and heat generation looks particularly promising.

The conclusion is that policy measures should be prioritized to support especially development that creates new production in Finland. On the other hand, less support would be directed for development work leading to products with production prospects mostly abroad.

Matching policy to structural change

Inasmuch as the restructuring of wood processing industry in Finland is based on the present forest industry companies, reform is wedded to the profitability of the production of current products. The more profitable it is the better are the preconditions for investing in new products. To enhance the viability and profitability of the current forest products production in Finland, the Government has implemented various policy measures. Important elements of these have been subsidies to wood production and tax cuts related to wood sales. Both of these policies aim to increase wood supply. In addition, there has been discussion about possible policy measures which would reduce the forest industry energy costs.

At the same time, forest industry companies are employing all means available to improve the profitability of their present production. The backbone of improving profitability has been cutting production capacity and labour force, as well as other efficiency measures. Undoubtedly, these measures will continue. As a result of capacity cuts, the pulp industry wood consumption has already fallen in recent years by an estimated 8 million cubic metres. In addition, the wood products industry wood consumption in 2008 was more than one fifth lower than in the 'good years' of the 2000s. Based on the forecasts presented in this report, the forest industry wood consumption would be about 13 million cubic metres lower in 2020 than in 2007. Similarly, the energy usage of the forest industry has already fallen by 12 percent between the years 2006 and 2008. In accordance with the forecasts in the present report, it will decline further by almost 30 percent by 2020.

In other words, the situation is paradoxical in some respects. Policy is directed to increase wood production and supply, and perhaps energy production. However, the measures taken by forest industry to boost profitability leads simultaneously to a reduction in wood and energy consumption. The situation raises the following questions: What should be the primary target of the policy? How could the policy measures and industry actions become mutually supportive in the best way?

A second message of the changes outlined here is that the policy should be directed particularly to enhance the prospects of wood products industry and energy industry utilizing forest biomass. These sectors appear to be increasing their relative importance in domestic wood processing. Nevertheless, this should not mean that the needs of the pulp and paper industry can be forgotten. Despite the contraction in the sector, it will continue to be a significant player in Finland.

Role of research in development

Research and development work related to wood processing has received much attention in recent years. It has also been the object of more focused investment than previously. Examples include setting up of Forestcluster Ltd and Finnish Wood Research Oy. The specific purpose of these organs is to coordinate and finance development of new wood processing products. Through the above networks and with the help of public funding, the investments have mainly been targeted at technological and natural science research.

This is understandable considering the goal, i.e. development of new products. Products that may be commercially viable in a few years are already on the horizon, such as biofuels and chemicals based on synthetic gasification. Research will continue to play a crucial role in creating future opportunities for wood processing.

However, the importance of social research should not be forgotten in the development work. To date, such research has received too scant attention. The problem may lie in the fact that awareness of the importance of social research is still insufficient. Development over the last decade would indicate that this is the case.

Finnish globally operating forest companies were ill-informed and poorly prepared for the changes taking place in their operational environment, which in the 2000s have significantly altered the course of development in the pulp and paper industry. The paper and paperboard industry was particularly incapable of anticipating the structural change it was up against, brought about by electronic communications and globalisation. Nevertheless, research was already carried out in the late 1990s that clearly showed changes underway in consumer behaviour, and that electronic media had begun to displace paper use in the United States (e.g. Boston Consulting Group 1999, Hetemäki 1999). This trend was forecast to migrate also to Western Europe. At the same time, globalisation moved much of goods and packaging manufacture to countries with low production costs, which led to drying up of the growth in the consumption of paperboard and packaging paper in several industrial countries.

The lack of understanding of the changing operational environment and its impact on the consumption of paper products and price development, outlined above, led to misinvestments on a large scale in the American market. Moreover, it helped to delay the initiation of developing new products. Similarly, problems have in recent years been linked to investments in developing countries, when there has been insufficient understanding of the socio-economic and cultural dimensions of local conditions (e.g. South America, China).

The above examples indicate that socio-economic and independent research of the operational environment can help to mitigate surprises in long-term planning. It does not remove them completely, but it may help to understand them, and also reduce the related risks and costs. Investments in new wood processing products are undoubtedly also related to social dimensions that have not yet been sufficiently studied. For example, significant socio-economic and environmental issues are related to the development of forest biomass based energy production, both at home and globally.

Next, we outline an example of the potential role of research in enhancing the wood products industry prospects. Along with the climate change, the lifecycle greenhouse gas emission impacts of wood products and competing materials, such as cement, steel, aluminium and plastic, gain prominence. For the sake of mitigating climate change, emissions from production processes, and the ability to sequester carbon dioxide in the next 10-30 years, are particularly important. The wood products industry takes the view that it would do well in such comparisons. This is likely to be the case, but we cannot

know it with any certainty, because a sufficiently extensive, detailed and independent study on the issue has never been carried out. Over the years, there have been many case studies and regional studies, but the results cannot be generalized easily to larger context. Thus, there is lack of knowledge as to exactly what and how great the advantages of wood products would be in mitigating climate change *vis-à-vis* the competing materials.

The industries have themselves carried out or commissioned studies purporting to show the good qualities of their own sector's material from the climate change angle. However, the weight of such isolated studies and their impact in political decision-making and consumer choices is impaired by the fact that they are seen as lobbying by the industry that conducted or commissioned them. They are also often case studies, from which generalisation is questionable. Besides these studies, there is a need for comprehensive, independent and authoritative research that would take into account the suitability of different materials for different uses, endeavouring to combine materials and production techniques in an optimal way in terms of climate impacts. After all, it is often not a question of an either-or choice between materials, but an optimal combination of different materials, for example in building construction.

The work of the Intergovernmental Panel on Climate Change (IPCC) and the Stern Report are examples of how authoritative and independent studies and investigations can have a significant impact on politics, and through it, on markets. A comparative study of the climate change impacts of various materials in construction would also be a challenging task demanding wide-ranging expertise, albeit naturally not on the same scale as the above examples. The Finnish government could take the initiative in promoting and funding such work. Natural partners in this work would be Sweden, Canada and the United States, where wood products industry play a major role. However, in order to ensure credibility, it would be expedient to involve also countries where the wood product industry is not as crucial as it is for these countries. Potential organisations that could take initiation and coordination of such research forward would be e.g. the UN Environmental Programme (UNEP), World Wide Fund for Nature (WWF) and UN Food and Agriculture Organization (FAO). Admittedly, a problem with the last organisation could be that from the viewpoint of sectors competing with wood products, the organisation may become labelled as too biased towards the forest sector.

As a result of such research, the probably more favourable climate impacts of wood products compared with other materials could be realised in the markets as increased demand for wood products. Thus, this could be one method of increasing the use of coniferous sawn wood e.g. in Europe.

Wood products, energy and the environment as pillars of reform

Jouko Karvinen, CEO of Stora Enso, recently voiced a need for a national programme for saving the forest industry. The demand is understandable. He urged that the action should be very swift. Measures and working groups that only produce results in 2011 or after are of no help in his view.

In terms of preventing the immediate adverse effects of the economic slump, this is probably true. However, the structural problems of Finland's wood processing sector cannot be resolved at a quick pace. It requires thorough reassessment of policies, a more wide-ranging vision, and inclusion new parties, such as the energy industry, in the policy planning process. The ongoing structural change in forest industry also requires uniquely innovative and creative action in order to the sector survive and prosper in the future. It appears that the new and creative vision also has a better chance of success, if it is linked to wood products, energy and the environment.