

Opportunities for the wood sector?!

Bruno Andresons

Latvian State Institute of Wood Chemistry



Picture:

Photograf: Lone Ross Gobakken

Residential apartments in Stavanger Norway “Vannkanten”

As can be understood from the information available in the recent literature and documents, the European forest-based sector is ahead of the major challenges. Fundamental changes have already taken place in forest products markets, and they

may have still more significant structural changes in the coming two decades than they had during the whole 20th century. For example, some important forest products face mature or even declining markets, and at the same time we can see an increasing competition from emerging economies. On the other hand, forest products, which did not exist in the 20th century, are already in production now – not to speak of the possibilities in coming decades. Hence, the European forest-based sector should also become more diversified, interlinked and cross-sectorial. It is increasingly affected by issues such as climate change impacts and policies, energy policies, advances in new technologies, the increasing role of services, and trends towards a low carbon bioeconomy and a green economy. Furthermore, the forest sector is becoming more integrated with other industrial sectors, such as construction, energy, chemicals and textile industries. The concepts of ‘forest-based sector’ and ‘forest-based bioeconomy’ are beginning to replace the conventional and narrower concept of ‘forest sector’. This has not been sufficiently addressed by the sector – there are major issues needing urgent reassessment and research, as well as policy and stakeholders’ attention.

The forest based sector plays now and will play a very important role to reach this goal, at the same time being economically, environmentally and socially active. The term “sustainability” is progressively expanded to accept that forest management should not just focus on timber as a commercial product, but that it should aim at a broader provision of human-valued products and services. Reviewing a range of publications, it can be concluded that a full consensus has not been reached in the understanding of the meaning and application of various concepts and approaches.

The European Union Forest Strategy document (COM(2013) 659) determines that the cascade should meet the resource efficiency criteria, respectively, wood should be used in the following order of priority: wood-based products, extending of their service life, re-use, recycling, bioenergy or disposal. In some cases, for example, due to the changed environmental requirements, a different approach may be required.

One of the current trends is the growing use of wood in building and life environment. Since the use of wood in durable construction allows carbon to be stored over long periods, these uses should be stimulated. At the end of their life, the same wood can then be used for other (e.g. fibre) products and finally – for bioenergy. Such cascading use offers a mitigation potential and promotes greater circularity and the creation of added value. This approach accepts the growing interest in substitution of materials with a high carbon footprint (steel, concrete etc.) in the building sector and the urgent trend to build wooden high-rise buildings (up to 100 floors).

Sustainable economic development programmes, scenarios and objectives are being worked out not only up to 2030 but also up to 2050.

The scenarios highlight how, under a different possible and consistent scenario, the supply of and demand for biomass may develop. Evaluating the demand, a whole range of factors should be taken into account, including the impact of international

trade, the basic market and price mechanism, technological advances in biomass conversion, consumers' taste change, the changing global competitive advantages in product value chains and others.

Some authors analyse whether there is a conflict between biomass supply and demand. Analysing this issue, the possibility of the development of new materials based on waste materials from the industrial processing of renewable resources should be taken into account. The interest in production and use of alternative and renewable raw material sources is growing in the last few years. It is mainly waste material based on the industrial use of renewable resources that is of high interest due to the high volume and low market prices in this area.

The forest products sector has been dominated for over a century by the pulp and paper and wood products industries. In the coming two decades, it apparently will turn from a much focused sector into a much more diversified one and will increasingly merge with the construction, energy, chemicals and textile industries to become an essential part of the bioeconomy. When designing policies, we have to remember the regional diversity of the European forest-based sector, and the fact that it has significantly different roles and contributions in different countries.

If we look at the forest biomass cascade, in which high value compounds are at the top, but residual biomass for production of low value energy, electricity and heat at the bottom, we can see a wide range of work for wood science and engineering.

Taking into account the fact that wood resources are globally limited, a clear priority should be given to the use of wood as a material or raw material against the use as an energy source. This approach, without carbon sequestration, shall also provide added value and jobs.

By investing in research, "take-off" will be given for the further intersectorial development of the forest sector: the use of wood in the automobile industry, shipbuilding, car building, construction, production of construction materials, furniture making, etc.

A rational approach to the use of resources will favour their diversification, the coherence of the timber supply system with the regional accessibility of renewable raw materials, expanding the used renewable materials' volume and types by contributing to climate change reduction and also ensuring biodiversity.

Worldwide, a trend is observed to increasingly use natural materials, including wood products, in the living environment. This trend should be strengthened through popularising quality wood products with a high ecological value and the spread of the high added value in the local market, and the market's protection from wood products with inadequate quality should be promoted. The development of innovative products for applications in construction and the living environment (floor coverings, stair

elements, housing furniture, etc.) should be favoured. An increasing role belongs to informing the society - from professionals (architects, builders, project developers) to consumers - about the wood materials' benefits, compared to the similar functional materials' use in the national economy.

Research and innovative products' design embraces the enhancement of wood products' competitiveness, expands the market offerings with new products that meet the requirements of normative acts on construction safety and lifetime, and the highest ecological criteria, as well as will have attractive service properties and assessed life cycle assessment data.

To enhance the competitiveness with other materials, technologies for expansion of the wood products' range with innovative materials are under development. The most topical research directions include: ecological wood materials with low emissions of volatile organic compounds, high mechanical strength, durability, bio - and fire-resistance indices, defined service life; innovative hybrid materials from wood and recycled polymer materials with a wide range of applications in various sectors of the national economy (transport, the automobile industry, construction, etc.). A challenge for wood researchers is the wooden high-rise buildings' building trend, which will require innovative design and material solutions (including, for example, in relation to fire safety and maintenance).

Undoubtedly, more investment in research, development and education is needed. This is necessary for the sector to renew itself and be globally competitive.

A very important role, one might say – even the main one, in solving topical issues in the forest sector will be played by innovations, and the interest and engagement of industry. There are already good examples at both the national and European scale, e.g., *The Bio-based Industries Consortium (BIC)*. The BIC annual survey from early 2015 indicates that BIC members currently invest more than 2.1 billion EUR in bio-based industries, mainly demonstration projects or new flagships. Most of the short-term investments will take place in the lignocellulosic and forestry based value chains. BIC executive director Dirk Carrez mentioned in 2016: "*The commitment of the industry is there, and the new BBI public-private partnership certainly shows its first impact. Now politics has to follow and enable a swift transition from fossil to bio-based resources.*"

Literature:

Innovating for Sustainable Growth: A Bioeconomy for Europe. European Commission, Publications Office of the European Union, 2012, 60 pp.
file:///C:/Users/User/Downloads/KI3212262ENC_002.pdf

Nordic Bioeconomy 25 Cases for Sustainable Change. Nordic council of ministers. 2017. 76 pp. ISBN 978-92-893-4776-1 (PDF), <https://norden.diva-portal.org/smash/get/diva2:1065456/FULLTEXT01.pdf>

M. Pesonen, Global demand and supply drivers for wood based products. Symposium on Wood Products Industries in Future Bio-economy Business April 7-8, 2016, Sibelius Hall, Lahti, Finland.
<http://www.metla.fi/tapahtumat/2016/rdisymposium/Pesonen.pdf>.

E. Verkasalo, Summary. Symposium on Wood Products Industries in Future Bio-economy Business, April 7-8, 2016, Sibelius Hall, Lahti, Finland.
<http://www.metla.fi/tapahtumat/2016/rdisymposium/Verkasalo-summary.pdf>

Think forest, Future of the European Forest-Based Sector: Structural Changes Towards Bioeconomy. Lauri Hetemäki (editor) European Forest Institute, 2014.
http://www.efi.int/portal/virtual_library/publications/what_science_can_tell_us/6/

M. Carus, L. Dammer and R. Essel; Options for Designing a New Political Framework of the European Bio-based Economy; nova paper #6 on bio-based economy 2015-05; Nova Institute;2015, www.file:///C:/Users/User/Downloads/15-06-08-nova-paper6-Political-Framework-EU-Bioeconomie.pdf.

S. Piotrowski, M. Carus and R. Essel, Global bioeconomy in the conflict between biomass supply and demand, nova paper #7 on bio-based economy 2015-09; Nova Institute;2015, www. <http://news.bio-based.eu/global-bioeconomy-in-the-conflict-between-biomass-supply-and-demand/>

Building up biomaterials: Michigan Tech researchers lead Forest Bioeconomy Conference Michigan Technological University; public release: 1-feb-2017;
www.eurekalert.org/pub_releases/2017-02/mtu-bub_1020117.php

Bio-based industries consortium, Annual report 2015;
http://biconsortium.eu/sites/biconsortium.eu/files/documents/BIC_Annual-Report_2015_web.pdf