European Commission

Some aspects of the forest-based bioeconomy in the BIOEAST region

Research brief

HIGHLIGHTS

- **The forest-based bioeconomy of the BIOEAST region has a strong resource base**
- **Harvesting intensity has increased along the time series analysed (2000 to 2015)**
- **Forest industry use of wood in the BIOEAST region has grown much faster than that for the EU as a whole in the period analysed (2009 to 2015)**
- **Energy use of wood in the BIOEAST region has grown slower than that for the whole of EU**
- **The BIOEAST region is a net-exporter of all wood-based products but pulp and paper**
- **Net-exports of wood pellets in particular have been growing strongly**

This brief focuses on the forest-based bioeconomy in the BIOEAST region, referred here as the EU region comprising the countries participating to the BIOEAST initiative[1]: Czech Republic, Hungary, Poland, Slovakia, Bulgaria, Romania, Slovenia, Croatia, Lithuania, Latvia and Estonia (Figure 1). Data are presented for the BIOEAST region as a whole, however, though sharing many features, in some respects there are also significant differences among countries.

Forests in the BIOEAST region

Forests in the BIOEAST region cover an area of 37.8 million hectares (Mha), i.e. 34% of the total land surface (Forest Europe, 2015). Of this area, 30.1 Mha are considered as forests available for wood supply (FAWS), see Figure 1.

Forest cover in the BIOEAST region is about 23% of the EU total forest area (161 Mha in 2015). However, the growing stock (stem

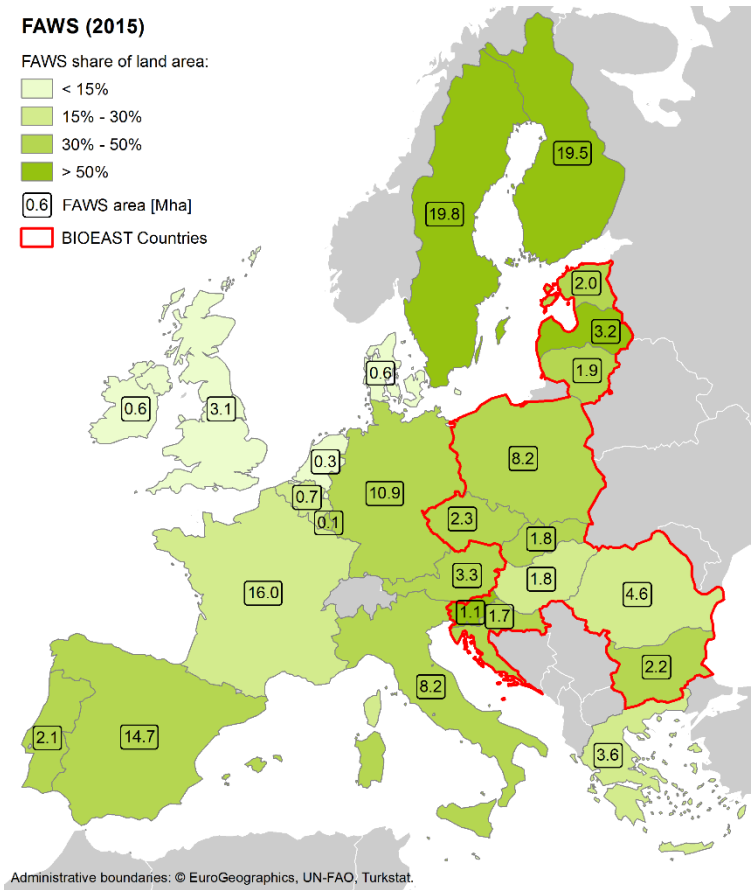

Figure 1: Forest available for wood supply (FAWS) area in EU countries (numbers) and share of FAWS with respect to land area (colour scale).

[1] http://www.bioeast.eu/

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and main branches) is about 31% of the EU total (Figure 2). Indeed, according to JRC estimates[2], the growing stock volume per hectare within this area, equal to 221 m^3 ha^{-1} in 2015, is about 33% higher than the average volume estimated at EU level (165 m^3 ha^{-1} in 2015) and, as highlighted in Figure 3 from 2000 to 2015 this amount was growing at a higher rate than the EU average.

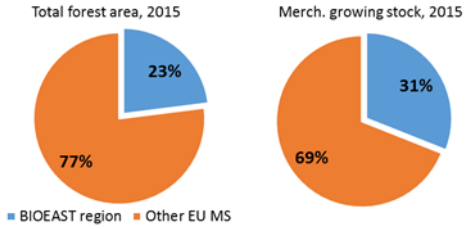

Figure 2: Share of forest area and merchantable growing stock (stem and main branches) in the BIOEAST region and in the rest of EU countries.

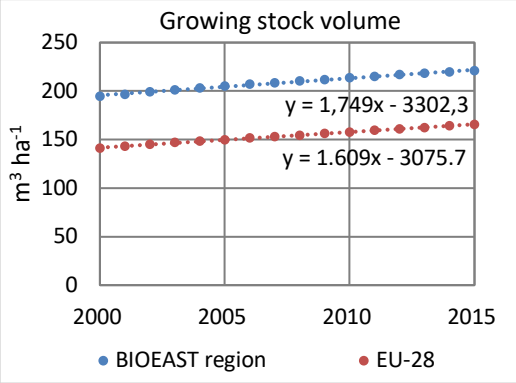

Figure 3: Growing stock volume per ha (stem and main branches) estimated at EU level and for the BIOEAST region. The slope coefficient of the trend lines associated to these data series (see the equations reported on the chart) is significantly different, equal to 1.749±0.066 for BIOEAST countries and 1.609±0.034 at EU level.

For the period 2000–2015, the net annual increment (NAI), i.e. the wood produced in forests annually minus losses due to natural mortality of trees, was on average 7.0 m^3 ha^{-1} yr^{-1} and 6.2 m^3 ha^{-1} yr^{-1}, for the BIOEAST region and at EU level respectively (Figure 4). Within the same period, in the BIOEAST region, fellings increased from 3.8 in 2000 to 4.8 m^3 ha^{-1} yr^{-1} in 2015 (i.e., from 54% to 69% of the NAI). At EU level, this amount increased from 3.5 in 2000 to 4.0 m^3 ha^{-1} yr^{-1} in 2015 (i.e., from 57% to 64% of the NAI).

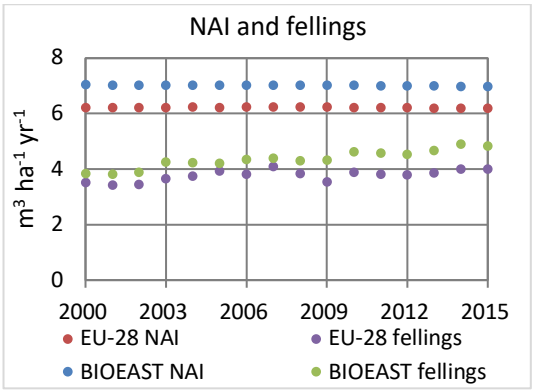

Figure 4: Net annual increment (NAI, including stem, branches, top and stump) and average fellings per hectare (including primary residues) at EU level and for the BIOEAST region.

Overall, this analysis suggests that both the biomass stock and the NAI within the BIOEAST region, are higher than the EU averages. This is probably due to the effect of past management practices, traditionally more intensive in western EU countries, where the forest composition was modified too, increasing the presence of conifers at the expenses of broadleaves. On the opposite, the relative lower intensity of past management practices (if compared to the NAI), detected within BIOEAST countries, led to an increasing biomass stock, and, probably, on average, to the current presence of relative older forests. Interestingly, the NAI estimated by this preliminary analysis is still higher than the average of EU, despite an increasing relative amount of felling that, during the last years, is higher than the average of the EU countries.

Importance of sawmilling and cascade use of wood for wood products manufacturing and energy

Looking at reported woody biomass flows in the BIOEAST region (Figure 5), the importance of the sawmill industry is clearly visible. Hence, sawmilling is both the largest industry user of wood and the main supplier of by-products, used by the panel and pulp industries as well as for energy.

[2] Details on methods and data sources used for this brief can be found in Camia et al. 2018.

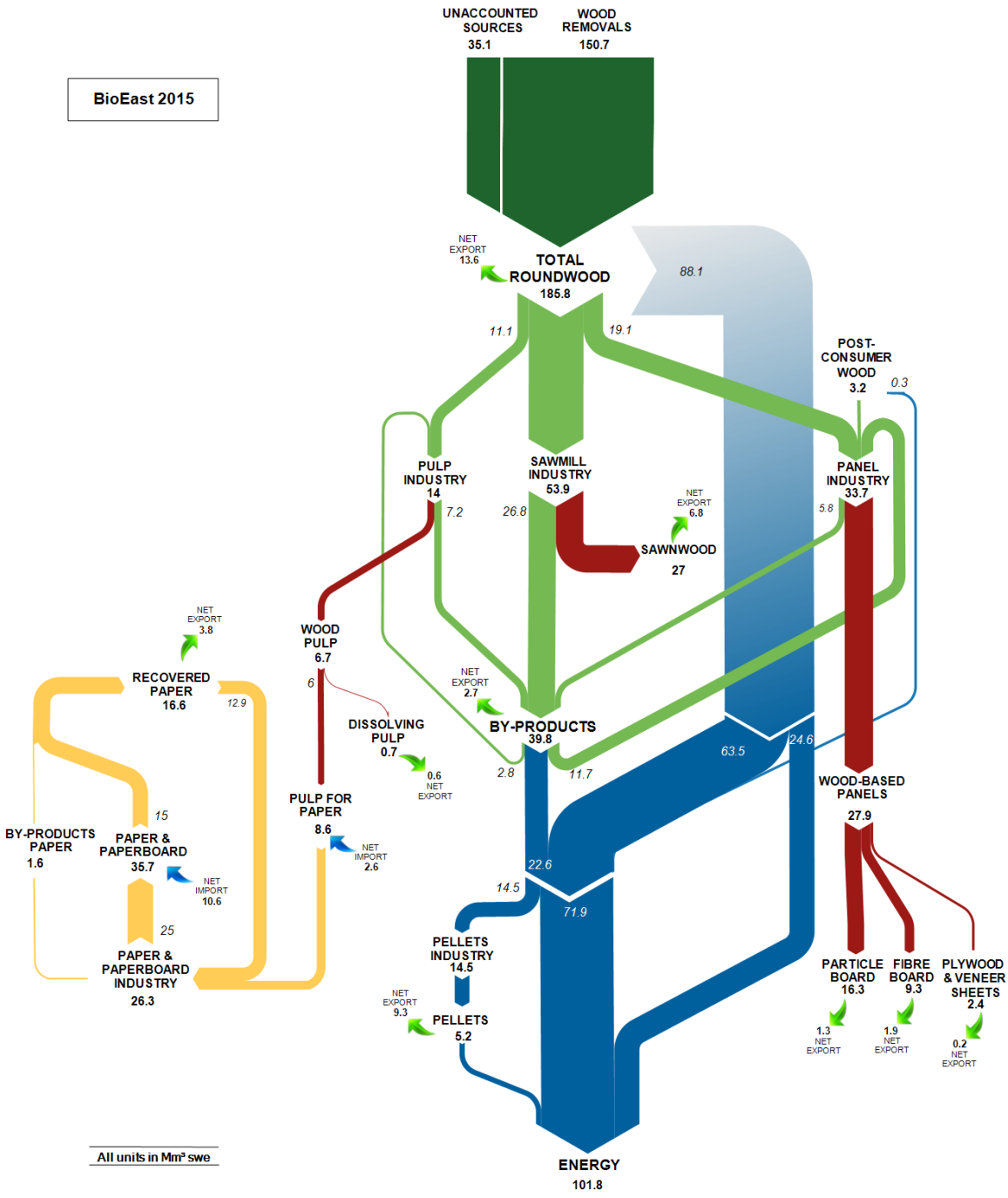

Figure 5: Woody biomass flows in the BIOEAST region for 2015, in million m³ (Mm³) Solid Wood Equivalents (SWE).

The cascade use of woody biomass is evident. Thus, the panel industry is to a considerable extent (44%) based on secondary wood fibres (by-products and post-consumer wood), while by-products account for one fifth of the woody biomass used in pulp manufacturing. Of the woody biomass used for energy, by-products, wood pellets and post-consumer wood account for 13%. In the case of paper and board, the circularity is apparent. Hence, recovered paper account for 49% of the input mix.

Material uses of wood in the BIOEAST region grew at a rate nearly four times as high as that for the EU as a whole, while energy uses grew 30% slower

For the EU as a whole, energy uses of wood strongly outgrew material uses between 2009 and 2015—growth of 34% and 9% respectively. By 2015, energy uses accounted for 41%, compared to 36% in 2009 (Figure 6).

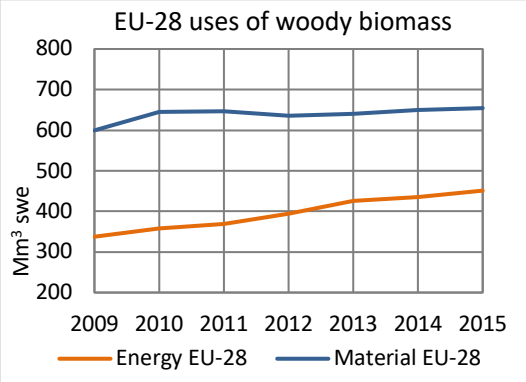

Figure 6: Uses of woody biomass for energy and material from 2009 to 2015 for the whole EU.

In the BIOEAST region, accounting for one fifth of total uses of wood in the EU-28 in 2015, the picture is different: material uses of wood grew 34% between 2009 and 2015, while the use of wood for energy grew 24%. As a result, the share of material uses increased from 52% to 55% between 2009 and 2015 (Figure 7).

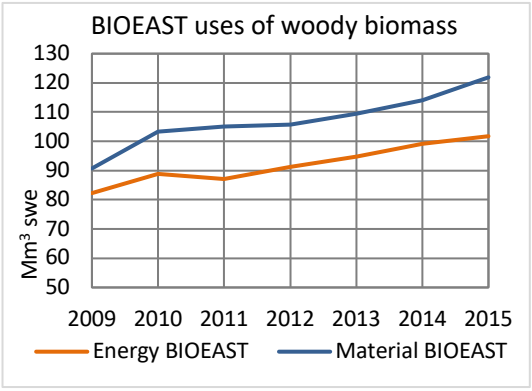

Figure 7: Uses of woody biomass for energy and material from 2009 to 2015 for the BOEAST region.

Wood use in solid wood products manufacturing outgrew that of pulp and paper in the BIOEAST region as well as in the EU-28

The rather slow growth of material uses of wood in the EU as a whole is due to the large share of the pulp and paper industry (53% of total material use of wood in 2015), which only grew some 5% from 2009 to 2015. This sluggish growth is largely a result of decreasing demand for graphic papers, increasingly replaced by electronic ICT. Sawmill use of wood grew with about 16%, and the panel industry with some 10 percent during the same period (Figure 8).

In the BIOEAST region (Figure 9), the pulp and paper industry accounted for only 28% of material uses of wood by 2015, a share that decreased from 31% in 2009. This as an effect of slower growth (24% from 2009 to 2015) as compared to the sawmill industry (36%) and, above all, the panel industry (45%).

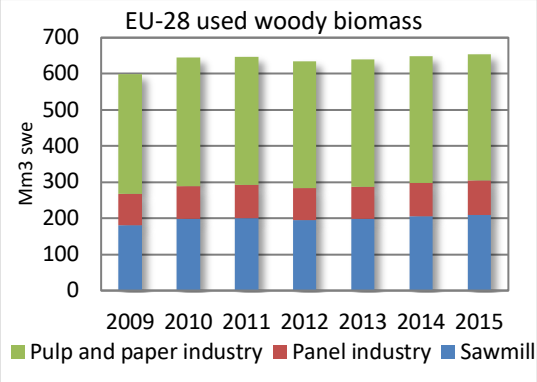

Figure 8: Wood uses in solid wood products for the EU-28, 2009-2015.

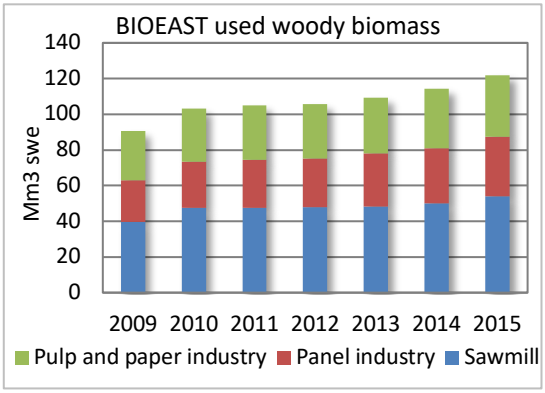

Figure 9: Wood uses in solid wood products for the BIOEAST region, 2009-2015.

The BIOEAST region is a net exporter of all wood-based products but pulp and paper

The BIOEAST region is a net exporter (negative values in Figure 10) of all wood-based commodities, with the exception of pulp and paper. The most visible trends are increasing net imports of pulp and paper and increasing net exports of wood pellets.

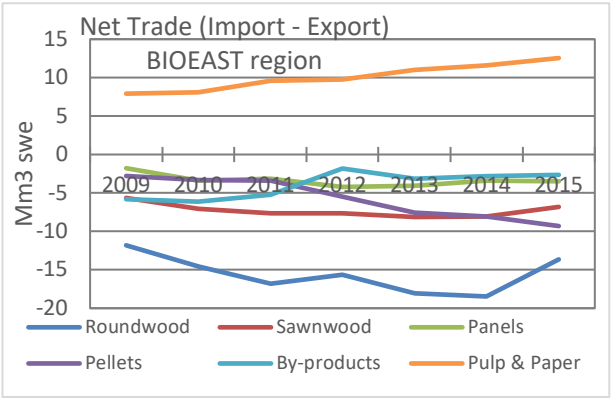

Figure 10: Net trade (Import-Export) in the BIOEAST region, 2009-2015.

Data sources

The forest biomass production figures were derived from National Forest Inventories (NFI), whose cooperation is essential for the JRC to derive harmonised biomass estimates. Since NFI results are produced according to national definitions (not always corresponding to the international agreed ones) and for different years, data were also processed by JRC using models and correction factors to estimate the biomass according to international definitions. As a result, the estimates may differ from national statistics. The analysis of woody biomass uses and flows in the forest-based sector, relied on data sources such as the Eurostat/UNECE/FAO/ITTO Joint Forest Sector Questionnaire (JFSQ), the UNECE/FAO Joint Wood Energy Enquiry (JWEE) and the JRC National Renewable Action Plans (NREAPs) and Progress Reports Data Portal.

References and further literature

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