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What is the current state of forest product markets and how will they develop in the future?

Ragnar Jonsson, Elias Hurmekoski, Lauri Hetemäki, Jeffrey Prestemon

3.9.1. Introduction

Forest-based industries – pulp and paper, solid wood products, and a number of downstream value-added wood-based manufacturers – have received limited attention in the pursuit of a successful implementation of EU and national bioeconomy strategies. According to Eurostat, the pulp and paper and solid wood products industries accounted for about 4.4% (€277 billion) of the production value and 5.4% (1.61 million) of total EU employment in manufacturing in 2013. The importance of the sector is far greater if one were to include forestry and logging and downstream wood-based industries (furniture, energy, chemicals, etc.).

The global and European forest-based industries are undergoing major structural changes (Hansen et al, 2013). Most notably, the consumption of graphic papers has been declining in most OECD countries and increasingly also in non-OECD countries, such as China, due to the increasing use of electronic media. Moreover, the consumption and production of wood-based products is increasingly shifting from the previously leading forest industry regions of North America, Western Europe, and Japan to the rapidly growing large economies of China, Brazil, and India. Furthermore, with emerging new biobased products, such as biofuels and bioplastics, the boundaries with other sectors, such as energy, chemical and textile industries, are expected to become increasingly blurred. These changes are producing a growing diversity and complexity in the forest sector, presenting what are likely to be ever greater economic and policymaking challenges in Europe and worldwide in the future.

The outlook for European forest-based industries depends on the perspective. In terms of market growth, looking only at large volume *traditional products* (sawn wood, wood-based panels, pulp and paper) may yield a different picture compared to one that considers also *new or emerging wood-based bioproducts*. The aim of this section is to assess ongoing trends and likely future developments of European forest-based products markets, considering the most recent research, expert assessments, and available data.

3.9.2. Large volume forest-based products

European forest-based industries have been facing major changes in the 2000s compared to the period 1960–2000, which was characterised by stable market growth for all large-volume forest products (Hetemäki and Hurmekoski, 2016). The trends from this century are likely to continue to shape the traditional forest-based industry over the next 10 to 15 years.

Economic globalisation has led to increased trade and a global market for wood-based products. Focal points of forest products manufacture have become progressively more spatially separated, with companies placing manufacturing plants at different geographic locations along the value chain from the forest to the consumer. Intensively managed forest plantations in the southern hemisphere are gradually replacing temperate and boreal forests as the predominant raw material resource for the manufacture of wood products, not least wood pulp, where production has increasingly been moved to Latin America. Furthermore, while demand for traditional forest-based products is growing quickly in China, India, and other developing countries – in line with their rapid growth in income – demographic and economic development is not supporting sustained growth in Europe. It should be noted that growth is higher in Eastern Europe than in Western Europe. Europe is a net exporter of most large volume forest-based products, and is expected to remain so in the medium term (UNECE/FAO, 2011).

The progress in digital information and communication technology (ICT) is having a negative impact on the demand for graphic paper (Pöyry, 2015). The decline of newsprint consumption started in the USA in the late 1980s, and the substitution impact of digital ICT has gradually spread to other graphics paper products and markets, including emerging economies such as China. Packaging and hygiene paper consumption, on the other hand, continues to increase in Europe and globally.

EU renewable energy targets continue to stimulate an increasing demand for energy wood, thereby also influencing the markets for many established forest-based products (Solberg et al, 2014). Bioenergy provides opportunities for new markets for forest and industrial residues and for post-consumer wood. Selling chips, sawdust, bark or pellets to energy firms provides income for the sawmill industry. Chemical pulp producers may also profit from growing bioenergy markets by producing bioenergy (heat, power, biofuels) as a side stream of the pulping process. On the other hand, particleboard and pulp and paper industries tend to suffer from the development of bioenergy markets, due to higher prices for wood raw material (Johnston et al, 2016; Jonsson and Rinaldi, 2017). This suggests a need for improved forest management to increase timber growth rates, advances in harvesting and technical efficiencies in manufacture, and acceleration in cascaded uses of woody biomass to avoid further crowding out of material uses by energy uses. There is still considerable uncertainty related to future EU climate and energy policies, though. A crucial consideration is to what extent, and in which form, the support for wood-based energy will continue. Moreover, there is uncertainty as to the extent and timing in the emergence of economically feasible alternative renewable energy technologies.

All in all, there are signs that economic development and demand for traditional, large-volume wood products in Europe has become decoupled from GDP growth, as is apparent from Fig. 15. The decoupling results from declining graphic paper markets due to digital ITC and stagnating solid wood products market as a consequence of demographic developments, while the climate and energy policy environment is favouring the use of wood fuels.

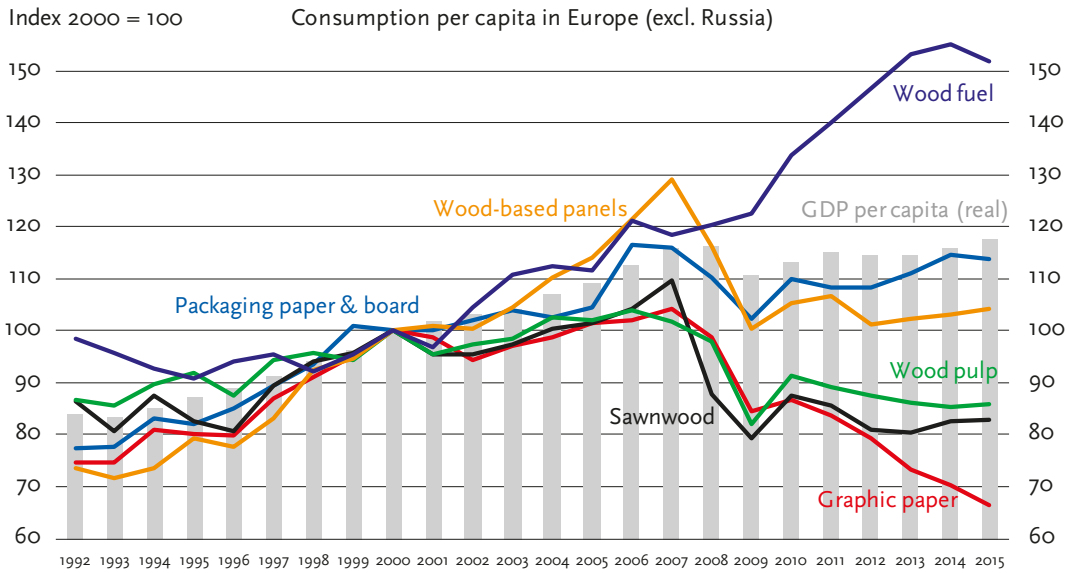

Figure 15. Consumption per capita of forest-based products and GDP growth in Europe (excluding Russia) (Data: FAOSTAT, World Bank).

3.9.3. New forest-based products

The concept of "new forest products" or "innovative bioproducts" has been increasingly on the policy and industry agenda in the 2000s (Philippidis et al, 2016; Cowie et al, 2014). There are two reasons for this. Firstly, there is a clear desire by policymakers and others to reduce the fossil fuel dependency of the global economy. Secondly, the forest industries seek to diversify their businesses, due to stagnant or declining markets for a number of traditional products. As there is no established definition for new products, it is useful to distinguish the following categories:

1. Old products with newly increasing demand due to changes in the operating environment. For example, dissolving pulp for the textile industry due to the need to find substitutes for cotton, as its production competes for land with food and feed production and consumes scarce water resources for irrigation.
2. Old products with incremental improvements, such as lighter weight or lower production costs. For example, paper and packaging coatings and fillers based on nanocellulose.
3. Novel products or products with radical improvements. For example, the use of nanoscale organic matter in electronics.

In the future, the relative importance of new products can be expected to grow further. It is conceivable that, beyond 2030, there will be a large number of product categories, none of which dominates the sector to the extent that paper and wood products did in the past century, particularly in terms of value (see Figure 16). However, currently it seems that there will be only a few individual product groups whose annual production volume in the EU will exceed one million metric tons or a million cubic meters per year by 2030, such as biofuels, dissolving pulp (for textiles, etc.), and engineered wood

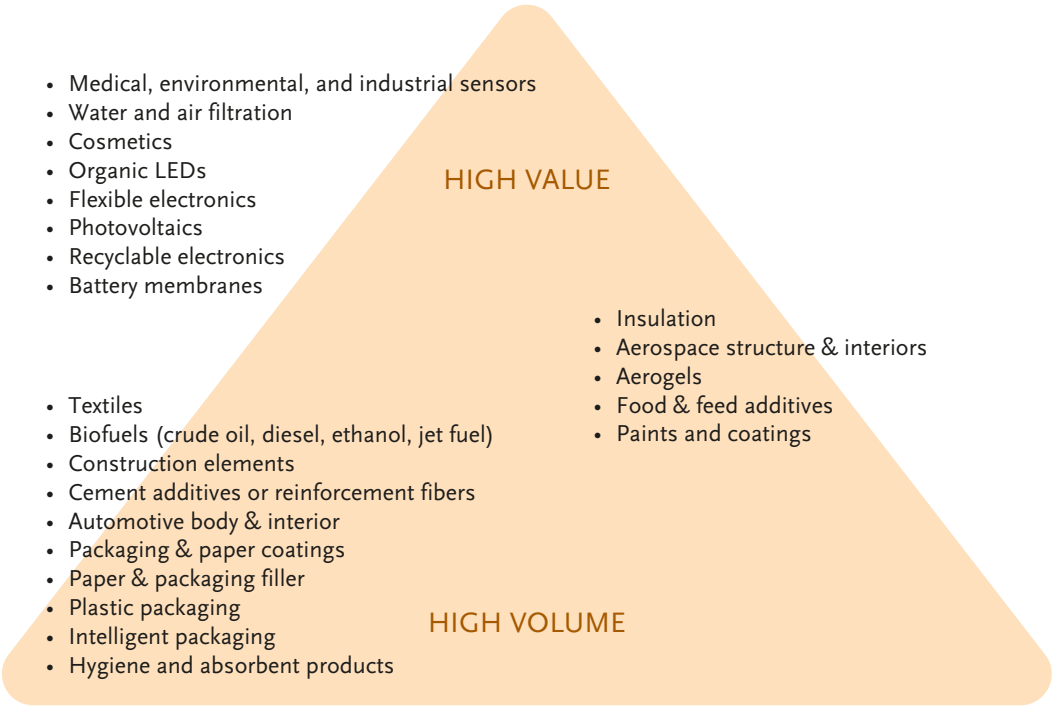

Figure 16. Examples of the possible end uses of new wood-based products (Cowie et al, 2014; Pöyry, 2016).

products (notably cross laminated timber). This would be in the face of around 105 Mm^3 sawn wood production and 37 Mt of pulp production in the EU in 2015.

The long-term outlook for other product categories appears more uncertain at the moment. For example, there is no policy pull for bioplastics like that experienced in biofuels, which is why the production of biofuels is expected to reach seven million metric tons in the EU by 2020, compared to less than one million metric tons of bioplastics (Pöyry, 2016). The majority of these volumes are based on agricultural feedstock, yet wood-based feedstock can be significant in regions with a high dependency on forest industry. Yet, the increasing political commitment for a circular economy (European Commission, 2015), and the problems caused by plastic waste (e.g. ocean pollution), may change this trend in the coming decades.

Although small in terms of volume, the new products are often expected to provide high value. The secondary wood products sector (joinery and carpentry, prefabricated wooden buildings, etc.) already exceeds the sawmilling sector in terms of production value in the EU, despite an estimated 10 times lower production volume. If forest biomass-based production was to capture only 1% market share of the global fuels and plastics markets, it would create new turnover of €40 billion for the forest-based sector (Pöyry, 2016). However, very little independent research exists to judge the likelihood or possible impacts of such developments, partly because data on the emerging products are elusive. Nonetheless, the unit value of biofuels or bioplastics is not necessarily high, compared to some of the established forest products, such as sanitary papers.

The interdependencies between forest product markets may play an even stronger role in the future, as the residues from the production of intermediate wood products (most notably sawn wood and pulp) account for a significant source of raw material for

the production of energy, wood-based panels, and chemicals that can substitute for oil-based products. For example, the global forest industry produces annually 50 million metric tons of lignin. In the absence of other uses, lignin is typically used directly for energy production; however, in the future it could be used for a various assortment of fuels, platform chemicals and plastics (Pöyry, 2016). The profits from current products may provide the funding for investments in new products, or the new products will help to sustain the production of established products, through improved utilisation of side-streams. For example, the profitability of sawn wood production is to some extent dependent on the ability to sell mill residues for energy production or wood-based panel manufacture. Furthermore, with shrinking demand for electricity in some regions, due to declining energy-intensive industrial activity and increasing energy-efficiency, investments in further processing of by-products into higher value-added products may guarantee the continued operation of sawmills.

The interdependencies may also pose challenges, such as in the case of increasing pulp production capacity in Finland and Sweden. Due to integrated pulpwood and log procurement – i.e. the important role of sawmills as suppliers of chips for pulping – the investments in pulp capacity also necessitate a major increase in sawmilling, yet the demand for sawn wood may not grow at the same pace as the demand for market pulp.

Take home messages:

- On a global level, continued growth in the production and consumption of forest-based products – with the exception of graphics paper that competes with electronic ICT – is expected. However, in the EU, sawn wood, pulp and paper markets are likely to experience stagnation until 2030, because of unfavourable demographic developments, slow economic growth, increasing global competition, and a number of market-specific drivers, notably progress in digital ICT.
- The outlook for the forest-based products sector in the EU contrasts with 20th century experiences, when production and consumption of all forest-based products followed economic development and population growth. The changing situation is due not only to the long-lasting economic downturn, but also the result of numerous structural changes.
- Global trends, notably demographic developments and progress in electronic ICT, will likely continue for many decades. The outlook for major forest-based product markets outlined above thus provides a reasonable baseline for future developments of the sector. However, there are a number of uncertainties around future developments.
- A prominent uncertainty concerns the evolution of climate and energy policies, as they have been shown to exert a strong influence on forest-based products markets.
- Yet another uncertainty regards growth prospects of emerging forest-based products. Even though they may not turn out to be very important in terms of volume, they may provide significant economic value by 2030.
- Finally, the trend analysis outlined above does not consider potential game changers or wild cards, such as technological breakthroughs or, for example, the introduction of a strong support scheme for negative emissions.
- Given the importance of global forest products markets to the economy, employment and forests, and the changes taking place in the markets, the overall scale of independent, transparent academic market research is alarmingly low. There is also a need to better connect market developments to wider sustainability concerns.

Policy recommendations:

- It is important to understand various interdependencies between material and energy uses of wood, as well as between existing and emerging markets. Policy decisions, particularly those directed at the scale and scope of renewable energy standards, targets and incentives, are likely to markedly influence future developments of traditional forest-based industries due to these various dependencies (synergies as well as competition) between forest products markets.
- To promote synergies and reduce as much as possible any undue crowding out of material uses of wood through lop-sided support to energy uses, measures to enhance material efficiency, such as cascading, should prove useful.
- Increasing diversity and complexity of forest products markets implies difficulties for monitoring the development of the sector. It also makes the design of regulation more complicated. Therefore, there is an increasing need for policy coordination across different policy sectors, as well as a long-term stable policy environment that helps to reduce uncertainties and, consequently, makes the investment environment more predictable.

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