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Forest Products

Annual Market Review 2020-2021



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ABSTRACT

The *Forest Products Annual Market Review 2020-2021* provides a comprehensive analysis of markets in the UNECE region and reports on the main market influences beyond the region. It covers products from the forest to the end user and from roundwood and primary processed products to value-added, housing and wood energy. Statistics-based chapters analyse the markets for wood raw materials, sawnwood, wood-based panels, paper, paperboard and woodpulp. Underlying the analysis is a comprehensive collection of data. The *Review* highlights the role of sustainable forest products in international markets, discusses policies concerning forests and forest products, assesses the main trends and drivers, and analyses the effects of the current economic situation on forest product markets.

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FOREWORD

The COVID-19 pandemic brought great uncertainty to forest product markets in the UNECE region in 2020, and both production and consumption were subject to rapid and extreme fluctuations. By the end of the year, however, there had been only a slight overall contraction in the sector, which turned out to be an above-average performer compared with other economic segments. This good news for forest products has continued into 2021.

Another encouraging development in 2020 was the opportunity for people to gain a greater appreciation of forests and their diverse roles and benefits. With widespread lockdowns in the UNECE region and the temporary closure of many urban facilities, people spent much more time than usual in their nearby forests and woodlands. For many, experiencing nature and rediscovering forests and their possibilities has been one of the most positive effects of the pandemic.

Forests are both a source of well-being and a provider of livelihoods, and the forest sector continues to sustainably manage and harvest its resource across the UNECE region. Most forestry operations in the region strike a daily balance between economic, social and environmental demands to ensure maximum benefits for society and minimum impacts on forest ecosystems. Thus, the UNECE region is the world leader – by far – in the area of forests certified as sustainably managed.

Pandemic-related lockdown measures meant that people spent less money on travel and leisure activities and therefore had more money at their disposal. Many took the opportunity for do-it-yourself remodelling and repairs in their homes, including home offices, and the construction sector also performed strongly. Demand for wood products, therefore, recovered quickly after the first quarter of 2020, particularly for sawnwood and structural panels, and increasingly exceeded supply.

The positive upward trajectory continued into 2021, with higher-than-expected demand. This, paired with depleted inventories and a slow supply, led to higher prices, including record highs for certain types of panels and for sawn softwood. The upward price rise had come to an end by mid-2021, however.

As reported in this edition of the *Forest Products Annual Market Review*, innovative and future-oriented wood products are emerging and gaining traction in the region, from wood-based fibres for sustainable clothing to new building materials, such as cross-laminated timber. Nevertheless, the potential of such products remains barely tapped.

The *Review* assesses the extraordinary movements in forest product markets in 2020 – the turbulent first year of the COVID-19 pandemic – and the first half of 2021. Now, as the world adjusts to the pandemic and forest product markets and outlets stabilize, the opportunity exists to place much more emphasis on the forest sector as a means for building back better – and greener.

The *Review* provides important information for assessing progress towards the achievement of several of the UN's Sustainable Development Goals, including goals 15, "life on land" (chapter 2); 12, "responsible consumption and production" (all chapters but particularly chapter 5); 7, "affordable and clean energy" (chapter 6); and 13, "climate action" (all chapters).

As always, the *Review* has benefited from the inputs of a group of leading experts and authors, who combined their own market intelligence and knowledge with data gathered by the UNECE and FAO. We thank them all.

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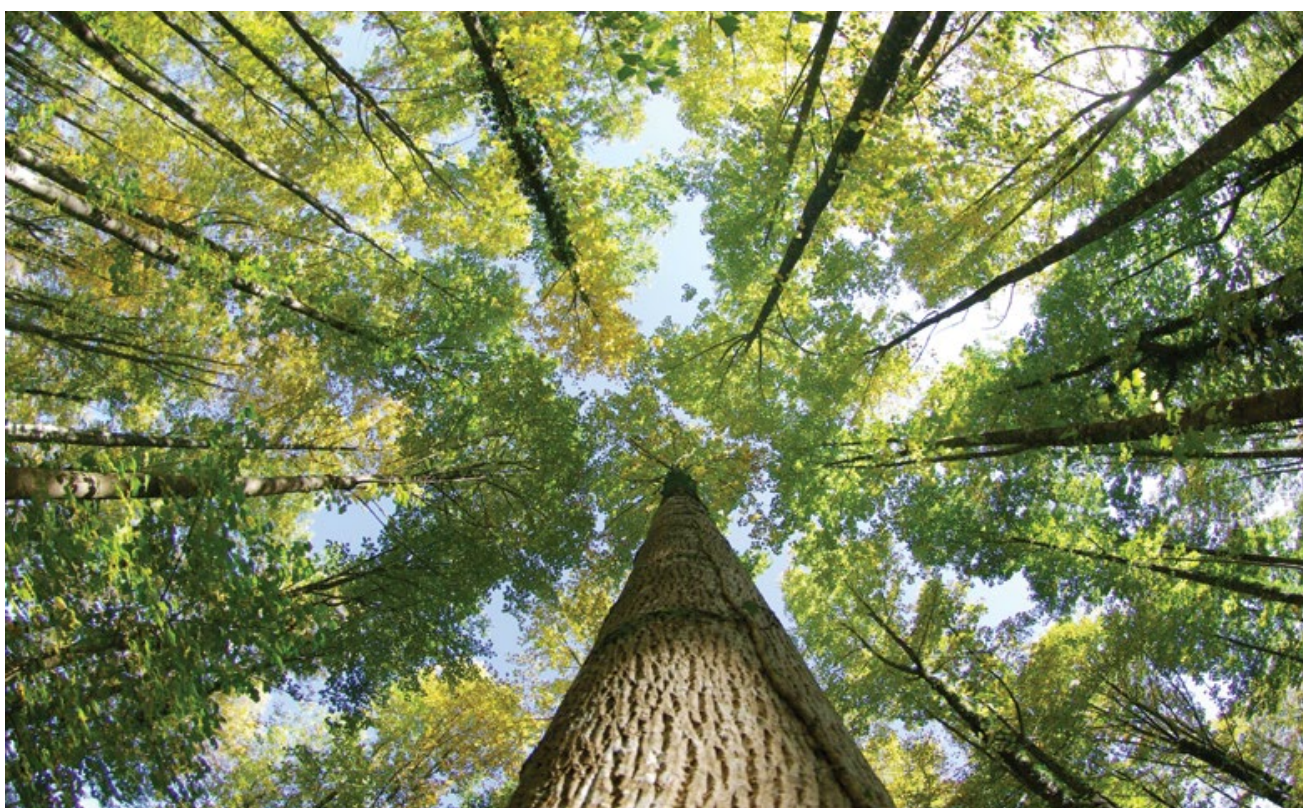
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DATA SOURCES

The statistical correspondents mentioned on the previous page supplied the data and statistics for this publication, which can be found in the UNECE/FAO timber database. In those cases where there is no official source of information, numbers are based on author estimates; information from trade journals and research papers; data from the Committee on Forests and the Forest Industry Timber Forecast Questionnaire; and information from the United Nations trade database, Comtrade.

EXPLANATORY NOTES

“Apparent consumption” is calculated by adding imports to a country’s production and subtracting exports. Apparent consumption volumes are not adjusted for levels of stock. “Apparent consumption” is synonymous with “demand” and “use” and is often referred to as “consumption”. Consumption is the sum of a country’s (or subregion’s) production, imports and exports.

For ease of reading, the publication mostly provides value data in United States dollars (indicated by the sign “\$” or as “dollars”). Unless specific for a given period, the applied exchange rate for the euro in 2020 is €0.8775 = \$1 and for the Russian rouble is RUB 72.11 = \$1. Both these exchange rates are based on the annual average rate provided by the UNECE (<http://w3.unece.org/PXWeb/en>).

Trade data for the 27 European Union (EU) countries include intra-EU trade, which is often estimated by the countries themselves. Export data usually include re-exports. Subregional trade aggregates in tables include trade occurring between countries in the subregion. Declared unit values shown in tables and graphs are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by the volume of these products.

Forecasts for 2021 and 2022 in this publication are based on the implied rate of change for 2020 to 2021 and 2022 from forecasts submitted by member States before the November 2021 Joint Session of the UNECE Committee on Forest and the Forest Industry and the FAO European Forestry Commission.

See the map in the annex for a breakdown of the region into its subregions. References to EU27 refer collectively to the 27 country members of the European Union. The term Eastern Europe, Caucasus and Central Asia (EECCA) is used for reasons of geographic proximity and similarities in economic structure and refers collectively to 12 countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. It is used solely for the reader’s convenience.

The term industrial roundwood is used interchangeably with logs. The term softwood is used synonymously with coniferous. Hardwood is used synonymously with non-coniferous and broadleaved. Lumber is used synonymously with sawnwood.

All references to tonnes in this text represent the metric unit of 1,000 kilograms unless otherwise indicated.

A billion refers to a thousand million (10^9). One trillion refers to one million million, or 10^{12} .

All volumes of United States and Canadian sawn softwood production and trade are given in actual m^3 , converted from nominal m^3 .

All data and statistics in this publication are derived from the UNECE/FAO timber database unless otherwise noted. Tables based on the database are available in the statistical annex at www.unece.org/forests/fpamr2021-annex.

Please note that the *Review* publication is published annually, and the latest version and its references should be preferred. The references, while being an integral part of the publication, have been made available exclusively online under the links indicated in the References at the back of the publication.

ACRONYMS, ABBREVIATIONS AND SYMBOLS

(Infrequently used abbreviations spelled out in the text may not be listed again here)

| | |
|----------|--|
| ... | unavailable |
| \$ | United States dollar(s) unless otherwise specified |
| € | euro(s) |
| APA | The Engineered Wood Association |
| APHIS | The United States Department of Agriculture's Animal and Plant Health Inspection Service |
| BIS | Bank of International Settlements |
| BJC | builders' joinery and carpentry |
| C&F | cost and freight (Incoterm) |
| CEPI | Confederation of European Paper Industries |
| CLT | cross-laminated timber |
| COVID-19 | coronavirus disease of 2019 |
| CSIL | Centre for Industrial Studies |
| EECCA | Eastern Europe, Caucasus and Central Asia ¹ |
| EIA | Energy Information Administration |
| EPF | European Panel Federation |
| EU | European Union |
| EWP | engineered wood product |
| FOB | free on board (Incoterm) |
| FSC | Forest Stewardship Council |
| GDP | gross domestic product |
| ha | hectare(s) |

| | |
|----------------|---|
| HDF | high-density fibreboard |
| IMF | International Monetary Fund |
| ITTO | International Tropical Timber Organization |
| LVL | laminated veneer lumber |
| m ² | square metre(s) |
| m ³ | cubic metre(s) |
| Mbf | million board feet |
| MDF | medium-density fibreboard |
| MW | megawatt(s) |
| NEPA | National Environmental Policy Act |
| PEFC | Programme for the Endorsement of Forest Certification |
| SFI | Sustainable Forestry Initiative |
| SPF | spruce-pine-fir assortment |
| TDM | Trade Data Monitor |
| USDA | United States Department of Agriculture |
| USFS | United States Forest Service |
| USITC | United States International Trade Commission |
| USMCA | United States–Mexico–Canada Agreement |
| WRI | Wood Resources International |
| WTO | World Trade Organization |

¹ The acronym EECCA replaces the name of the UN subregion formerly known as the Commonwealth of Independent States and comprises the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.





Chapter 1

ECONOMIC OVERVIEW
AND POLICIES

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Introduction and UNECE region overview

The COVID-19 pandemic resulted in a large contraction in economic activity across the UNECE region in 2020, albeit with differences between countries due to the diversity of economic structures and policy responses. Output bounced back strongly in late 2020, and global merchandise trade rose to exceed pre-pandemic levels.

The economic outlook has brightened considerably in 2021, and rapid recovery and growth can be expected. Pent-up consumer demand is set to be released, and fiscal and monetary policies to support economic activity are likely to continue in most countries in the region.

Investor interest in the residential sector has increased, with a survey in the Euroconstruct region finding that 68% of repurposed buildings were converted to residential in 2020. This sector's subsectors are seen to have solid demographic demand, and residential real estate fits within many environmental, social and corporate governance plans.

Total housing starts in the United States was estimated at 1.38 million in 2020, an increase of 6.9% over 2019 and higher than the historical average of 1.01 million units. Total Canadian housing starts increased by 3.8% in 2020, year-on-year. About 57% of the total in Canada were apartments.

The new European Union (EU) Reconstruction Plan is anchored in the European Green Deal. Through its links to the EU's Biodiversity Strategy and Climate Policy, the strategy is expected to have a medium- and long-term influence on forest product markets.

Although the forest products' industry in Eastern Europe, Caucasus and Central Asia (EECCA) was not one of the most affected sectors in the early stages of the pandemic, it did encounter significant reductions in the production, trade and consumption of wood products. The furniture and wood-based panels segments experienced the biggest declines.

Port closures reduced exports of wood-based products from the United States by 32% in 2020 compared with 2019, and the country's imports dropped by 26%. Exports of wood-based products in March 2021 were, however, nearly identical to those in March 2020, and imports were about 36% higher.

The area of certified forests worldwide increased by 0.8% (3.5 million ha) between mid-2019 and mid-2020. The two major schemes reported a combined total of 530 million ha of certified forest, or 435.5 million ha after accounting for double-certification (i.e. forest areas certified by both schemes).

The 2021 edition of the UNECE/FAO *Forest Products Annual Market Review* provides a statistical review of market developments in the UNECE region in 2020 and the first half of 2021 and the policies driving those developments. The *Review* also includes forecasts for 2021 and 2022. The UNECE region has three subregions: Europe; the EECCA; and North America. It encompasses about 1.7 billion ha of forest, which is more than 40% of the world's total forest area.

The *Review* presents the best available annual statistics for 2020-2021 collected by the Joint UNECE/FAO Forestry and Timber Section from official national statistical correspondents, expert estimates and published information.

The trends discussed in this publication comprise a mix of data from the UNECE/FAO TIMBER database (presented for the UNECE region as a whole and for each of the three subregions) and information from other cited sources. The *Review* also includes information on other markets with influence on the UNECE region.

References to "Europe", "EECCA" and "North America" in this publication always pertain to the standard subregions (see the map, "Countries in the UNECE region, and its subregions", in the annex of this publication). The electronic annexes provide additional statistical information, and the full UNECE/FAO database is available on the web.

The subchapters on economic developments, and construction and housing, describe the broad macro-economic situation affecting demand in the UNECE region. In this chapter, the subchapters on policy and regulatory developments and forest certification address other factors affecting forests and forest product markets in the region in 2020 and beyond.

Economic developments and the pandemic response in the UNECE region

The COVID-19 pandemic resulted in a large contraction in economic activity across the UNECE region in 2020, albeit with differences between countries due to the diversity of economic structures and policy responses. Services suffered most because of mobility restrictions and changes in consumer behaviour, and the industrial sector fared comparatively better. Output bounced back strongly in the third quarter of 2020 as constraints eased. Although new COVID-19 outbreaks required the re-introduction of restrictions in some countries, the negative impact of these was more limited than during the first wave, and economies proved increasingly able to adapt to the limitations.

The external environment also improved as global merchandise trade rose to exceed pre-pandemic levels in late 2020. In the United States, a large fiscal stimulus and an

acceleration of vaccination rates provided significant impetus to growth in early 2021. After a sharp decline in output, recovery in the EU was more tentative, reflecting disruptions from new COVID-19 outbreaks. The constraining effect of restrictions hit Europe's service sectors, particularly tourism and hospitality, which are significant in many countries. The output decline in the Russian Federation in 2020 was relatively small, given the absence there of generalized lockdown measures.

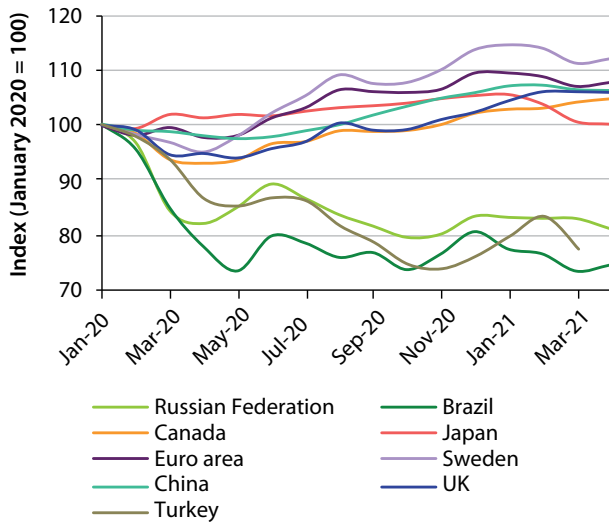
The overall contraction of economic activity in the UNECE region had a differentiated impact on labour markets. In the United States, unemployment soared, reaching 14.8% in May 2020, up from 3.5% in February, and the participation rate plummeted to 60.2% in April 2020, down from 63.3% in February. These trends reversed in the last quarter of 2020, however, with the unemployment rate more than halving from its recent peak. Nevertheless, the impact on employment remains significant. In the EU, labour-retention schemes and wage subsidies mitigated the worst effects of the crisis on unemployment. The pandemic disrupted cross-border labour flows, resulting in depressed incomes in countries where remittances from migrant labour are significant. Looking ahead, strong growth will reduce unemployment further across the UNECE region in 2022, although labour shortages could arise in some areas, given expected sectoral shifts.

Monetary policy loosened across the region. The United States Federal Reserve cut its target for the federal funds rate by 1.5 percentage points in 2020, bringing the lower bound to zero. Action included resumed quantitative easing, resulting in the rapid growth of the Federal Reserve's balance sheet. Forward guidance indicated that rates will remain low for some time – until inflation is on track to moderately exceed 2%. In the euro area, the European Central Bank launched a new asset purchase programme and reaffirmed its commitment to maintaining favourable financing conditions well beyond the end of the pandemic. In contrast, some EECCA economies started in 2021 to reverse the policy-loosening that marked the initial stages of the crisis.

Consumer price growth slowed through 2020, leading to temporary deflation in the euro area. Strong inflationary pressure has re-emerged recently, however, due to cost pressures driven by higher commodity prices, supply disruptions and increasing demand. In some EECCA countries, the depreciation of national currencies has added to inflationary pressures. Spare capacity suggests that the acceleration of inflation may be transitory, boosted by base effects and temporary supply bottlenecks. Monetary authorities in more advanced economies continue to underline their commitment to expansionary policies, but concerns about possible future inflation dynamics are starting to be reflected in financial markets.

GRAPH 1.1

Major currencies used to trade forest products, indexed against the US dollar, January 2020-April 2021



Note: A diminishing index value indicates a weakening of the currency value against the US dollar; an increasing index value indicates a strengthening of the currency value against the US dollar.

Source: IMF, 2021.

The US dollar weakened against the euro through 2020, strengthened in early 2021 and weakened again. These movements, which put an end to a two-year trend in which the US dollar generally strengthened against the euro, can be explained by narrowing interest-rate differentials arising from the United States' expansive monetary policy and improved market sentiment about the euro area's economic performance. The US dollar has also been weakening on a trade-weighted basis since the second quarter of 2020 (graph 1.1).

The economic outlook has brightened considerably in the UNECE region in 2021, and rapid recovery and growth is expected. The gradual easing of restrictions in all sectors, paired with more social interaction and an improving outlook, is expected to release pent-up consumer demand. Fiscal and monetary policies to support economic activity are likely to continue for some time in most countries in the region. Concerns remain, however, including the slow pace of vaccination in some countries, which will limit the general elimination of restrictions and facilitate the spread of new COVID-19 variants. Moreover, as the economic recovery advances, exiting from ultra-loose fiscal and monetary policies could become challenging in terms of timing, the ability of some businesses to adapt to new conditions, and impacts on financial markets. Although the general economic outlook for the next few years is positive, the pandemic has exposed

existing fragilities across the region, and recovery is expected to be uneven.

Construction in the UNECE region, with a focus on housing

Housing construction and sales as well as residential markets in the UNECE region varied at a frenetic pace in 2020. In the EU, construction activity plummeted in the first quarter due to lockdowns in many countries. Although activity bounced back strongly in the second quarter of 2020, it remained well below pre-pandemic levels, as of early 2021. In the Russian Federation, added-value in the construction sector was flat in 2020, recovering from midyear falls. In the United States, residential investment rose in 2020 after two years of contraction, with strong growth in the second half of the year offsetting earlier declines.

In 2020, housing prices generally performed better than economies in most countries in the UNECE region. In the EU, house-price increases were significant in many countries but unchanged in others. In the Russian Federation, growth in house prices, which gathered speed throughout the year, was facilitated by an expansion of housing loans. Price growth also accelerated in the United States in the second half of 2020, supported by eased access to finance.

Economic projections and house-price analysis provide insights into the housing construction, sales and remodelling markets and subsequently into wood product demand. The Bank of International Settlements (BIS) reported that residential house prices increased by 4.0% globally in 2020, year-on-year, by 10.7% in Canada, by 6.1% in the euro area, by 9.1% in the Russian Federation and by 7.8% in the United States. According to BIS, real residential prices (adjusted for inflation) are about 20% higher now than the average reported immediately after the global financial crisis in 2007-2009 (BIS, 2021).

■ EUROPE

Residential output and remodelling construction were greatly constrained in the Euroconstruct region in 2020.² Construction volume decreased by 7.0% and remodelling was down by 2.9% (Euroconstruct, 2021). European housing markets improved in the first quarter of 2021, however, and housing investment is expected to show a positive trend to 2023 (table 1.1).

² The Euroconstruct region comprises 19 countries: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

TABLE 1.1
Construction spending forecast, Euroconstruct region, 2021-2023

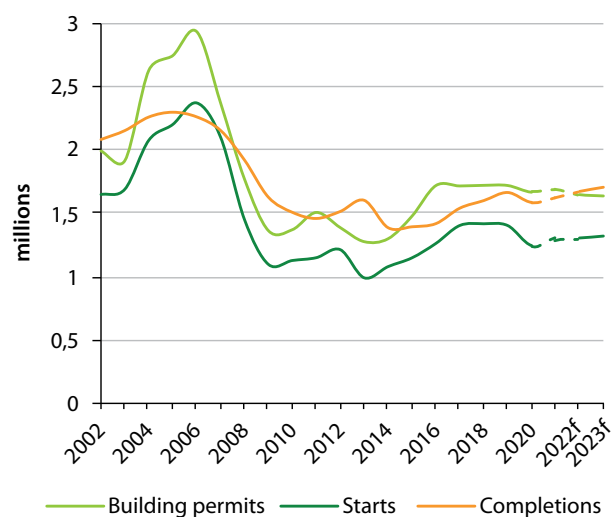
| | 2021e | 2022f | 2023f | 2020-2021 | 2021-2022 | 2022-2023 |
|--|----------------|----------------|----------------|------------|------------|------------|
| | BILLION (€) | | | CHANGE (%) | | |
| New residential construction | 353.5 | 363.6 | 369.3 | 5.4 | 2.8 | 1.6 |
| Residential remodelling | 465.2 | 474.9 | 480.2 | 5.1 | 2.1 | 1.1 |
| Non-residential – new | 271.7 | 281.3 | 289.4 | 0.7 | 3.5 | 2.9 |
| Non-residential – remodelling | 240.1 | 247.3 | 252.8 | 2.5 | 3.0 | 2.3 |
| Civil engineering – new | 211.1 | 221.1 | 228.6 | 4.8 | 4.8 | 3.4 |
| Civil engineering – remodelling | 160.4 | 164.3 | 168.8 | 2.5 | 2.5 | 2.7 |
| Total | 1,702.0 | 1,752.5 | 1,789.1 | 3.8 | 3.0 | 2.1 |

Note: In 2018 prices; e = estimate; f = forecast.

Source: Euroconstruct, 2021.

In the short term, supply and labour constraints are expected to limit housing construction and remodelling. Consumer survey data indicate that near-term plans to buy or build houses have attained their highest level since 2003, and the intention to remodel houses is at its highest on record (ECB, 2021). New residential building is a value driver in the Euroconstruct region, accounting for nearly 25% (€342 billion) of the construction market value in 2020, with residential remodelling comprising 26.9% of expenditure. New residential spending increased by 24.0% (€65.0 billion) between 2015 and 2020 (Euroconstruct, 2021).

Although housing construction estimates and forecasts are somewhat tempered, the interest of investors in the residential sector appears to have increased. A survey found that 68% of repurposed buildings in Europe were converted to residential in 2020. Investment capital is being directed to residential (real estate), or “beds and sheds”, with the sector holding six of the top ten places in Europe’s investment rankings. The residential subsectors include retirement and assisted living; affordable housing; rented residential; student accommodation; co-living; and serviced apartments. All are attracting significant interest from investors – they are

GRAPH 1.2
Building permits, starts and completions, Euroconstruct region, 2002-2023


Note: e = estimate; f = forecast.

Sources: Euroconstruct, 2004, 2021.

seen as having solid demographic demand, and residential real estate also fits within many environmental, social and corporate governance plans (PwC, 2020, 2021).

Building-permit forecasts for 2021-2023 in the Euroconstruct region indicate a reduction in applications – although nowhere near the low levels seen in 2009-2014 (when the annual average was 1,378,000). Forecasts of total housing starts and completions indicate a modest improvement through 2023 (graph 1.2) (Euroconstruct, 2021).

■ EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

The housing market in the EECCA is dominated by the Russian Federation and, to a lesser extent, Ukraine and Uzbekistan. The available data indicate that the number of new dwellings constructed dropped significantly in the EECCA in 2020, as did total new floor space (table 1.2).

Russian Federation housing-price data indicate that aggregate prices there increased by 24.5% between the third quarter of 2018 and the fourth quarter of 2021 (FRED, 2021a). Moscow and St Petersburg recorded year-on-year increases of 22.4% and 22.1%, respectively (first-quarter 2020 to first-quarter 2021) (Gerrity, 2021).

Lossan (2021) reported that the Russian Federation has approximately 3.8-4.0 billion m² of residential floor space, with

TABLE 1.2

Construction of new dwellings and floor area, EECCA other than the Russian Federation, 2019-2020

| | 2019 | 2020 | 2019-2020 | 2019 | 2020 | 2019-2020 |
|---------------------|-----------------------|----------------|------------|---|---------------|------------|
| | New dwellings (units) | | Change (%) | New floor space (1,000 m ²) | | Change (%) |
| Armenia | 1,015 | ... | ... | 288 | ... | ... |
| Azerbaijan | 87,400 | 47,200 | -46 | 9,469 | 4,957 | -48 |
| Belarus | 47,600 | 48,800 | 3 | 4,062 | 4,152 | 2 |
| Georgia | ... | ... | ... | ... | ... | ... |
| Kazakhstan | 33,024 | 21,336 | -35 | 364 | 373 | 2 |
| Kyrgyzstan | ... | 9,311 | ... | 1,380 | 903 | -35 |
| Republic of Moldova | 9,955 | 6,906 | -31 | 763 | 546 | -29 |
| Tajikistan | ... | ... | ... | 2,700 | ... | ... |
| Turkmenistan | ... | ... | ... | N/A | ... | ... |
| Ukraine | 188,964 | 65,916 | -65 | 11,029 | 5,750 | -48 |
| Uzbekistan | 79,200 | 79,800 | 1 | 14,483 | 12,677 | -12 |
| Total | 446,143 | 269,958 | -39 | 40,170 | 28,455 | -29 |

Note: The total comprises only those countries with complete national datasets.

Sources: Statistical Committee of the Republic of Armenia, 2021; State Statistical Committee of the Republic of Azerbaijan, 2021; National Statistical Committee of the Republic of Belarus, 2021; Ministry of the National Economy of the Republic of Kazakhstan Committee on Statistics, 2021; National Statistical Committee of the Kyrgyz Republic, 2021; National Bureau of Statistics of the Republic of Moldova, 2021; TAJSTAT, 2021; State Statistics Service of Ukraine, 2021; State Committee of the Republic of Uzbekistan on Statistics, 2021.

Moscow accounting for about 7% of this (280-300 million m²). This quantity, and an average annual construction of about 76 million m² of additional space, is insufficient to meet the Russian Federation's future housing needs. In response to the economic effects of the pandemic and projected housing needs, the government launched the Action Programme for the Development of Residential Housing Construction and Mortgage Lending, including the Housing and Urban Environment project. The programme envisioned the commissioning of 82 million m² of residential floor space in 2020, with the aim of putting in place 80 million m² of multi-apartment housing per year (from a baseline of 46.2 million m²) and increasing private housing construction (housing constructed by private citizens from 33 million m² annually to 40 million m²) (Blokchina *et al.*, 2021). It is estimated that 15-18% of new Russian housing construction is wooden.

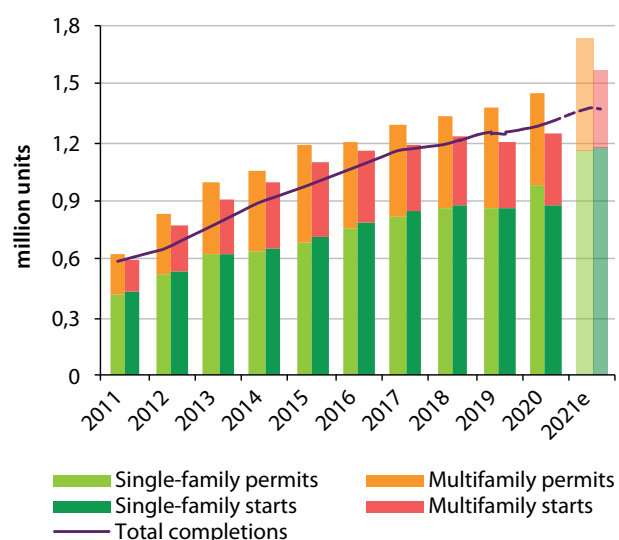
■ NORTH AMERICA

Pandemic-related work-at-home orders have accelerated outmigration from large urban areas in the United States and led to robust remodelling demand (Metropolitan Policy Program, 2021). Outmigration, low interest rates, a limited supply of houses for sale, remodelling, and favourable demographics, including pent-up demand, were the primary factors driving housing construction activities and sales in the United States in 2020 (FRED, 2021b). The housing market in Canada was affected by immigration, favourable demographics, pent-up demand, low interest rates, and a record low supply of houses for sale (CREA, 2021).

The United States housing construction market grew robustly in 2020 and through the first half of 2021, despite pandemic effects and record-high construction product prices. New housing construction was strong in early 2020 but declined precipitously in March and April with the onset of the pandemic and associated restrictions. From June onward, both new construction and remodelling activity expanded near-exponentially. Forest products such as framing lumber, structural panels and appearance-based hardwood species were in limited supply in the second half of 2020 and the first half of 2021, as they were difficult to procure and expensive (see chapters 3 and 4).

Total housing starts in the United States was estimated at 1.38 million in 2020, up by 6.9% compared with 2019 (graph 1.3) (US Census Bureau, 2021a) and well above the historical average of 1.01 million units.

GRAPH 1.3

United States housing permits, starts and completions, 2011-2021

Note: f = forecast; January-June 2021 data; seasonally annualized adjusted rate.

Sources: US Census Bureau, 2021a; MBA, 2021.



Canadian new-housing construction and sales were robust in 2020 and the first half of 2021. Total housing starts in 2020 increased by 3.8%, year-on-year (to 216,652 units). The housing market in Canada has shifted over the last decade from one dominated by single-detached housing before 2009 to a multifamily housing market dominated by the construction of new apartments. Fifty-seven percent of new housing starts in Canada in 2020 were apartments (CMHC, 2021).

Hogue (2021) stated that, “exceptionally low interest rates, changing housing needs and high household savings continue to stoke homebuyer demand at this stage”; these are primary factors in the current robust housing market in Canada. The main concerns are affordability, housing overvaluation (with prices at historic highs, even after adjusting for inflation), household debt, a lack of inventory available for sale, and price rises.

The number of new Canadian housing starts is projected at 258,000 units in 2021 and 213,000 units in 2022 (averaged from BMO, 2021; RBC, 2021; Scotia Bank, 2021; TD Bank, 2021). The forecast for 2023 is for 208,000 starts (TD Bank, (2021).

Policy and regulatory developments

The policy focus throughout the UNECE region in 2020 was on mitigating the impacts of the pandemic. Significant economic policy was enacted to support business sectors, including the forest and forest product sectors. Most notably in the EU, policy improvements were aimed at addressing identified vulnerabilities in global value chains, strengthening markets and supporting a transition to a climate-neutral economy. Governments in the EECCA also made investments in the forest products sector, and Canada and the United States both announced initiatives related to investment in green infrastructure that could benefit forest product markets.

■ EUROPE

To respond to the economic and health crises caused by the pandemic, the EU upped its 2021-2027 budget and, in May 2020, adopted the temporary recovery instrument, Next Generation EU (EU, 2020a), which will provide €750 billion in funding designed to protect lives and livelihoods, repair the EU single market and build a lasting and prosperous recovery. Affordable public housing and building renovation – often linked to energy-efficiency improvements and the use of renewable energy sources such as woody biomass – feature prominently in the national recovery plans of more than half the EU member countries.³ In conjunction with the EU's Renovation Wave, it is expected that markets will be strong in coming years for various forest products used in construction and renovation (EU, 2020b). Markets will be further bolstered by investments in information technology and skills and underpinned by the New European BauHaus (EU, 2021a), an interface of technical, social and cultural aspects of buildings.

The pandemic has highlighted vulnerabilities in global value chains and shown the pivotal role played by a functional single EU market with global links. Thus, the EU further revised its Industrial Policy in May 2021 to help reach the twin goals of a green and digital transition to a low-carbon economy with net-zero greenhouse-gas emissions by 2030 (EU, 2021a; EU, 2021b). The aim of the policy is to strengthen the resilience of the single market and address strategic industrial dependencies. Forest-based industries in the EU can participate in both the broad and short-term initiatives in the EU (COVID-19) Recovery Plan, backed by the EU Industrial Policy.

The new EU Forest Strategy for 2030 is anchored in the European Green Deal (EU, 2019) and builds on the revised EU Biodiversity Strategy for 2030 (EU, 2020c). It aims to help attain the EU's biodiversity objectives and the EU's revised Climate Policy greenhouse-gas emission reduction (and hence Green Deal) target of at least 55% by 2030 and net climate neutrality by 2050. The Forest Strategy is also designed to contribute to attaining the UN's Sustainable Development Goals, especially goal 15. With its links to the EU's Biodiversity Strategy and Climate Policy, the EU Forest Strategy will have indirect medium- and long-term influences on forest product markets via its impacts on upstream forest resources (EU, 2021c). The strategy confirms the importance of forestry and forest-based industries in the EU27 in providing up to 4 million jobs and generating over €160 billion in gross added value.⁴ Together

³ The national plans of Croatia, the Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Slovakia, Slovenia and Spain earmark at least €45 billion, of which a significant portion might be expected to use wood-based materials and products.

⁴ 2018 figures, including forestry and logging, sawmilling, wood-based products, cork, pulp and paper, furniture and paper-based printing.

with actors across the entire forest-based value chain, the multifunctional role of forests is a key component of the EU Forest Strategy to help achieve climate goals sustainably by contributing to lively and prosperous rural areas.

The main elements of the EU Forest Strategy likely to ultimately affect the EU's and hence the UNECE's forest product markets are as follows:⁵

- protecting, restoring and enlarging the EU's forests to combat climate change, reverse biodiversity loss and ensure resilience in multifunctional forest ecosystems;
- conducting strategic forest monitoring, reporting and data collection;
- supporting the socio-economic functions of forests for thriving rural areas and boosting the forest-based bioeconomy within sustainability boundaries;
- promoting a sustainable forest bioeconomy for long-lived wood products;
- developing skills and empowering people for a sustainable forest-based bioeconomy;
- ensuring the sustainable use of wood-based resources for bioenergy;
- strengthening the EU's research and innovation agenda to improve knowledge of forests;
- establishing an inclusive and coherent EU forest governance framework; and
- stepping up the implementation and enforcement of existing EU laws.

Sustainable materials, including forest products, are key to the EU's transition to a sustainable climate-neutral economy. The EU Forest Strategy recognizes that carbon removal initiated in trees can be "significantly extended" by processing woody biomass into materials and products with long lifecycles; harvested wood products⁶ are estimated to comprise a carbon sink of around 40 million tonnes of carbon dioxide equivalent (MtCO₂e) per year, and the material substitution effect of wood is estimated in the range of -18 to -43 MtCO₂e per year (Grassi *et al.*, 2021). Downstream, the "cascading

principle"⁷ using market incentives is seen as crucial, and the "circular" role of shorter-lived wood products that can be re-used or recycled is also important. Accordingly, the EU Forest Strategy aims to further increase (quantitatively and qualitatively) the supply of sustainably grown and legally harvested wood for materials and energy (EU, 2018).

The strategy reiterates the important role for wood products in turning the construction sector from a source of greenhouse-gas emissions into a carbon sink. In the context of the revision of the Construction Products Regulation (EU, 2011), the European Commission will develop a standard, robust and transparent methodology to quantify the climate benefits of wood construction products and other building materials.

The Forest Strategy states that 60% of the EU's renewable energy comes directly or indirectly from wood and that wood energy will continue to play a role, but it also indicates that the use of whole trees for energy production should be minimized. This is in line with the EU Biodiversity Strategy for 2030 and applies to all trees, whether from the EU or imported.

■ EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

Although the timber industry in the EECCA was not one of the most affected sectors in the early stages of the pandemic, it did encounter significant reductions in the production, trade and consumption of wood products. The furniture industry and wood-based panels segments experienced the biggest declines.

Based on a defined set of criteria, some countries developed and implemented distinct actions and policies in response to the pandemic. For example, the Government of the Russian Federation adopted measures to support important enterprises by providing them with targeted aid. Under the scheme, 35 timber enterprises and 18 furniture companies were considered eligible for state aid, including tax and insurance contribution deferrals; state guarantees for loans; and subsidies for production operations. Mechanisms included (WhatWood, 2021a):

- low-interest loans for working-capital financing and saving jobs. About 400 billion roubles (\$5.5 billion) is estimated to have been allocated for this programme;
- a six-month moratorium on bankruptcy;

5 This is an incomplete list of market-relevant components of the EU Forest Strategy.

6 The harvested wood product categories are sawnwood, wood panels and paper. In greenhouse-gas mitigation, these are assigned first-decay functions with half-life values of 35, 25 and 2 years, respectively. Thus, paper decays much faster (i.e. has much lower mitigation potential over time) than the other two categories. Any harvested wood product that does not fall into these categories is regarded as instantaneously oxidized.

7 The "cascading principle" can be described as: successive uses of a resource, e.g wood, through its re-use, recycling and possibly ultimate energy generation, so as to retain its material status and solid carbon for as long as practicably possible, compatible with market forces and logistics

- deferred or instalment payments for taxes due in 2020;
- government guarantees to cover business losses; and
- in some regions, allocations by authorities to forest enterprises with an option to defer payments for forest use.

Other significant measures adopted regionally for the timber industry were supporting forest tenure-holders with forest regeneration and the provision of materials for road rehabilitation. In some regions, the adopted measures included a requirement to use only locally produced wood for construction.

The Government of Ukraine adopted a range of financial and economic aid measures in 2020 to support citizens and businesses affected by the pandemic. The Cabinet of Ministers of Ukraine introduced initiatives aimed at supporting small and medium-sized enterprises in April and May 2020 and modified existing support programmes that also apply to companies in the forest and wood-processing sector (UNECE/FAO, 2021a).

Independent of these measures, the Russian Federation introduced new duties on exports of green lumber with a moisture content exceeding 22% for the period 1 July to 31 December 2021. The duty on softwood and oak lumber is 10% but not less than €13 and €15 per m³, respectively. Duties were previously not charged on these species. Export duties on beech and ash lumber also amount to 10% but not less than €50 per m³ (previously they were €10 and €12 per m³, respectively) (Lesprom, 2021).



■ NORTH AMERICA

Economic contractions and disruptions to global transportation networks affected the wood product trade in the United States in the early stages of the pandemic. Some ports were closed in 2020, affecting shipping. As of October 2020, United States exports of wood-based products were 32% lower than in 2019 and imports were

down by 26%. Exports of wood-based products in March 2021 were, however, nearly identical to those in March 2020, and imports were about 36% higher (CRS, 2021). The United States Congress provided \$200 million in assistance to timber harvesters and haulers in response to the pandemic. Other forest-sector industries have also been eligible for assistance under various economic policies in the form of loans, tax relief and other financial support (CRS, 2021).

The Softwood Lumber Agreement between Canada and the United States expired on 12 October 2015. In place since 2006, this agreement addressed tariffs on lumber traded between the two countries as part of a decades-long trade dispute covered in earlier editions of the *Review*. In June 2020, the United States Department of Commerce submitted the Softwood Lumber Subsidies Report to the United States Congress, as per the reporting provision of the Softwood Lumber Act of 2008, covering the period 1 January 2019 to 30 June 2019. The report found that 43 countries exported softwood lumber and softwood lumber products to the United States over the period, with Canada accounting for 89.7% of the total, Germany for 3.78%, Brazil for 1.43% and Sweden for 1.01% (US DOC, 2020). Lumber trade in North America has been under scrutiny in response to pricing trends during the pandemic. Prices increased for softwood lumber by 121.1% between April 2020 and April 2021 and for hardwood lumber by 31.6% (US BLS, 2021a). In April 2021, Canada and the United States announced a joint initiative addressing green infrastructure investments and efforts to advance net-zero emission targets, including opportunities for wood, pulp and paper and lower-carbon forest bioproducts (FPAC, 2021; The White House, 2021).

The United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) announced the implementation of phase 6 of the Lacey Act enforcement schedule, which was to go into effect on 1 October 2020. First enacted in 1900, the Lacey Act combats trafficking in illegal wildlife, fish and plants. The Food, Conservation, and Energy Act of 2008 amended the Lacey Act to require importers to submit declarations for certain products at the time of importation. APHIS ensures compliance with the declaration requirement, and products needing declarations have been phased in since enforcement began in 2009. The additional products proposed to be covered by the phase-6 enforcement schedule include certain essential oils (e.g. cedarwood and sandalwood), wood cases and trunks, oriented strandboard, boxes, crates, pallets and musical instruments (e.g. clarinets and drums) (US Federal Register, 2020). In August 2020, the USDA announced a decision to delay implementation of phase 6 of the Lacey Act enforcement schedule due to the pandemic (USDA, 2020).

In November 2020, the United States Forest Service completed amendments to the regulations of the National

Environmental Policy Act (NEPA) governing environmental analysis and decision-making in the agency, including management and harvesting activities. The United States Forest Service last updated its NEPA regulations in 2008, and the most recent updates are expected to expedite operations with new tools allowing for categorical exclusions and additional flexibility (USFS, 2020a). Many foundational elements of the NEPA regulations remain unchanged, including requirements for scoping, public engagement and categories of the actions normally requiring an environmental impact statement (USFS, 2020b).

Certified forests and products

The area of certified forests worldwide increased by 0.8% (3.5 million ha) between mid-2019 and mid-2020, to 435.5 million ha, a new all-time high (graph 1.4). The two major schemes, the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), reported a combined total of 530 million ha of certified forest as of mid-2020; this amounts to 435.5 million ha of actual forest after accounting for double-certification (i.e. forest areas certified by both certification schemes) (FSC, 2020; PEFC, 2020; PEFC, 2021a).

The PEFC's revised Sustainable Forest Management and Group Certification benchmark standard published in November 2018 extended PEFC certification to encompass trees outside forests; the PEFC benchmark can therefore now be applied to agroforestry and urban forestry (PEFC, 2018). The Sustainable Forestry Initiative (SFI), a PEFC-endorsed programme operating in Canada and the United States, has announced its intention to complete, by 2022, an urban and community forest certification standard (SFI, 2021). Four countries (China, India, Indonesia and the Netherlands) have applied to the PEFC for endorsement assessments that include trees outside forests within the scope of their national standards (PEFC, 2021b).

It is estimated that about 46 million tonnes of fresh-weight merchantable wood, equivalent to 7.2 billion board feet of lumber or 16 million cords of firewood, is generated annually in urban forests in the United States, which could produce substantial annual revenue if used while also providing valuable social and environmental goods and services (Nowak *et al.*, 2019). These materials currently appear within waste streams and, when recovered, are most commonly used for bioenergy and panel production and composting. The management of wood waste streams is variable in the UNECE region and often depends on regulations and



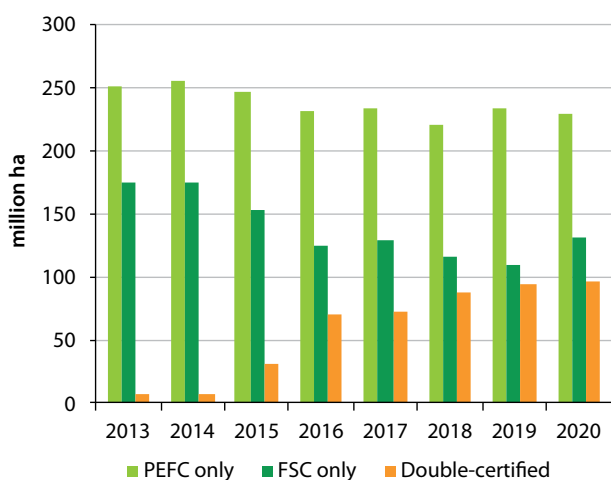
classification systems. More universal or mutually recognized international classification systems could aid in quantifying the available material more accurately and support improved recovery to meet circular-economy objectives. In March 2021, the UNECE and FAO published a draft catalogue of wood waste classifications in the UNECE region that takes stock of existing classifications; it could support the development of a practical tool for facilitating wood waste trade in the region (UNECE/FAO, 2021b).

Summary of regional and subregional markets

The overall consumption of primary forest products declined modestly in all general categories in the UNECE region in 2020: by 3.3% for industrial roundwood; by 1.9% for sawnwood; by 4.3% for wood-based panels; and by 3.9% for paper and paperboard (table 1.3).

GRAPH 1.4

FSC- and PEFC-certified forest area, 2013-2020



Note: Double-certified area as of mid-2020; area certified by certification scheme as of December 2020. The total actual area of certified forest is the sum of the area certified solely by the FSC, the area certified solely by the PEFC, and the area of double-certified forest. FSC = Forest Stewardship Council; PEFC = Programme for the Endorsement of Forest Certification.

Sources: FSC, 2020; PEFC, 2020, 2021a; UNECE/FAO, 2020.



TABLE 1.3

Apparent consumption of industrial roundwood, sawnwood, wood-based panels, and paper and paperboard, UNECE region by subregion, 2016-2020

| | (1,000) | 2016 | 2017 | 2018 | 2019 | 2020 | Change (volume/ weight) 2019-2020 | Change (%) 2019- 2020 | Change (%) 2016- 2020 |
|-----------------------------|----------------|-----------|-----------|-----------|-----------|-----------|--|--------------------------------|--------------------------------|
| Industrial roundwood | | | | | | | | | |
| Europe | m ³ | 410,172 | 409,358 | 440,141 | 431,209 | 420,245 | -10,964 | -2.5% | 2.5% |
| EECCA | m ³ | 194,721 | 198,419 | 226,336 | 213,290 | 211,911 | -1,379 | -0.6% | 8.8% |
| North America | m ³ | 516,384 | 513,350 | 534,285 | 517,736 | 491,767 | -25,969 | -5.0% | -4.8% |
| Total | m ³ | 1,121,277 | 1,121,127 | 1,200,762 | 1,162,236 | 1,123,923 | -38,312 | -3.3% | 0.2% |
| Sawnwood | | | | | | | | | |
| Europe | m ³ | 107,552 | 110,809 | 113,159 | 110,628 | 109,523 | -1,105 | -1.0% | 1.8% |
| EECCA | m ³ | 16,689 | 17,792 | 16,746 | 17,933 | 16,777 | -1,156 | -6.4% | 0.5% |
| North America | m ³ | 117,570 | 118,392 | 120,097 | 117,076 | 114,726 | -2,350 | -2.0% | -2.4% |
| Total | m ³ | 241,811 | 246,992 | 250,001 | 245,637 | 241,026 | -4,611 | -1.9% | -0.3% |
| Wood-based panels | | | | | | | | | |
| Europe | m ³ | 71,704 | 74,210 | 75,854 | 74,961 | 71,528 | -3,432 | -4.6% | -0.2% |
| EECCA | m ³ | 16,687 | 18,351 | 21,204 | 19,364 | 18,204 | -1,160 | -6.0% | 9.1% |
| North America | m ³ | 54,270 | 56,603 | 54,771 | 55,249 | 53,421 | -1,827 | -3.3% | -1.6% |
| Total | m ³ | 142,662 | 149,165 | 151,829 | 149,573 | 143,154 | -6,420 | -4.3% | 0.3% |
| Paper and paperboard | | | | | | | | | |
| Europe | tonnes | 88,407 | 89,959 | 89,555 | 86,296 | 82,741 | -3,554 | -4.1% | -6.4% |
| EECCA | tonnes | 9,561 | 9,507 | 10,007 | 10,103 | 9,998 | -105 | -1.0% | 4.6% |
| North America | tonnes | 75,602 | 75,037 | 74,055 | 71,520 | 68,587 | -2,933 | -4.1% | -9.3% |
| Total | tonnes | 173,571 | 174,503 | 173,617 | 167,919 | 161,326 | -6,593 | -3.9% | -7.1% |

Note: Sawnwood does not include sleepers through 2016. Wood-based panels do not include veneer production.

Sources: FAOSTAT, 2021; UNECE/FAO database, 2021.

A photograph of a train car filled with stacked logs. The logs are cut into sections, showing their circular cross-sections. The train car is made of dark brown metal. The background is a clear blue sky. The text "Chapter 2" is overlaid in a white box, and "WOOD RAW MATERIALS" is overlaid in a yellow box. The author's name "Author: Håkan Ekström" is overlaid in a white box.

Chapter 2

WOOD RAW MATERIALS

Author: Håkan Ekström

Introduction and UNECE region overview

The total timber harvest in the UNECE region fell by 3.4% in 2020, to 1.40 billion m³, of which 82% was industrial roundwood and 18% was wood fuel. The most significant decline from 2019 was in North America, while there was minimal change in the EECCA.

The consumption of industrial roundwood in the UNECE region declined in 2020 for the second consecutive year, to 1.12 billion m³. Non-coniferous industrial roundwood consumption fell by 10%, to 229 million m³, the lowest level since 2009. The reduction in the use of coniferous industrial roundwood was more modest, at only -1.3%, for a total of 895 million m³.

The UNECE region is a major exporter of industrial roundwood, and it accounted for 78% of the coniferous and 58% of the non-coniferous industrial roundwood traded globally in 2020. Exports totalled 93 million m³, the highest level in 13 years. The trend for exports over the last five years has been upward for Europe (+53%) and downward for the EECCA (-33%) and North America (-34%). The largest industrial roundwood exporters in the UNECE region are the Czech Republic, the Russian Federation, Germany, the United States, Canada, Belgium, Poland and Norway (in descending order, by volume).

European harvests of industrial roundwood fell by 2% in 2020, to 426 million m³, after eight consecutive years of increase. The most significant declines in 2020 were in Finland, Italy, Poland, Austria and Slovakia (in descending order, by volume), predominantly because of increased log imports from neighbouring countries with ample supplies of insect- and storm-damaged timber.

Strong sawnwood markets in Europe and North America moved sawlog prices upward in 2020 and early 2021, with the most significant increases occurring in eastern and central Europe, western Canada and the western United States. In July and August 2021, however, lumber prices plummeted in the United States and, in the absence of major reductions in the cost of sawlogs, profit margins fell for sawmills throughout the country.

Total industrial roundwood exports from the Russian Federation increased slightly in 2020, reversing a downward trend that had lasted more than ten years, although the decreasing trend applied only to coniferous industrial roundwood. The volume of non-coniferous industrial roundwood exports has been increasing steadily, reaching 8.1 million m³ in 2020, up by 80% from 2010. The most significant increases in roundwood exports have been for non-coniferous sawlogs to China and for pulplogs to Finland.

Removals of industrial roundwood in the United States amounted to 370 million m³ in 2020, the lowest volume in six years, while Canadian removals were at 130 million m³, an 11-year low. The decline in timber harvests was driven mainly by the impact of the COVID-19 pandemic, which interrupted log supply chains.

China, the world's largest importer of logs, has relied for a long time on the Russian Federation for a significant volume of raw material for its wood industry. This relationship may change in 2022, however, should the Russian Federation implement its proposed ban on log exports. The ban could have far-reaching impacts on global trade flows of industrial roundwood and sawnwood, with China likely to source more sawlogs from Europe, North America and Oceania.

Europe

The European harvest of industrial logs fell by 2% in 2020, to 426 million m³ (graphs 2.1 and 2.2), after eight consecutive years of increase. The most significant decreases were in Finland, Italy, Poland, Austria and Slovakia (in descending order, by volume), mainly because of increased log imports from countries in central Europe with ample insect- and storm-damaged timber supply. Germany was the only country in the subregion to substantially increase its harvest in 2020; its annual removals have risen by 40% over the last five years, to a record high of 62 million m³.

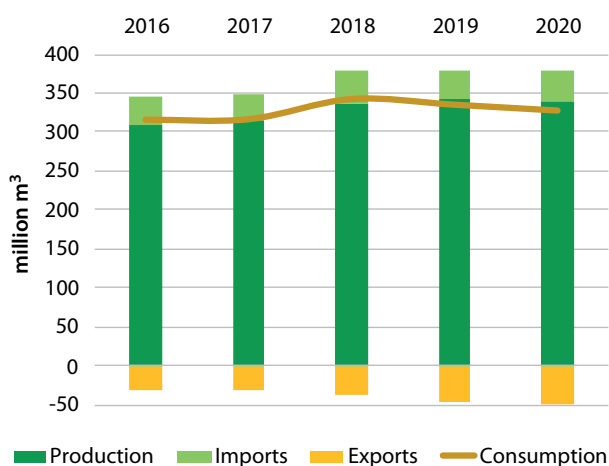
In addition to log removals for industrial purposes, Europe harvested an estimated 143 million m³ for fuel, a volume that is practically unchanged from 2016.

The consumption of coniferous industrial roundwood (which accounted for 78% of total roundwood consumption) fell slightly in 2020, year-on-year, but was almost 3% higher than in 2016. Five countries – Sweden, Germany, Finland, Poland and Austria (in descending order, by volume) – were the biggest consumers of coniferous industrial roundwood in Europe, accounting for almost two-thirds of the subregion’s total.

Europe has long been a net importer of coniferous industrial roundwood. This changed in 2019 and 2020, however, when log exports to China took off and Europe reduced imports from the Russian Federation. The subregion’s net exports reached almost 12 million m³ in 2020, with China the key destination outside Europe.

GRAPH 2.1

Europe: Coniferous industrial roundwood production, trade and consumption, 2016-2020

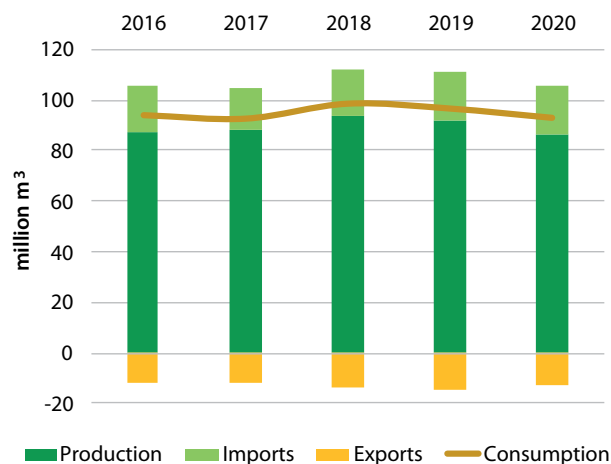


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 2.2

Europe: Non-coniferous industrial roundwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

Table 2.1 shows the top five intra-European trade flows of coniferous logs in 2020. The Czech Republic and Germany were the major exporting countries in Europe in 2020, and both shipped logs to markets in which they were absent five years ago. In addition to the strong intraregional trade, Germany and the Czech Republic started exporting coniferous roundwood to China in 2019. Together, these two countries exported more than 10 million m³ of coniferous industrial roundwood to China in 2020 (Wood Resources International, 2021). It is important to note, however, that the steep increase in exports in 2019 and 2020 was caused by the large volume of insect- and storm-damaged timber in central Europe and, therefore, much of the current log trade is temporary and will decline in coming years.

Sawn softwood production in Europe has increased steadily in the last five years. Consequently, additional volumes of sawmill byproducts, such as wood chips, shavings and sawdust, have become available to other sectors. Manufacturers of pulp, panels and pellets usually prefer residuals as fibre furnish over costlier small-diameter logs.

The annual volume of residuals generated in European sawmills has grown considerably in the last five years, to an estimated 17 million m³, resulting in an increased wood-chip trade in the subregion, particularly in northern European countries. The softwood chip trade around the Baltic Sea increased by over 80% between 2015 and 2020, with significant exports from the Russian Federation to Finland, from Norway to Sweden, and from the Baltic states to Denmark and Sweden.

TABLE 2.1

Top five intra-European trade flows of coniferous industrial roundwood, 2020

| Origin–destination | million m ³ | Change 2015-2019 (%) |
|------------------------|------------------------|----------------------|
| Czech Republic–Austria | 6.3 | 110 |
| Germany–Austria | 3.2 | 78 |
| Czech Republic–Germany | 2.7 | 12 |
| Norway–Sweden | 2.6 | 8 |
| Czech Republic–Poland | 2.5 | N/A |

Source: Wood Resources International, 2021.

With weaker pulp markets, wood-fibre consumption by European pulpmills declined to its lowest level in five years in 2020, according to the Confederation of European Paper Industries (CEPI). The sector consumed an estimated 146 million m³ of wood fibre in 2020, down by 6% from the previous year, comprising industrial coniferous roundwood (49%), non-coniferous industrial roundwood (27%), coniferous wood chips (23%), and a negligible amount of non-coniferous wood chips. The volume of coniferous wood chips in 2020 was down by more than 1 million m³ from 2019, which is surprising given the increase in sawn softwood production and generated byproducts in 2020 (CEPI, 2021).

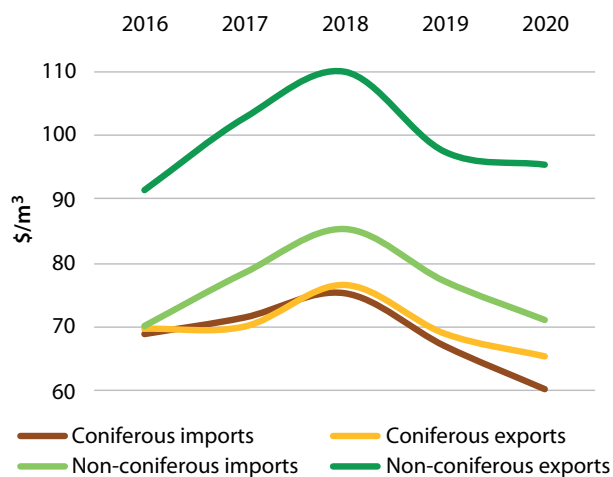
The traded unit value of industrial roundwood has been decreasing in Europe since 2018 (graph 2.3).

The downward trend in sawlog prices was interrupted in the fourth quarter of 2020 as the sawnwood market improved. Consequently, the European Sawlog Price Index rose by 9% in the fourth quarter of 2020, quarter-on-quarter, and by 7% in the first quarter of 2021, with the most significant increases occurring in eastern and central Europe (graph 2.4).



GRAPH 2.3

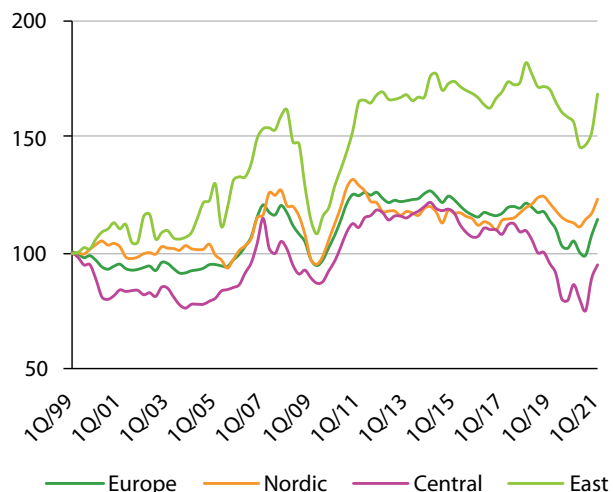
Europe: Traded industrial roundwood unit value, 2016-2020



Source: UNECE/FAO database, 2021.

GRAPH 2.4

European Quarterly Sawlog Price Index, 1999-2021



Source: Wood Resource Quarterly, 2021.

Eastern Europe, Caucasus and Central Asia

Industrial roundwood production in the EECCA was steady in 2020, year-on-year, at 228 million m³, comprising 182 million m³ of coniferous and 46 million m³ of non-coniferous logs (graphs 2.5 and 2.6). Although production and consumption were stable overall, trends diverged between countries.

In Belarus, industrial roundwood removals doubled between 2010 and 2020, driven mostly by higher raw-material consumption in the expanding export-oriented sawmilling industry. Belarus is the only country in the subregion that has significantly expanded coniferous sawn softwood exports in the last five years, predominantly to neighbouring countries and to China.

The Russian Federation's harvests have decreased for the last two years, to an estimated 202 million m³ in 2020. Most of the decline has been in coniferous industrial roundwood, driven by reduced export demand and falling consumption among domestic sawn softwood producers. Despite this recent reduction in industrial roundwood demand in the Russian forest industry, the long-term trend is upward. Total log consumption for industrial uses was almost 50% higher in 2020 than in 2010.

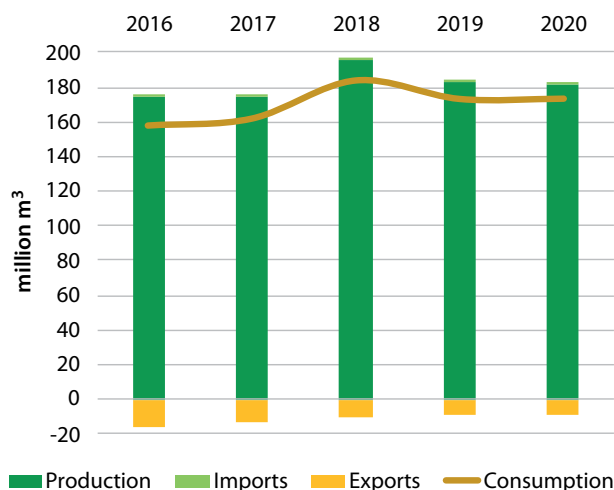
Removals of non-coniferous industrial roundwood in the Russian Federation have been relatively stable for the last five years, at around 40 million m³ annually. Just over 20% of the harvest in 2020 was exported in log form to sawmills in China and pulp mills in Finland and Sweden. Domestic hardwood consumption has been mainly in three sectors: pulp, plywood and "other industrial roundwood", a category comprising posts, poles, pitprops and other products.

Total industrial roundwood exports from the Russian Federation increased slightly in 2020, reversing a downward trend that lasted more than ten years. Only coniferous industrial roundwood exports have declined in the past decade, however: non-coniferous industrial roundwood exports have increased steadily, reaching 8.1 million m³ in 2020, up by 80% from 2010. The most significant increases have been for non-coniferous sawlogs to China and for pulplogs to Finland.

The Russian Federation exported 16 million m³ of industrial roundwood in 2020, which accounted for almost 12% of globally traded industrial roundwood. Much of this trade could come to a halt next year, however, when a new law proposed by the Russian president would ban exports of softwood logs and high-value hardwood logs from 1 January 2022. The government is also considering new regulations aimed at reducing exports of green sawn softwood. If the law is enacted, it will affect the forest industry most significantly in

GRAPH 2.5

EECCA: Coniferous industrial roundwood production, trade and consumption, 2016-2020

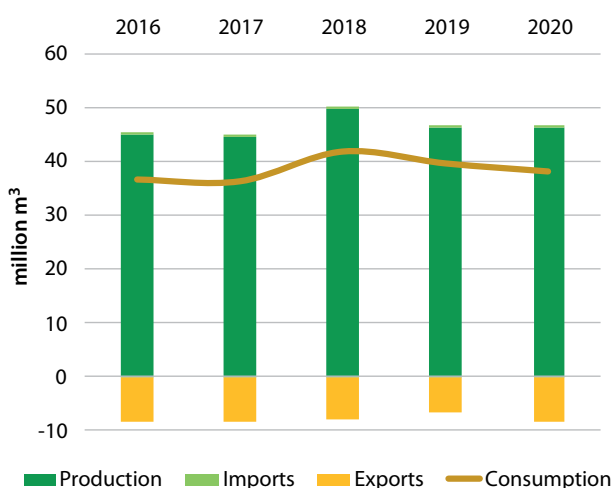


Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

GRAPH 2.6

EECCA: Non-coniferous industrial roundwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

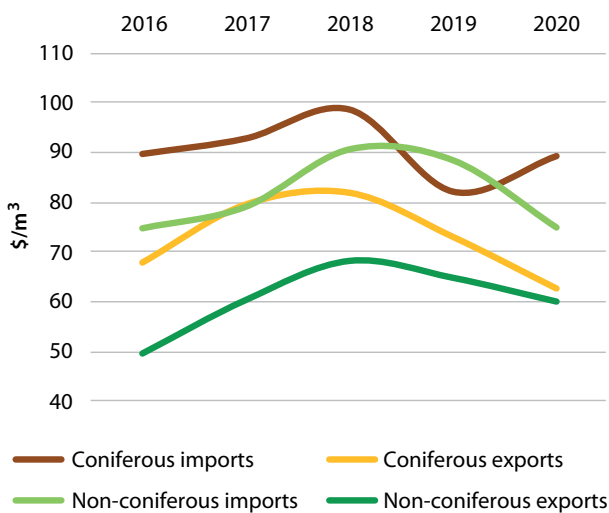
Source: FAOSTAT, 2021.

the country's eastern parts, where an estimated 10% of the timber harvest is exported in log form. In the short term, the Chinese sawmilling industry will be affected most directly because exports of softwood logs, mainly from the Russian Far East and Siberia, are likely to be prohibited.

Declared export unit values in the EECCA decreased by 14.1% (to an average of \$63 per m³) for coniferous and by 7.4% (to an average of \$60 per m³) for non-coniferous industrial roundwood in 2020. Import volumes of industrial roundwood decreased by 25.9%, with unit values of non-coniferous industrial roundwood dropping by 15.3% (to an average of \$75 per m³). Contrary to the overall trend, the import unit value of coniferous industrial roundwood increased by 8.7% in 2020, year-on-year (to an average of \$89/m³) (graph 2.7).

GRAPH 2.7

EECCA: Traded industrial roundwood unit value, 2016-2020



Source: FAOSTAT, 2021.



North America

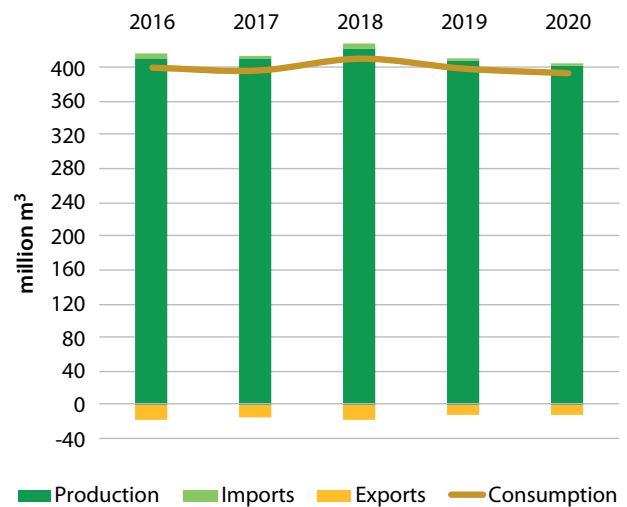
Removals of industrial roundwood fell by 5.3% in North America in 2020, partly because of the impact of the COVID-19 pandemic, which interrupted log supply chains. Removals of industrial roundwood in the United States totalled 370 million m³ in 2020, the lowest level in six years, and Canadian removals were at 130 million m³, an 11-year low. Consumption fell much more for non-coniferous than for coniferous industrial roundwood in both Canada and the United States. The production of coniferous industrial roundwood declined by 1.8% (graph 2.8). The production of non-coniferous roundwood dropped dramatically – by 17.3% – in 2020 (graph 2.9). The slump in sawn hardwood production and consumption is discussed further in chapter 3.

A shortage of labour in the forest, for transportation, and in processing facilities resulted in a decline in industrial roundwood consumption of 5% in the United States in 2020, even though demand for semifinished products such as coniferous sawnwood and panels was surprisingly strong.

In Canada, the decline was predominantly because of a reduction in the use of non-coniferous industrial roundwood by the pulp industry. In the United States, demand for hardwood sawlogs fell dramatically as hardwood lumber production plunged to its lowest level since 2010. Conversely, the consumption of softwood roundwood in the United States has trended upward for the last decade, driven mainly by a

GRAPH 2.8

North America: Coniferous industrial roundwood production, trade and consumption, 2016-2020

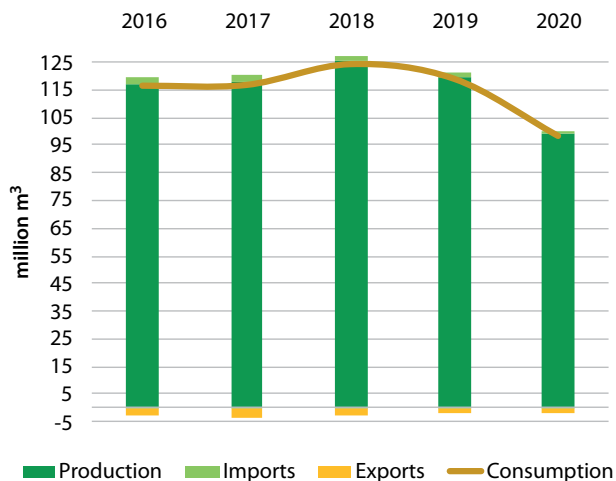


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 2.9

North America: Non-coniferous industrial roundwood production, trade and consumption, 2016-2020

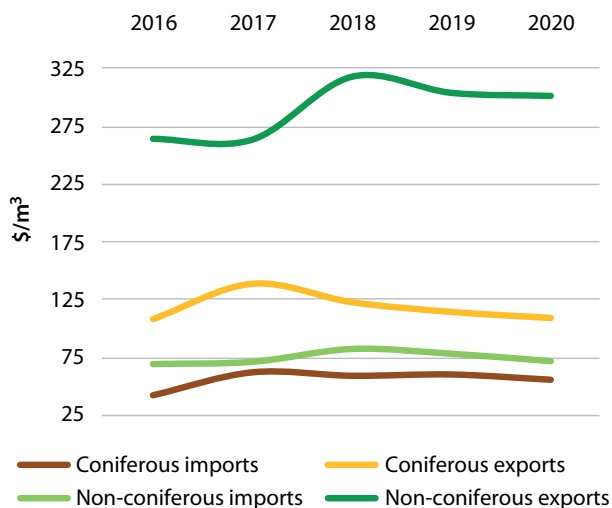


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 2.10

North America: Traded industrial roundwood unit values, 2016-2020



Source: UNECE/FAO database, 2021.

rapidly expanding sawmilling sector in the southern states. As a result, the use of softwood sawlogs increased from about 100 million m³ in 2011 to just over 140 million m³ in 2020.

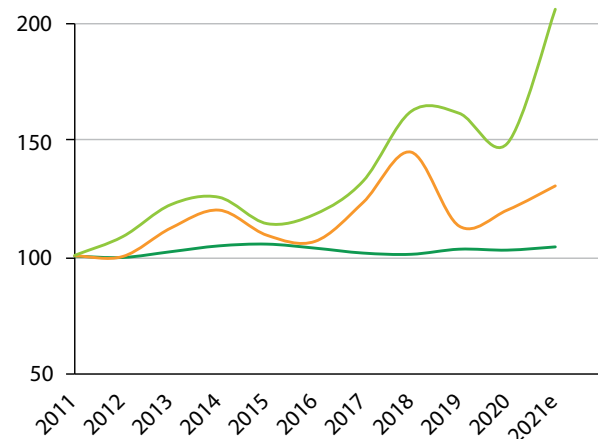
North American declared export unit values decreased by 4.6% (to an average of \$109 per m³) for coniferous and by 0.9% (to an average of \$302 per m³) for non-coniferous industrial roundwood in 2020. Declared unit values for imports decreased by 7.4% (to an average of \$56 per m³) for coniferous and by 7.6% (to an average of \$73 per m³) for non-coniferous industrial roundwood (graph 2.10).

Record-high prices for sawn softwood in the United States in late 2020 and early 2021 (see chapter 3) moved the cost of sawlogs upward throughout North America. The only exception was in the southern United States, where average prices have been practically unchanged for most of the last decade. The most significant sawlog price increases between the first quarter of 2020 and the equivalent period in 2021 were in western Canada and the western United States, where average prices rose by 33% and 20%, respectively (Wood Resource Quarterly, 2021) (graph 2.11).

High demand and rising prices for industrial roundwood in domestic markets resulted in a continued decline in industrial roundwood exports from North America in 2020. The United States exported only 5.6 million m³ of coniferous industrial roundwood in 2020, down by 40% compared with 2016 and the lowest volume in over 30 years. The most significant declines in the five years from 2016 were in exports to Canada (-73%) and China (36%); on the other hand, the volume

GRAPH 2.11

Sawlog price indices for North America, 2011-2021



— US South — Western US — Western Canada

Note: Index 2011 = 100; e = estimate.

Source: Wood Resource Quarterly, 2021.

exported to Japan – the United States' third-largest market – has been relatively stable.

Canadian industrial roundwood exports declined to all its key markets – China, Japan and the United States (in descending order, by volume) – in 2020, continuing a downward trend that started in 2017. For example, Canada's coniferous industrial roundwood exports in 2020 were almost 60% lower than in 2016, and net exports have fallen in the last five years from nearly 4 million m³ to below 1 million m³.

Extraregional influences on the UNECE

Eight of the top ten industrial-roundwood-exporting countries worldwide are in the UNECE region (table 2.2).

A large proportion of globally traded industrial roundwood is destined for one market, China, which imported a record 60.2 million m³ of industrial roundwood in 2020, of which 46.9 million m³ was coniferous. Table 2.3 shows the top ten extraregional industrial roundwood importers in 2020; China imported almost five times more industrial roundwood (by volume) than the other nine countries in the top ten combined.

China's imports of sawn softwood fell by 11% in 2020, and the country's total imports of industrial roundwood and sawnwood (in roundwood equivalent) declined in 2020 for the first time in five years. It has been anticipated that

TABLE 2.2

Top ten industrial roundwood exporters worldwide, 2020

| | Coniferous | Non-coniferous | Total | |
|---------------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| New Zealand | 20,269 | 35 | 20,303 | 2,011 |
| Czech Republic | 17,898 | 265 | 18,163 | 893 |
| Russian Federation | 8,200 | 8,076 | 16,276 | 1,022 |
| Germany | 11,493 | 1,008 | 12,501 | 950 |
| United States | 5,609 | 1,746 | 7,355 | 1,523 |
| Canada | 5,525 | 446 | 5,971 | 349 |
| Australia | 3,422 | 687 | 4,110 | 392 |
| Belgium | 1,936 | 1,801 | 3,737 | 282 |
| Poland | 3,198 | 369 | 3,568 | 291 |
| Norway | 3,352 | 208 | 3,560 | 214 |

Sources: FAOSTAT, 2021; UN Comtrade, 2021; UNECE/FAO database, 2021.



China's shift from importing wood raw material to importing manufactured products would continue but, instead, the decline in sawnwood imports in 2020 was the biggest on record. All the major sawnwood-supplying countries except Germany, Sweden and Ukraine reduced their sales to China in 2020. Exports from the Russian Federation to China declined by 26% for industrial roundwood and by 15% for sawnwood (Wood Resources International, 2021).

TABLE 2.3
Top ten extraregional industrial roundwood importers, 2020

| | Coniferous | Non-coniferous | Total | |
|-----------------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| China | 46,940 | 13,293 | 60,233 | 8,462 |
| Republic of Korea | 3,100 | 147 | 3,247 | 369 |
| India | 1,130 | 1,547 | 2,677 | 588 |
| Viet Nam* | 174 | 2,450 | 2,624 | 722 |
| Japan | 2,070 | 117 | 2,187 | 541 |
| Indonesia* | 1 | 791 | 792 | 55 |
| Egypt* | 221 | 55 | 276 | 48 |
| Malaysia* | 2 | 149 | 150 | 22 |
| Pakistan* | 56 | 158 | 214 | 42 |
| United Arab Emirates | 121 | 26 | 147 | 19 |

Note: * 2019 data; UNECE region countries are not included.

Sources: FAOSTAT, 2021; UN Comtrade, 2021.

The Russian Federation has been a significant industrial roundwood supplier to China in past decades. The relationship could change in 2022, however, if the Russian Federation implements its proposed ban on exports of coniferous industrial roundwood and valuable non-coniferous industrial roundwood while also introducing export taxes on green (undried) sawnwood.

China's log sourcing has shifted from Russian and North American to European suppliers in the last few years as insect- and storm-damaged timber in central Europe has been in temporary abundance. Softwood log imports from Europe increased from 1.3 million m³ in 2018 to 12.3 million m³ in 2020, including 8.5 million m³ from Germany and 2.8 million m³ from the Czech Republic; Russian-supplied

softwood log imports fell from 7.8 million m³ to 4.2 million m³ over the same period.

It is highly unlikely that the large exports from Europe will be economically viable in the long term. According to the study, "Russian Log Export Ban in 2022 – Implications for the Global Forest Industry" (Wood Resources International and O'Kelly Acumen, 2021), China is expected to source more sawlogs from Europe, North America and Oceania in the short term. In the longer term, the study anticipates that China will continue shifting its imports from unprocessed raw material to semifinished products from a range of countries, including the Russian Federation.

UNECE subregional data summary and forecast

Table 2.4 summarizes data on industrial roundwood production, consumption, trade and declared value of cross-border trade. Additional information and the complete forest products database are available at www.unece.org/forests/fpamr2021-annex.

Initial data supplied by UNECE member States (all figures are year-on-year) indicate that removals of industrial roundwood will increase in the UNECE region by 1.2% in 2021 and decrease by 0.6% in 2022. Subregionally, the forecast is for European removals to increase by 0.9% in 2021 and to decrease by 0.8% in 2022; EECCA removals to increase by 1.6% in 2021 and shrink by 3.1% in 2022; and North American removals to increase by 1.2% in 2021 and by 0.6% in 2022.



TABLE 2.4

Industrial roundwood production, imports, exports, net apparent consumption and unit value, UNECE subregions, 2016-2020

| | 2016 | 2017 | 2018 | 2019 | 2020 | Change 2019-2020 |
|--|---------|---------|---------|---------|---------|------------------|
| EUROPE | | | | | | |
| Coniferous | | | | | | |
| Production (1,000 m ³) | 309,977 | 313,600 | 337,813 | 341,595 | 339,049 | -0.7% |
| Imports (1,000 m ³) | 35,585 | 34,127 | 39,603 | 37,502 | 38,777 | 3.4% |
| Exports (1,000 m ³) | 29,283 | 30,844 | 35,870 | 44,491 | 50,387 | 13.3% |
| Consumption (1,000 m ³) | 316,279 | 316,883 | 341,546 | 334,607 | 327,440 | -2.1% |
| Import unit value (\$/m ³) | 69 | 71 | 75 | 67 | 60 | -9.9% |
| Export unit value (\$/m ³) | 70 | 70 | 77 | 69 | 65 | -5.2% |
| Non-coniferous | | | | | | |
| Production (1,000 m ³) | 87,162 | 87,857 | 93,461 | 91,723 | 86,812 | -5.4% |
| Imports (1,000 m ³) | 18,665 | 16,777 | 18,725 | 19,020 | 18,542 | -2.5% |
| Exports (1,000 m ³) | 11,933 | 12,159 | 13,590 | 14,140 | 12,548 | -11.3% |
| Consumption (1,000 m ³) | 93,893 | 92,475 | 98,596 | 96,603 | 92,806 | -3.9% |
| Import unit value (\$/m ³) | 70 | 79 | 85 | 77 | 71 | -7.8% |
| Export unit value (\$/m ³) | 91 | 103 | 110 | 97 | 95 | -2.1% |
| EECCA | | | | | | |
| Coniferous | | | | | | |
| Production (1,000 m ³) | 174,220 | 174,864 | 195,217 | 182,475 | 181,977 | -0.3% |
| Imports (1,000 m ³) | 395 | 390 | 389 | 556 | 365 | -34.4% |
| Exports (1,000 m ³) | 16,424 | 13,025 | 11,168 | 9,365 | 8,507 | -9.2% |
| Consumption (1,000 m ³) | 158,190 | 162,230 | 184,438 | 173,666 | 173,834 | 0.1% |
| Import unit value (\$/m ³) | 90 | 93 | 98 | 82 | 89 | 8.7% |
| Export unit value (\$/m ³) | 68 | 80 | 82 | 73 | 63 | -14.1% |
| Non-coniferous | | | | | | |
| Production (1,000 m ³) | 45,093 | 44,498 | 49,957 | 46,419 | 46,355 | -0.1% |
| Imports (1,000 m ³) | 69 | 84 | 93 | 101 | 122 | 21.1% |
| Exports (1,000 m ³) | 8,631 | 8,393 | 8,153 | 6,895 | 8,400 | 21.8% |
| Consumption (1,000 m ³) | 36,531 | 36,189 | 41,898 | 39,624 | 38,077 | -3.9% |
| Import unit value (\$/m ³) | 75 | 79 | 91 | 88 | 75 | -15.3% |
| Export unit value (\$/m ³) | 50 | 60 | 68 | 65 | 60 | -7.4% |
| NORTH AMERICA | | | | | | |
| Coniferous | | | | | | |
| Production (1,000 m ³) | 411,937 | 409,311 | 422,708 | 407,896 | 400,685 | -1.8% |
| Imports (1,000 m ³) | 5,214 | 3,420 | 4,995 | 3,880 | 4,017 | 3.5% |
| Exports (1,000 m ³) | 17,308 | 16,204 | 17,834 | 13,103 | 11,134 | -15.0% |
| Consumption (1,000 m ³) | 399,842 | 396,527 | 409,869 | 398,673 | 393,567 | -1.3% |
| Import unit value (\$/m ³) | 43 | 62 | 59 | 61 | 56 | -7.4% |
| Export unit value (\$/m ³) | 108 | 138 | 122 | 114 | 109 | -4.6% |
| Non-coniferous | | | | | | |
| Production (1,000 m ³) | 117,233 | 118,194 | 125,431 | 119,623 | 98,920 | -17.3% |
| Imports (1,000 m ³) | 2,219 | 2,027 | 1,915 | 1,806 | 1,472 | -18.5% |
| Exports (1,000 m ³) | 2,911 | 3,398 | 2,929 | 2,366 | 2,192 | -7.4% |
| Consumption (1,000 m ³) | 116,542 | 116,823 | 124,417 | 119,063 | 98,200 | -17.5% |
| Import unit value (\$/m ³) | 70 | 72 | 82 | 79 | 73 | -7.6% |
| Export unit value (\$/m ³) | 264 | 264 | 319 | 305 | 302 | -0.9% |

Note: Unit values are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by the volume of these products.

Sources: FAOSTAT, 2021; UNECE/FAO database, 2021.

A close-up photograph of several stacks of sawnwood planks. The planks are light brown with visible wood grain and are stacked horizontally. The focus is sharp on the edges of the planks in the foreground, while the background is slightly blurred.

Chapter 3

SAWNWOOD

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Introduction and UNECE region overview

COVID-19 has been an unexpected catalyst for surging wood-product demand – first in the United States in mid-2020 and then in other countries around the world. Demand has increased again in 2021.

Sawn softwood. The three UNECE subregions recorded mixed results in sawn softwood consumption in 2020 because of the pandemic, with declines in Europe (-0.4%) and the EECCA (-5.1%) and a gain in North America (+3.5%). The production of sawn softwood was also varied, increasing in Europe (+1.6%) and North America (+0.8%) but decreasing in the EECCA (-5.0%).

In Europe, lower domestic demand and higher production meant that sawn softwood exports increased in volume (by 3.9%) in 2020, to 58.9 million m³, with ample supplies of low-cost beetle-damaged timber enabling central European countries to expand both production and exports. Average export prices increased only slightly overall (+0.8%) in 2020 but rose fast in the second half of the year.

The EECCA produced 47.3 million m³ of sawn softwood in 2020. The subregion's sawn softwood exports declined by 4.4%, to 36.8 million m³; the Russian Federation exported 29.8 million m³ of this product in 2020.

North America produced 101.6 million m³ of sawn softwood in 2020. Exports dropped significantly (by 5.2%), to 28.2 million m³, with declines in both Canada (4.3%, -1.2 million m³) and the United States (-15.2%, -350,000 m³). North American imports increased by 4.3%, to 26.3 million m³. Lumber prices recorded all-time highs in May 2021.

Sawn hardwood. The consumption and production of sawn hardwood in the UNECE region were hit hard by the pandemic in 2020. Apparent consumption declined in the region overall by 18.3% and by 4.8% in Europe, 17.0% in the EECCA and 27.7% in North America.

Sawn hardwood production dropped by 2.9% in Europe in 2020, to 13.5 million m³, and by 15.9% in the EECCA, to 3.64 million m³. Production decreased most in North America, plummeting by 24.7% to 17.7 million m³. The overall decline in the UNECE region was 16.5%.

China continued to dominate imports of temperate and tropical sawnwood in 2020, with a total volume of 33.9 million m³ (valued at \$7.6 billion). UNECE-region countries dominated global exports of sawnwood in 2020, led by Canada and the Russian Federation.

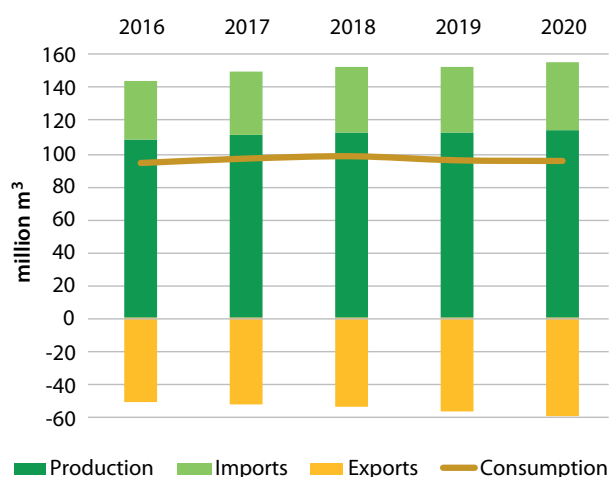
Europe

■ SAWN SOFTWOOD

Despite the COVID-19 pandemic, the production of sawn softwood increased by 1.6% in Europe in 2020, to 114 million m³ (graph 3.1). Production especially increased in the second half of the year after some mills curtailed production in the early months of the pandemic and reduced inventories.

GRAPH 3.1

Europe: Sawn softwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

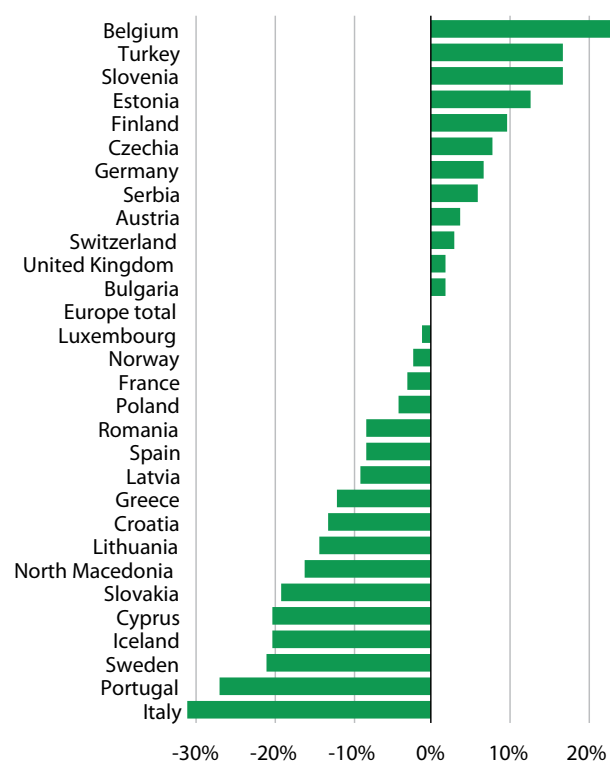
Production volumes varied within the subregion, with most of the increase in 2020 contributed by Germany, where production was up by nearly 2 million m³, partly because of a surplus of salvage logs arising from damage caused by the spruce bark beetle. Production increases were also reported in other central European countries with spruce-bark-beetle outbreaks, such as Austria and the Czech Republic. On the other hand, production was down by 0.7% in Sweden and by 4.2% in Finland, the latter due mainly to mill labour disputes.

European net apparent consumption of sawn softwood declined marginally (by 0.4%) in 2020, to 95.9 million m³. Demand was relatively strong despite the pandemic: the construction market did not suffer much from the lockdowns, and the do-it-yourself sector was strong as people stayed home and focused more than usual on home improvements. With sawmill inventories depleted in 2020, it is likely that actual consumption increased in many countries during the

year. Among the big importers, Italy clearly suffered from the pandemic, with apparent consumption down by 30%; on the other hand, consumption rose by 1.6% in the United Kingdom. There were large variations among countries in the extent of change in apparent consumption in 2020 (graph 3.2). The pandemic has caused a severe imbalance between supply and demand, which is still visible in the European and global markets in 2021.

GRAPH 3.2

Europe: Change in sawn softwood consumption, by country, 2019-2020



Note: Countries with unchanged apparent consumption are not shown.

Source: UNECE/FAO database, 2021.



The European sawnwood trade was again very export-driven in 2020, with overseas markets developing dynamically. Exports of sawn softwood increased by more than 2.02 million m³, with roughly half the increase shipped to China and the other half to the United States. Major contributors to the increase in exports were Sweden (+10.9%, or 1.4 million m³) and Germany (+8.2%, or 0.7 million m³). Overall, Europe increased exports of sawn softwood to China and gained market share, despite a drop in total Chinese imports. European exports of sawn softwood declined to Japan by 7% and to North Africa by 13%. Overall European imports were steady in 2020 (Woodstat AB, 2021).

Average annual unit values were steady in 2020 for European sawn softwood exports and imports, but the negative price trend that started in 2018 changed direction in 2020. Prices started to surge in Europe towards the end of 2020, partly in response to escalating prices in North America. In some markets, prices for European sawn softwood more than doubled in the third quarter of 2020 compared with those in the second quarter.

Production and demand were still strong for sawn softwood in the early months in 2021. Supply has been tight and German buyers reported shortages; sawlog supply has become a concern. Germany recorded an all-time-high production volume in the first quarter of 2021, at 6.5 million m³, and Sweden had its highest-ever monthly production in March 2021, at 1.9 million m³ (Svenskt Trä, 2021). Despite high production, stock volumes remained low.

Demand for European sawn softwood was strong in the United States in January-May 2021, with exports up by 33%; intra-European exports also increased. On the other hand, exports to China, Japan and North Africa were well down compared with 2020. Europe exported more sawn softwood to the United States than to China in the first five months of 2021 (Timber online, 2021a).

■ SAWN HARDWOOD

As a result of the pandemic, sawn hardwood consumption in Europe declined by 4.8% in 2020, to 13.6 million m³, and production dropped by 2.9%, to 13.5 million m³ (graph 3.3). About one-third of countries in the subregion recorded declines in sawn hardwood production, but available data indicate that there were gains in Bosnia and Herzegovina (+33%), Turkey (+4.8%) and Romania (+0.9%) – the three largest producers in the subregion.

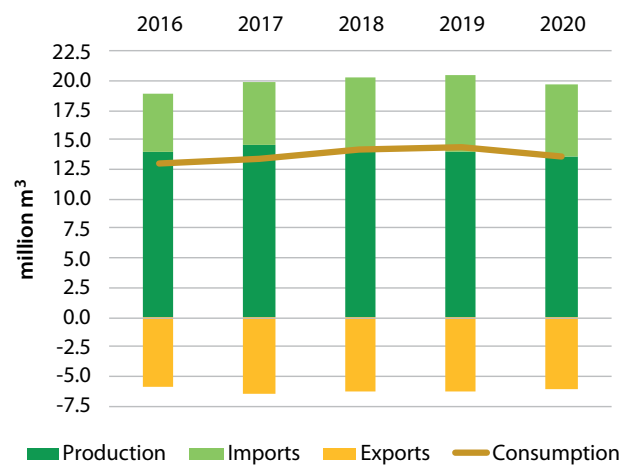
European sawn hardwood exports dropped by 3.2% in 2020 due to slowing consumption in most countries in the subregion, and imports dropped even more (by 7.2%) due to the pandemic.

Sawn hardwood import unit values were stable in 2020 (down by 0.6% compared with 2019), and export unit values

decreased by 4.2% (graph 3.4). European hardwood sawmills are highly dependent on the international hardwood market (about 45% of production is exported). At the same time, a significant amount of hardwood lumber is imported: about 45% of wood consumption in Europe originates in another country.

GRAPH 3.3

Europe: Sawn hardwood production, trade and consumption, 2016-2020

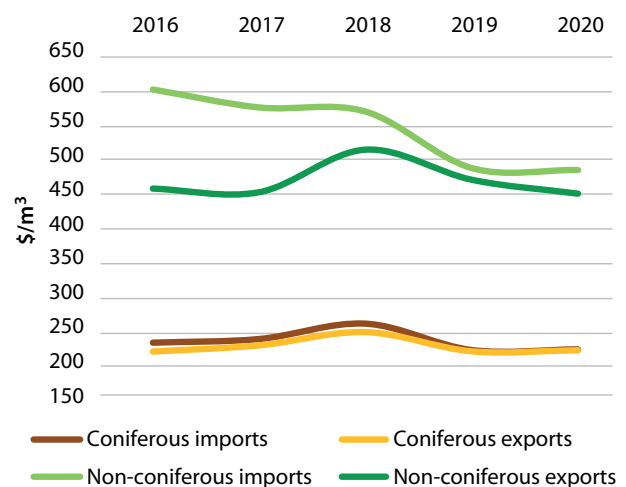


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 3.4

Europe: Traded sawnwood unit value, 2016-2020



Source: UNECE/FAO database, 2021.

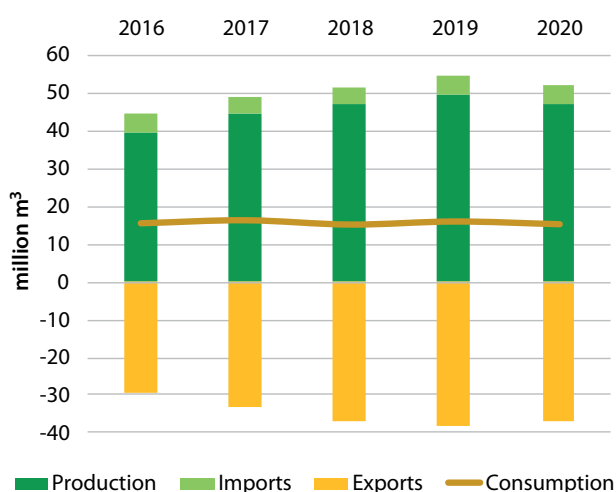
Eastern Europe, Caucasus and Central Asia

■ SAWN SOFTWOOD

The EECCA subregion produced 47.3 million m³ of sawn softwood in 2020, a drop of 5.0% over 2019 (graph 3.5). Production declined by 5.7% in the Russian Federation, to 38.9 million m³. Apparent sawn softwood consumption decreased in the EECCA by 5.1% in 2020, to 15.1 million m³, and exports dropped by 4.4%, to 36.8 million m³. Export unit prices for sawn softwood were stable in 2020, at \$133 per m³ (graph 3.7).

GRAPH 3.5

EECCA: Sawn softwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.



Russian sawn softwood producers successfully handled the restrictions imposed by measures to mitigate the spread of COVID-19, such as a lockdown by the Russian government in the second quarter of 2020. Large sawmills did not stop production completely but reduced volumes slightly over the year. Transport restrictions and an increase in container rates further reduced shipments of sawn timber from the Russian Federation, with exports falling by 5.2%, to 29.8 million m³ (WhatWood, 2021b, c).

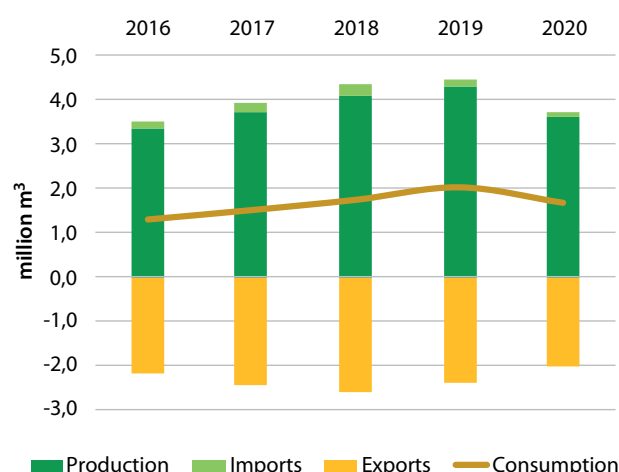
The volume of Russian sawn softwood sales to non-EECCA countries decreased strongly (by 9%) in 2020, to 23.8 million, while exports to countries in the subregion increased by 16%, to 6.0 million m³. Key export markets in 2020 were China (18.1 million m³, down by 12%), Uzbekistan (2.7 million m³, up by 9%), Azerbaijan (1 million m³, up by 7%) and Egypt (0.96 million m³, down by 16%) (WhatWood, 2021d).

■ SAWN HARDWOOD

Sawn hardwood production and consumption in the EECCA contracted by 15.9% (to 3.6 million m³) and 17.0% (to 1.7 million m³), respectively, in 2020. Sawn hardwood exports from the EECCA amounted to 2.0 million m³ (down by 15.3% compared with 2019) (graph 3.6), even though unit values for exported sawn hardwood dropped by 4.5% (graph 3.7). The Russian Federation exported 1.5 million m³ of sawn hardwood in 2020 (down by 18.2%).

GRAPH 3.6

EECCA: Sawn hardwood production, trade and consumption, 2016-2020

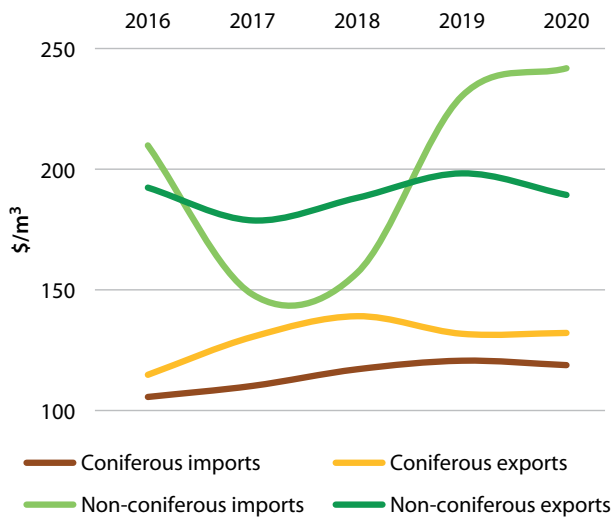


Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

GRAPH 3.7

EECCA: Traded sawnwood unit value, 2016-2020



Source: FAOSTAT, 2021.

North America

North American production of sawn softwood increased by 0.8% in 2020, to 101.6 million m³. Sawn hardwood production fell dramatically (by 24.7%), however, to 17.7 million m³. The net apparent consumption of sawn softwood and sawn hardwood combined decreased by 2.0% in 2020, and the export volume dropped by 5.2% for sawn softwood and by 7.0% for sawn hardwood.

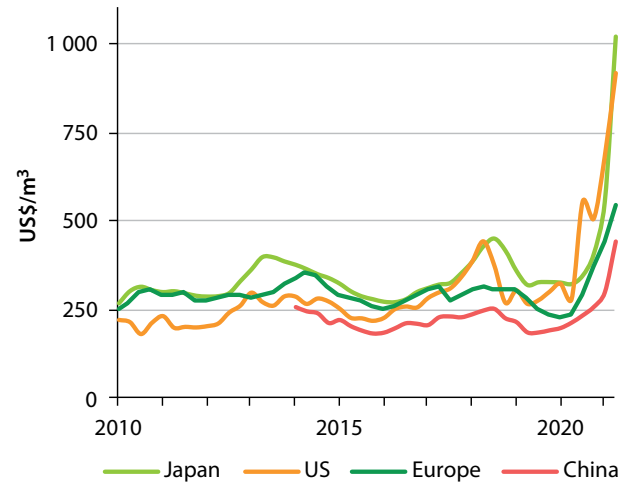
■ SAWN SOFTWOOD

The onset of the pandemic caused sawn softwood demand in North America to plummet in March 2020 before a surge of do-it-yourself demand across the subregion. Many sawmills went into voluntary curtailment until customers started ordering more sawnwood in April 2020, when the market came back to life. Coupled with an upswing in new-home building, sawn softwood demand has continued to accelerate in 2021, with record prices achieved through to late May (graph 3.8). The bellwether price of the spruce-pine-fir assortment (SPF, FOB British Columbia) (W-SPF 2x4 #2&Better) peaked at \$1,630 per Mbf (\$1,050/m³, net), almost \$1,000 per Mbf (\$650 per m³) above the previous record set in 2018 (Random Lengths, 2021a). W-SPF prices plunged thereafter, declining to only \$500 per Mbf (\$325 per m³) in late July 2021 (not shown in graph 3.8).

United States residential construction markets sparked a surge in demand as the pandemic caused central-city

GRAPH 3.8

Quarterly prices for sawn softwood in China, Europe, Japan and the United States, 2010-June 2021



Note: Data to June 2021, delivered-to-market prices. Japan: BC W-SPF 2x4, J-grade, C&F; Europe: Swedish spruce 47x100, C&F; United States: 2x4 W-SPF #2&Better, KD, S4S, Random Length (8'-16' and longer); China: SPF/Hem-Fir, green, grade #3&Btr 1-7/8x4-12, C&F.

Sources: Random Lengths, 2021a; Russ Taylor Global, 2021.

dwellers in apartments to flee to suburbs for the safety of detached homes complete with backyards, home offices and workout spaces and better-suited to the home-schooling of children. New residential housing starts increased by 6.9% in 2020, surging even faster in the second half of the year and into 2021 (US Census Bureau, 2021a). Sales of new and existing homes, as well as home prices, skyrocketed as a result and continued to increase through to the middle of 2021 (US Census Bureau, 2021b).

Robust repair and remodelling (R&R) activity since the start of the pandemic continued through to the end of May 2021 before a slowdown (Harvard Joint Center for Housing Studies, 2021a). Do-it-yourself consumers at big-box stores (e.g. Home Depot and Lowes) became wary of the exorbitant prices of building materials; moreover, with half the United States population vaccinated by June 2021, consumers were able to choose to spend disposable income on travel and entertainment rather than their homes. Nevertheless, R&R activity is expected to increase in the fourth quarter of 2021 as larger projects involving contractors commence.

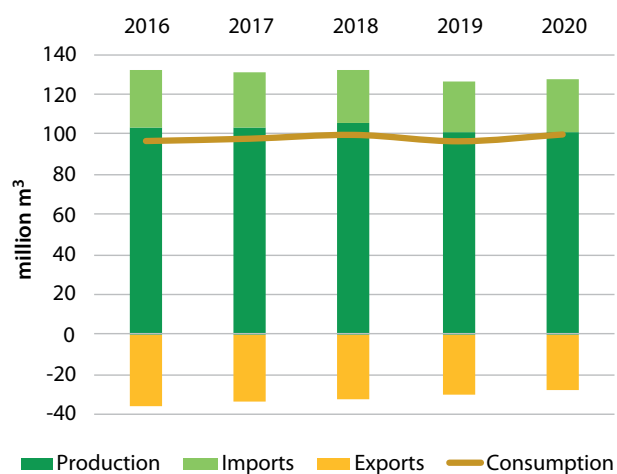
Countervailing and antidumping duties continue to be imposed on Canadian sawn softwood exports to the United States, although high prices have allowed the duties to be passed on to consumers rather than absorbed by mills. The import duty will be 9% for most of 2021 but, based on the Second Administrative Review by the United States

Department of Commerce, it will rise to over 18% at the end of the year (Global Affairs Canada, 2021). With high sawnwood prices, there is less urgency for either country to negotiate a new agreement. However, pressure from the National Association of Home Builders and other lobby groups suggests that the import duties are only raising the cost of lumber in a supply shortage, and this is being passed on entirely to consumers.

The net apparent consumption of sawn softwood in North America increased by 3.5% in 2020, to 99.7 million m³, while the export volume dropped by 5.2% (graph 3.9). Canada recorded a drop in offshore exports of 28.7% in 2020 but managed a small gain of 0.2% to the United States; China and Japan represent 80% of Canada's offshore exports. United States exports declined by 15.2% due to strong domestic prices.

GRAPH 3.9

North America: Sawn softwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

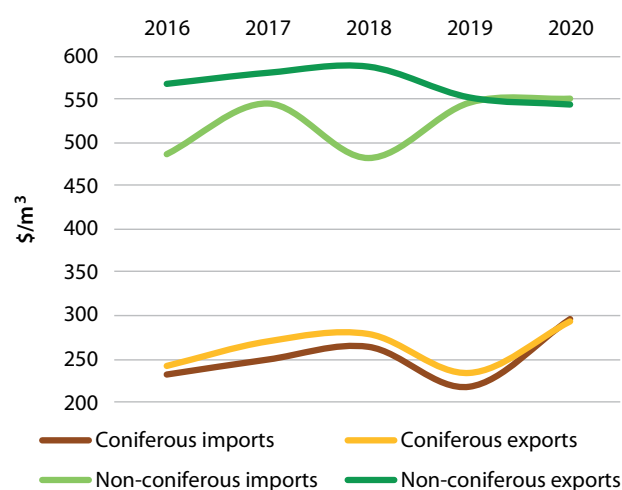
Source: UNECE/FAO database, 2021.

North American imports of sawn softwood increased by 4.3% in 2020 as strong domestic prices favoured imports and discouraged exports. United States imports grew by 4.5%, with large gains for European product; nevertheless, Canada still dominated supply.

Declared unit prices for Canadian and United States sawn softwood exports and imports declined in the first half of 2020 and soared in the second half of the year. Consequently, prices remained essentially unchanged in 2020 compared with 2019 (graph 3.10).

GRAPH 3.10

North America: Traded sawnwood unit value, 2016-2020



Source: UNECE/FAO database, 2021.

SAWN HARDWOOD

North American sawn hardwood production decreased by 5.79 million m³ (24.7%) in 2020, while apparent consumption declined by 5.68 million m³ (27.6%) (graph 3.11). These changes coincided with drops of 0.19 million m³ (13.5%) in imports and 0.30 million m³ (7.0%) in exports. The declines were associated with lower prices for higher-quality hardwood sawn products used in appearance applications (e.g. cabinets, furniture, millwork and flooring), as well as in industrial applications (pallets and sleepers) and exported sawn products.

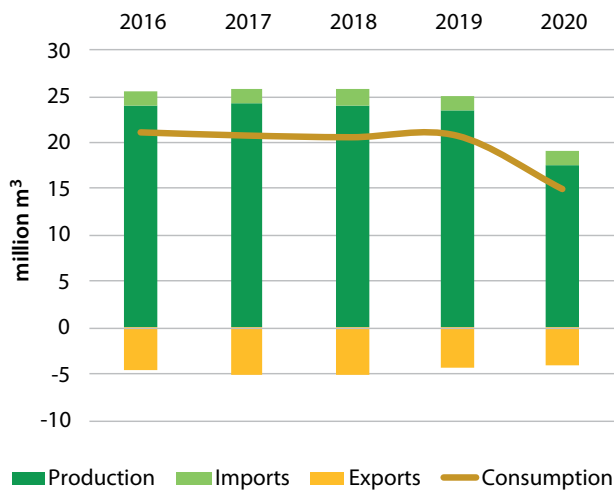
Apparent sawn hardwood consumption declined in the United States and Canada in 2020. Apparent United States consumption of sawn hardwood was down for both industrial and appearance applications. Reactions by market actors to the pandemic caused a reduction in appearance-based demand as well as product manufacturing in the second and third quarters of 2020. Although housing starts realized large increases in the second half of 2020, there can be a time lag between initial home construction and the installation of hardwood flooring and cabinets. A large proportion of the projected increase in apparent consumption in the United States market in 2021 is associated with anticipated increases in kitchen-cabinet and flooring demand.

The decline in sawn hardwood consumption by industrial users in both pallet and sleeper production was also influenced by lower demand by industrial consumers. This had a negative impact on producers at the beginning of the COVID-19 outbreak and affected United States industrial

output both at that time and during the recovery towards the end of 2020 (Federal Reserve Bank of St. Louis, 2020). Wood consumption in United States sleeper production in 2020 continued a decline that began in 2017 (Hardwood Market Report, 2021).

GRAPH 3.11

North America: Sawn hardwood production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

United States imports of temperate sawn hardwood dropped by 11.2% in 2020 because of a continued reduction in interregional trade between the United States and Canada. Imports of tropical sawn hardwood into the United States were down by more than 34.1%, with both the United States and Canada experiencing large declines.

Although North American imports of sawn hardwood declined in 2020 to levels last seen in 2012, United States imports of ipé (*Handroanthus lapacho*) increased in both volume and value between 2019 and 2020. In volume terms, ipé displaced balsa as the most important tropical timber import. It accounted for 37% of United States tropical imports by value in 2020 and 20% of total sawn hardwood imports.

The decline in North American exports of sawn hardwood in 2020 was the result of decreased United States and Canadian production and shipments (USDA, 2021; Statistics Canada, 2021a). The largest decline in United States trade was a 19.1% reduction in exports to Canada, while United States exports to Viet Nam and China increased by 2.1% and 1.4%, respectively. The decline in United States exports to Canada and an increase in United States exports to Viet Nam meant that Viet Nam was the second-largest market for United States sawn hardwoods in 2020 behind China. The value of Canadian exports to China declined by over 30%.

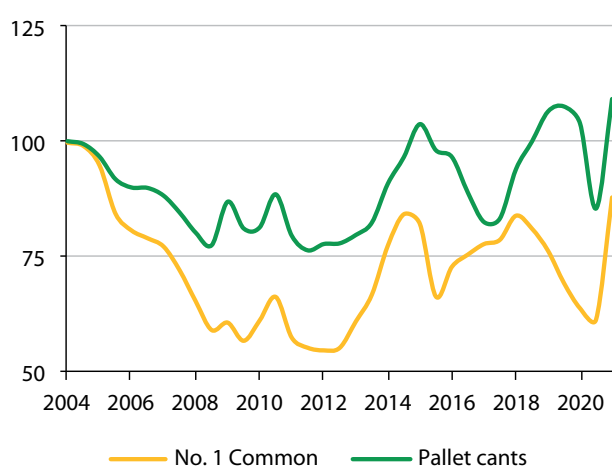
The price of sawn hardwoods used in appearance applications is reflected in the movement of the aggregate (multi-species) price index of mid-grade or Number 1 Common (1C) boards shown in graph 3.12. The index was developed from the Hardwood Market Report for the central United States, deflated by the United States producer price index (US BLS, 2021b).



The index shows a significant decline in price for 1C lumber and pallet cants through 2020 and then a sharp increase in the first half of 2021 as both domestic and international markets rebounded after the pandemic-influenced decline. Pandemic-related production and supply-chain disruptions also affected supply.

GRAPH 3.12

Price indices for sawn hardwood products in the United States, first-half 2004 to first-half 2021



Note: Semi-annual inflation-adjusted Index, January 2004=100.

Sources: Luppold and Bumgardner, 2016; Hardwood Market Report, 2021.

Extraregional influences on the UNECE

China remains a powerhouse in the global sawnwood trade, importing considerably more sawnwood in 2020 than the next top nine extraregional importers combined (table 3.1). United States exports of sawn hardwood to China dropped by 786,000 m³ (39%) in 2020 but increased to Viet Nam by 16,000 m³ (3%) (ITTO, 2021a).

Globally, eight of the top ten sawnwood exporters in 2020 were in the UNECE region, with Chile and Thailand the only countries outside the region in the top ten (table 3.2).

Asia is the main driver of the world's tropical sawnwood trade, accounting for 86% of imports and 61% of exports by volume. China and to a lesser extent Viet Nam, India and Thailand are the major importers and Thailand and Malaysia are the major exporters. African suppliers – particularly Cameroon and Gabon – are also important in the tropical sawnwood trade, and Brazil has emerged recently as a major exporter.

TABLE 3.1

Top ten extraregional sawnwood importers, 2020

| | Coniferous | Non-coniferous | Total | |
|-------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| China | 26,078 | 9,071 | 33,867 | 7,645 |
| Japan | 4,888 | 195 | 5,083 | 1,728 |
| Mexico | 2,679 | 252 | 2,931 | 466 |
| Egypt | 2,378 | 297 | 2,675 | 737 |
| Viet Nam* | 777 | 1,880 | 2,657 | 1,439 |
| Republic of Korea | 1,825 | 213 | 2,037 | 576 |
| Saudi Arabia* | 1,822 | 58 | 1,880 | 403 |
| Algeria* | 1,563 | 52 | 1,616 | 324 |
| Morocco* | 918 | 78 | 997 | 281 |
| India | 610 | 280 | 890 | 356 |

Note: * 2019 data; UNECE region countries are not included.

Sources: UN Comtrade, 2021; FAOSTAT, 2021.

TABLE 3.2

Top ten sawnwood exporters globally, 2020

| | Coniferous | Non-coniferous | Total | |
|--------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| Russian Federation | 29,833 | 1,544 | 31,377 | 4,227 |
| Canada | 26,243 | 495 | 26,738 | 7,742 |
| Sweden | 13,976 | 37 | 14,013 | 3,370 |
| Germany | 9,618 | 688 | 10,306 | 2,550 |
| Finland | 8,198 | 20 | 8,218 | 1,775 |
| Austria | 5,939 | 140 | 6,079 | 1,426 |
| United States | 1,959 | 3,511 | 5,470 | 2,721 |
| Belarus | 3,937 | 159 | 4,096 | 503 |
| Thailand* | - | 3,924 | 3,924 | 1,048 |
| Chile* | 3,663 | 13 | 3,676 | 817 |

Note: * 2019 data.

Sources: UN Comtrade, 2021; FAOSTAT, 2021; UNECE/FAO database, 2021.

UNECE imports of tropical sawnwood comprised 12% of world imports by volume in 2020; United States imports were minimal, however, at 0.161 million m³, which is less than 2% of the world total. Tropical sawnwood imports by UNECE countries were more affected by supply than demand in the first quarter of 2021, with supply tightened by a chronic shortage of container space and soaring freight rates caused by pandemic-related supply-chain disruptions (ITTO, 2021b).

China is the largest tropical sawnwood importer by a big margin, absorbing 63% of world imports by volume in 2020, up by 9% compared with 2019. Demand for tropical sawnwood has been driven by a decline in the availability of tropical logs, with producer countries imposing restrictions on log exports; moreover, rising manufacturing costs in China have increased the competitiveness of tropical sawnwood imports. With the COVID-19 virus effectively controlled in China in the first quarter of 2020, China's economy recovered more strongly than other importing countries; by the first quarter of 2021, measures to rebuild the economy had led to a rebound in construction activity and a resumption of imports.

Viet Nam's tropical sawnwood imports increased by 15% in 2020, to 0.67 million m³. The country's successful early control of the pandemic enabled the secondary processed wood products sector to respond as export demand recovered more rapidly than expected in the United States, which is the major market for Viet Nam's wooden furniture exports.

Thailand was the top-ranked exporter of tropical sawnwood – mostly plantation rubberwood – in 2020, although the volume declined marginally compared with 2019, to 3.6 million m³. The sawmilling industry was severely affected by restrictions in the first half of 2020 designed to control COVID-19, but production and exports both recovered in the second half of the year. Malaysia's sawnwood exports contracted by one-third in 2020, and production levels had not reached pre-pandemic levels by early 2021. The country's exports have been affected by raw-material shortages, escalating freight rates and shortages of containers and skilled labour (ITTO, 2021b).

Cameroon's export volumes dropped in 2020, to 0.94 million m³. The industry was affected by COVID-19 safe-work practices, extended lead times to the market, crackdowns on illegal activities, and logistical problems in delivering logs to sawmills (ITTO, 2020).

In contrast to all other major tropical sawnwood exporters, the volume of Brazil's exports more than doubled in 2020 compared with 2019, reaching 0.8 million m³. The surge in exports followed the relaxation of controls on timber exports from the states of Amazonas and Pará (ITTO, 2021a).

UNECE subregional data summary and forecast

Table 3.3 summarizes data on sawnwood production, consumption, trade and the declared value of cross-border trade. Additional information and the complete forest products database are available at www.unece.org/forests/fpamr2021-annex.

Initial data supplied by UNECE member States (all figures are year-on-year) indicate that the production of sawnwood will increase in the UNECE region by 3.9% in 2021 and by 2.4% in 2022. Subregionally, the forecast is for Europe to increase by 3.9% in 2021 and by 1.2% in 2022; the EECCA to increase by 3.0% in 2021 and by 5.1% in 2022; and North America to grow by 4.2% in 2021 and by 2.5% in 2022.



TABLE 3.3

Sawnwood production, imports, exports, net apparent consumption and traded unit value, UNECE subregions, 2016-2020

| | 2016 | 2017 | 2018 | 2019 | 2020 | Change 2019 to 2020 |
|--|---------|---------|---------|---------|---------|---------------------|
| EUROPE | | | | | | |
| Sawn softwood | | | | | | |
| Production (1,000 m ³) | 108,418 | 110,972 | 112,771 | 112,287 | 114,040 | 1.6% |
| Imports (1,000 m ³) | 35,975 | 38,562 | 40,073 | 40,736 | 40,774 | 0.1% |
| Exports (1,000 m ³) | 49,872 | 52,040 | 53,790 | 56,702 | 58,919 | 3.9% |
| Consumption (1,000 m ³) | 94,521 | 97,493 | 99,054 | 96,321 | 95,895 | -0.4% |
| Import unit value (\$/m ³) | 227 | 232 | 253 | 217 | 218 | 0.4% |
| Export unit value (\$/m ³) | 213 | 223 | 243 | 214 | 215 | 0.8% |
| Sawn hardwood | | | | | | |
| Production (1,000 m ³) | 13,913 | 14,461 | 14,188 | 13,913 | 13,515 | -2.9% |
| Imports (1,000 m ³) | 4,960 | 5,320 | 6,117 | 6,634 | 6,155 | -7.2% |
| Exports (1,000 m ³) | 5,841 | 6,465 | 6,201 | 6,240 | 6,043 | -3.2% |
| Consumption (1,000 m ³) | 13,031 | 13,315 | 14,104 | 14,307 | 13,627 | -4.8% |
| Import unit value (\$/m ³) | 596 | 570 | 564 | 482 | 479 | -0.6% |
| Export unit value (\$/m ³) | 451 | 446 | 506 | 463 | 444 | -4.2% |
| EECCA | | | | | | |
| Sawn softwood | | | | | | |
| Production (1,000 m ³) | 39,689 | 44,551 | 47,144 | 49,815 | 47,346 | -5.0% |
| Imports (1,000 m ³) | 4,781 | 4,720 | 4,600 | 4,565 | 4,527 | -0.8% |
| Exports (1,000 m ³) | 29,099 | 33,006 | 36,754 | 38,482 | 36,787 | -4.4% |
| Consumption (1,000 m ³) | 15,372 | 16,265 | 14,990 | 15,898 | 15,087 | -5.1% |
| Import unit value (\$/m ³) | 106 | 111 | 117 | 121 | 119 | -1.4% |
| Export unit value (\$/m ³) | 116 | 131 | 139 | 132 | 133 | 0.3% |
| Sawn hardwood | | | | | | |
| Production (1,000 m ³) | 3,381 | 3,718 | 4,121 | 4,329 | 3,639 | -15.9% |
| Imports (1,000 m ³) | 111 | 236 | 241 | 124 | 97 | -21.5% |
| Exports (1,000 m ³) | 2,176 | 2,427 | 2,607 | 2,418 | 2,047 | -15.3% |
| Consumption (1,000 m ³) | 1,317 | 1,527 | 1,756 | 2,036 | 1,690 | -17.0% |
| Import unit value (\$/m ³) | 210 | 149 | 157 | 230 | 242 | 5.0% |
| Export unit value (\$/m ³) | 192 | 179 | 188 | 198 | 189 | -4.5% |
| NORTH AMERICA | | | | | | |
| Sawn softwood | | | | | | |
| Production (1,000 m ³) | 103,788 | 103,892 | 105,696 | 100,837 | 101,618 | 0.8% |
| Imports (1,000 m ³) | 28,031 | 27,624 | 26,278 | 25,174 | 26,261 | 4.3% |
| Exports (1,000 m ³) | 35,413 | 33,946 | 32,516 | 29,740 | 28,202 | -5.2% |
| Consumption (1,000 m ³) | 96,405 | 97,571 | 99,458 | 96,271 | 99,677 | 3.5% |
| Import unit value (\$/m ³) | 232 | 249 | 264 | 218 | 297 | 36.3% |
| Export unit value (\$/m ³) | 241 | 270 | 279 | 233 | 294 | 26.2% |
| Sawn hardwood | | | | | | |
| Production (1,000 m ³) | 24,101 | 24,343 | 23,905 | 23,462 | 17,673 | -24.7% |
| Imports (1,000 m ³) | 1,557 | 1,564 | 1,779 | 1,652 | 1,383 | -16.3% |
| Exports (1,000 m ³) | 4,493 | 5,086 | 5,046 | 4,308 | 4,006 | -7.0% |
| Consumption (1,000 m ³) | 21,165 | 20,822 | 20,639 | 20,805 | 15,049 | -27.7% |
| Import unit value (\$/m ³) | 486 | 545 | 482 | 546 | 550 | 0.9% |
| Export unit value (\$/m ³) | 567 | 580 | 587 | 551 | 543 | -1.5% |

Note: Sawnwood data for 2016 do not include sleepers. Unit values are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by the volume of these products.

Sources: UNECE/FAO database, 2021; FAOSTAT 2021.

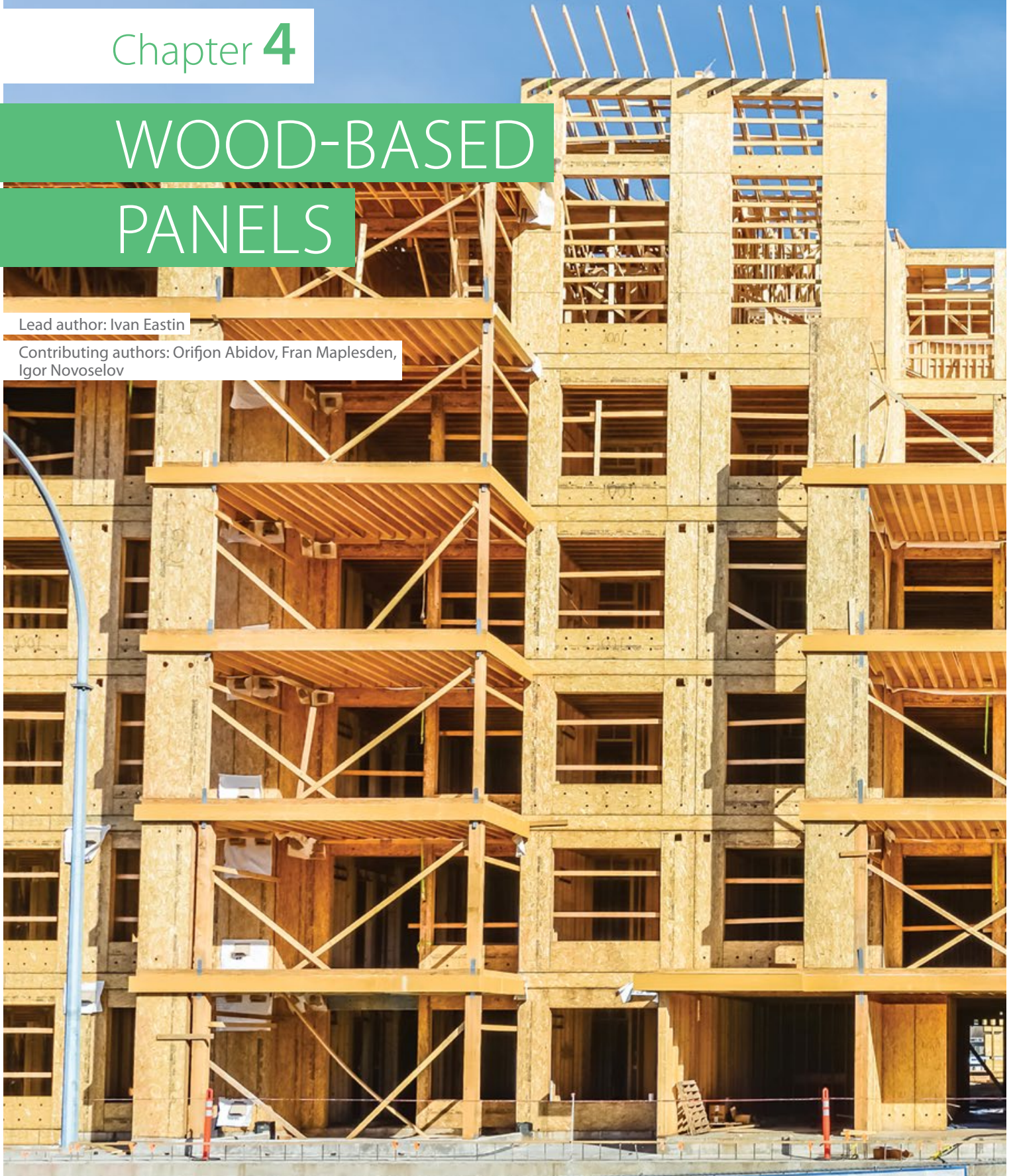


Chapter 4

WOOD-BASED PANELS

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Introduction and UNECE region overview

The wood-based panels sector in the UNECE continued to decline in 2020. Panel production decreased by 3.3% overall and apparent consumption was down by 4.3%, due mainly to the impact of the COVID-19 pandemic on the region's economies. The consumption of structural panels fell by 2.2%, while the consumption of non-structural panels dropped by 5.6%.

Total wood-based panel production in Europe registered a better performance (3.1%) than real GDP in the EU27 (-6.1%) in 2020, driven by a relatively stable construction sector and a strong recovery in furniture production in the second half of the year. Higher output of oriented strandboard (OSB) (+3.5%) partly offset drops in the production of other panel types. The outlook for 2021 is upbeat, with growth of 5.8% forecast in Europe for wood-based panels production, given political support for increasing the use of wood in construction embodied in initiatives such as the European Green Deal, the Renovation Wave and the New European Bauhaus.

The apparent consumption of wood-based panels decreased by 6.7% in the EECCA in 2020, to 19.0 million m³, and production declined by 3.4%, to 23.4 million m³. The production of wood-based panels fell by -1.0% in the Russian Federation, to 17.4 million m³.

The apparent consumption of wood-based panels declined by 3.3% in North America in 2020, despite a recovery in housing starts and remodelling activities in the United States. Production capacity increased slightly (by 0.3%) in the North American structural panel industry in 2020, although capacity utilization decreased from 75.3% in 2019 to 74.5% in 2020. Pandemic-related impacts on supply chains, coupled with strong demand, caused prices for structural panels to soar to record levels.

Imports of tropical plywood by Japan, the world's largest importer of this product, contracted in volume by 29% in 2020, while the share of domestic plywood increased to 67% of total plywood consumption. In contrast to other major exporters (China, Indonesia and Malaysia), the volume of Viet Nam's tropical plywood exports rose significantly (by 32%) in 2020 in response to growth in demand in the United States, the major market.

Europe

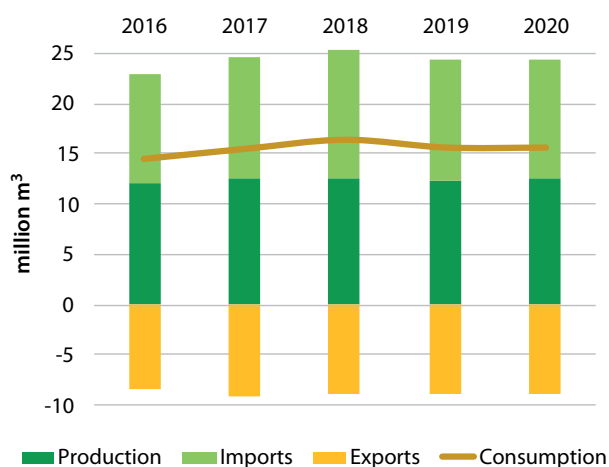
Total wood-based panels production decreased by 3.1% in Europe in 2020, to 71.6 million m³, which was still a much better performance than the 6.1% contraction of real GDP in the EU27 in 2020. A relatively resilient construction output and a strong recovery in furniture production in the second half of 2020 supported demand for wood-based panels in 2020. Strong growth in the production of oriented strandboard (OSB) (+3.5%) and softboard (+5.7%) as a subcategory of fibreboard (+1.9%) partly offset declines in the output of other panel types.

The furniture industry remained the largest end-user of wood-based panels in the European subregion in 2020, despite contractions in furniture production and construction output (see chapters 1 and 7). Forty-seven percent of overall wood-based panels production in Europe went to the furniture sector in 2020 (compared with 49% in 2019). The building industry, including doors and flooring applications, accounted for 38% of overall production. The remaining demand for wood-based panels went to packaging (4%) and other applications, such as moulding and do-it-yourself (11%) (EPF, 2021).

The construction industry in Europe was less affected than the furniture end-use sectors during the pandemic crisis, enabling the structural panels market there to grow slightly (by 1.4%), in contrast to a decline of 2.8% for non-structural panels (EPF, 2021). Graph 4.1 summarizes structural panels

GRAPH 4.1

Europe: Structural panels production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

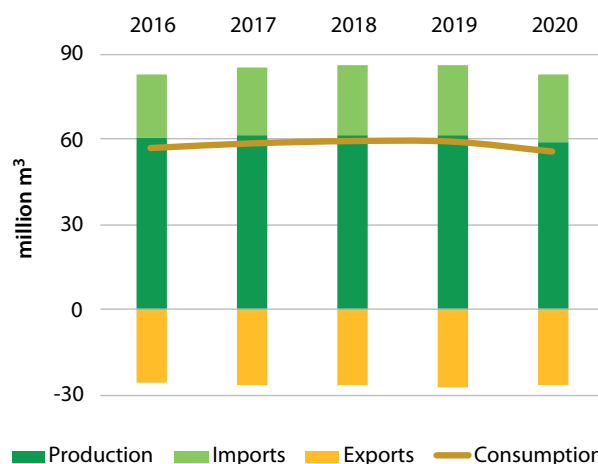
production, trade and consumption between 2016 and 2020, and graph 4.2 presents data for non-structural panels.

The outlook for the European wood-based panels industry in 2021 appears favourable thanks to political support (as outlined in chapter 1) for increasing the use of wood in construction (e.g. via the European Green Deal, the European Renovation Wave and the New European Bauhaus). At the same time, household furniture is benefiting from strong demand as people shift increasingly to home-working in response to the COVID-19 pandemic.

The European Panel Federation (EPF) forecasts that wood-based panels production in the subregion will rise by 5.8% in 2021, the highest rate in the last ten years. Unit values increased for both imports and exports of non-structural panels in 2020 but decreased for structural panels (graph 4.3).

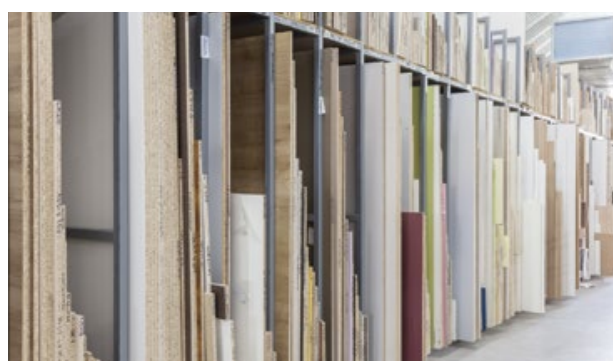
GRAPH 4.2

Europe: Non-structural panels production, trade and consumption, 2016-2020



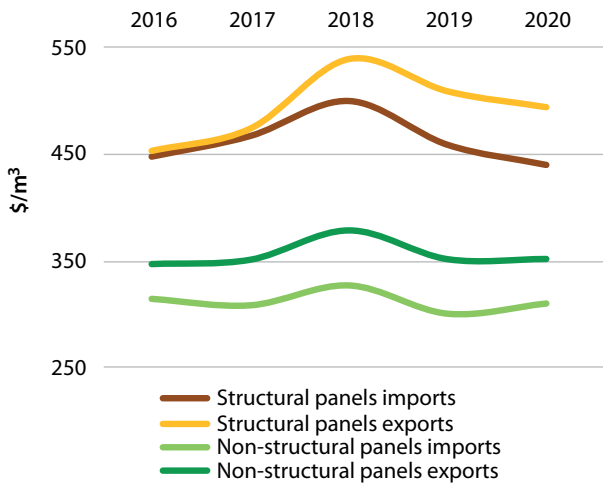
Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.



GRAPH 4.3

Europe: Traded wood-based panels unit values, 2016-2020



Source: UNECE/FAO database, 2021.

Eastern Europe, Caucasus and Central Asia

The wood-based panels sector was one of the less-affected industries in the EECCA in 2020. Challenges arose in selling finished products, however, primarily for producers of plywood, other wood-based panels and furniture. The production of furniture and wood-based panels dropped by 40-50% in the Russian Federation during a COVID-19 lockdown in April-May 2020. Several wood-based panel manufacturing plants shut down completely. Many enterprises used the downtime for preventive maintenance, which made the best of a bad situation and helped avoid additional employee layoffs. The net result was that forest product production, including panels, rebounded strongly in the last quarter of 2020, almost making up for the declines experienced in the second and third quarters.

A large shortage of particle board/laminated particle board, medium-density fibreboard (MDF), high-density fibreboard (HDF) and flooring materials occurred in the Russian market in the third quarter of 2020. According to WhatWood (2021e) estimates, the particle-board shortage amounted to 30,000-40,000 m³ per month. The shutdown of several producers for reasons unrelated to the pandemic also contributed to the shortage, causing prices to roughly double in August.

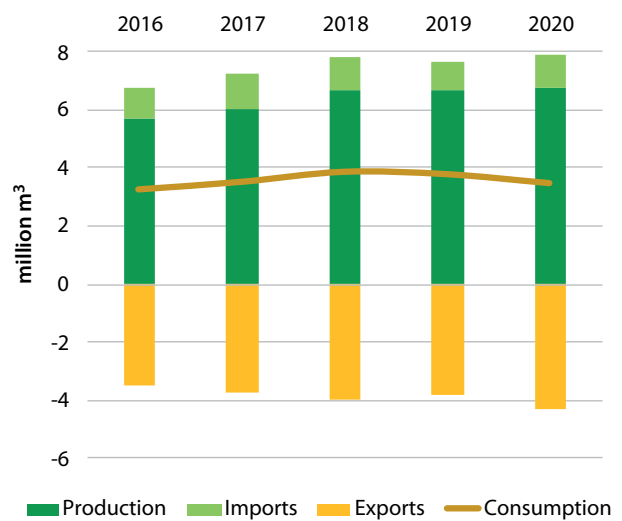
The increased demand for wood-based panels was the result of two factors: seasonal demand, and demand unique to 2020. Typically, demand for wood-based panels, furniture and

decorative elements increases at the end of the construction season and on the commissioning of housing towards the end of each year. Atypically, in 2020, there was pent-up demand for wood-based panels in the furniture sector stemming from earlier pandemic restrictions as well as unused disposable household income that was not spent on travel or purchases (stifled by pandemic measures). Many households used their unspent funds for home improvements and repairs and to purchase furniture. Significant pressure on the panels market was also caused by the closure of some wood-based panel plants, limiting supply and driving prices up.

Apparent consumption decreased in the EECCA in 2020 for both structural panels (down by 8.6%, to 3.5 million m³) and non-structural panels (down by 6.7%, to 15.4 million m³) (graphs 4.4 and 4.5). The apparent consumption of all wood-based panels fell by 6.7% in the EECCA in 2020, to 19.0 million m³. The production of wood-based panels decreased by 3.4% in EECCA, to 23.4 million m³, and decreased by 1.0% in the Russian Federation, to 17.4 million m³.

GRAPH 4.4

EECCA: Structural panels production, trade and consumption, 2016-2020



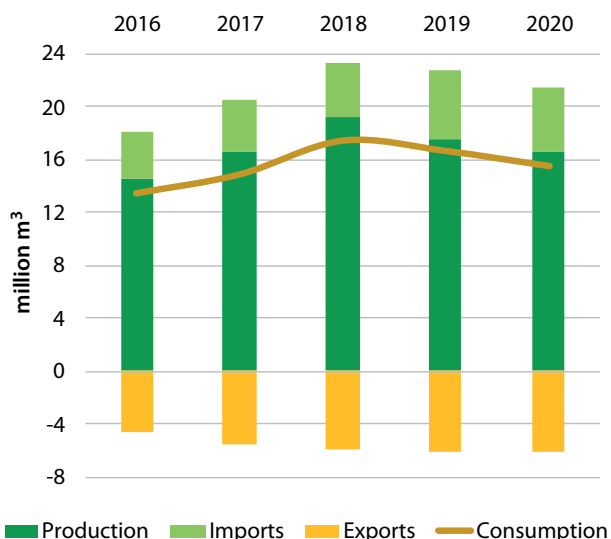
Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

The trade volume of wood-based panels grew in the EECCA for three consecutive years (2016–2018), driven mainly by trade developments in the Russian Federation; this growth plateaued in 2019 but resumed in 2020 (graphs 4.4 and 4.5). Russian imports of structural wood-based panels increased in 2020 (plywood by 60%, to 120,000 m³, and OSB by 43%, to 351,000 m³); imports of non-structural panels also grew (particle board by 25%, to 299,000 m³, and fibreboard by 7%, to

GRAPH 4.5

EECCA: Non-structural panels production, trade and consumption, 2016-2020

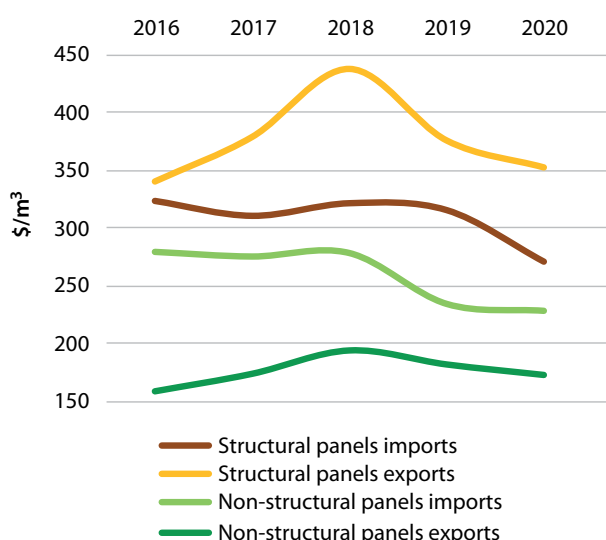


Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

GRAPH 4.6

EECCA: Traded wood-based panels unit value, 2016-2020



Source: FAOSTAT, 2021.

460,000 m³). Russian exports increased for most wood-based panel products: OSB exports grew by 30.0% (to 362,390 m³), fibreboard exports were up by 3.6% (to 1.24 million m³), and plywood exports rose by 5.7% (to 2.90 million m³) (WhatWood, 2021f). In contrast, particle-board exports fell by 12.1%, to 1.74 million m³. The unit value of traded panels decreased for all panel products in 2020, with the exception of non-structural panel imports, for which unit prices were flat (graph 4.6).

There was a particularly sharp surge in prices for wood-based panels in the Russian Federation in the third quarter of 2020. Retail prices for particle board increased by at least 88% between July 2020 and May 2021, MDF prices grew by 83%, laminated MDF prices rose by 55%, HDF prices leapt by 95%, OSB prices soared by 145% and plywood prices were up by 71% (WhatWood, 2021f). The main peak in prices occurred in May-June 2021, after which they were flat or even began to decline.

North America

Although the apparent consumption of wood-based panels declined by 3.3% in North America in 2020, a combination of rapidly rising prices and United States trade actions caused the total value of North American wood-based panel exports to increase by 18.9%. Total wood-based panel production in North America fell by 3.5% in 2020, to 45.5 million m³ (graphs 4.7 and 4.8). Production capacity in the North American structural panel industry increased by 0.3% and the utilization rate decreased from 75.3% in 2019 to 74.5% in 2020 (APA, 2021a).

The consumption of structural wood-based panels increased overall by 1.1% in North America in 2020 (graph 4.7), with demand rising for OSB by 2.6% and falling for plywood by 0.7% (graph 4.8).

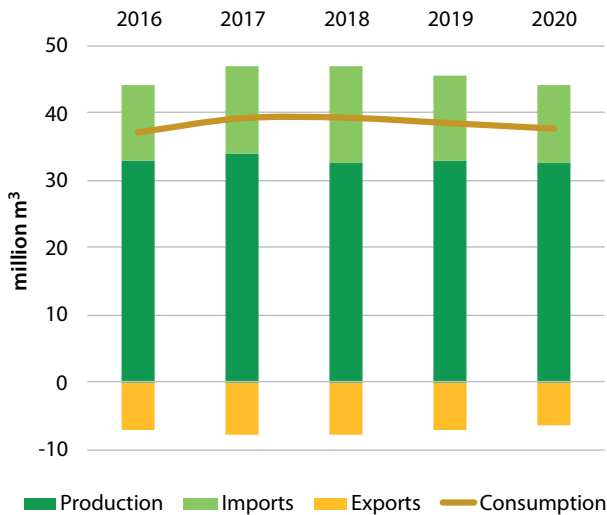
Trends in the consumption of wood-based structural panels were mixed across the four major end-use markets – consumption was up by 5.5% in the residential construction market and by 2.5% in the remodelling market but down by 13.2% in the industrial market and by 1.1% in the non-residential market (APA, 2021b).

North American consumption of non-structural panels (particle board and MDF) fell by 5.9% in 2020, with MDF dropping by 8.9% and particle board down by 5.2%. With North American housing starts projected to rise again as the two countries emerge from pandemic-related lockdowns, the production of non-structural wood-based panels is expected to increase by 11% in 2021 (CPA, 2021a).

The value of North American imports of wood-based panels was up sharply (+13.9%) in 2020, to \$6.6 billion. The value of imports to the United States rose by 16.6%, with the exception

GRAPH 4.7

North America: Structural panels production, trade and consumption, 2016-2020

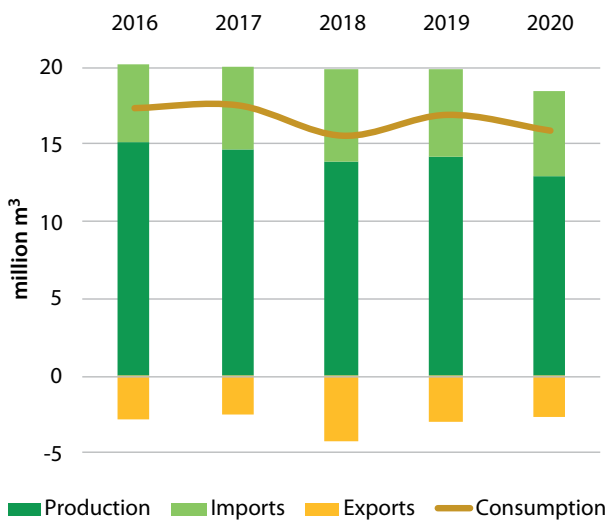


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 4.8

North America: Non-structural panels production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

of particle board, which fell by 12.0%. In Canada, the value of panel imports was flat (0.9%) in 2020; imports rose for particle board (+9.8%) and were steady for OSB (+0.7%).

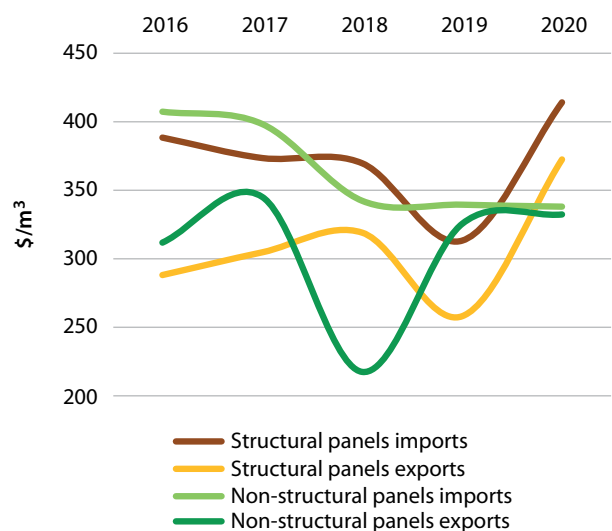
The value of wood-based panel exports from North America jumped by 18.9% in 2020, to \$3.3 billion, with Canada accounting for 81.6% of the total. The value of exports from North America (including trade between Canada and the United States) leapt by 51% for OSB but fell by 3.0% for plywood, by 5.3% for fibreboard and by 11.5% for particle board.

North American production capacity for non-structural panels fell by 3% in 2020, to about 15.6 million m³, with most of the decrease occurring in Canada. The capacity utilization rate decreased in the particle-board subsector from 67% in 2019 to 61% in 2020; it also fell in the MDF subsector, from 78.4% in 2019 to 76.4% in 2020 (CPA, 2021b).

Strong demand for wood-based panels, coupled with COVID-19-related supply constraints, led to unprecedented price increases through 2020 and the first half of 2021. By the middle of 2021, prices had leapt for western plywood (+417%), southern plywood (377%) and OSB (455%); particle board (+21%) and MDF (+23%) registered smaller price hikes (Random Lengths, 2021b). These trends are clearly visible in the price data and declared unit prices of traded structural and non-structural panels (graphs 4.9 and 4.10).

GRAPH 4.9

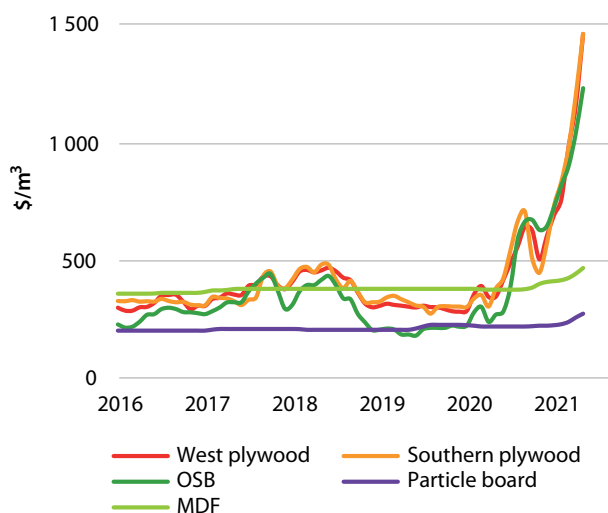
North America: Traded wood-based panels unit value, 2016-2020



Source: UNECE/FAO database, 2021.

GRAPH 4.10

North America: Wood-based panel prices, 2016-2021



Note: m³ per 1,000 square feet: western plywood: 1.180; southern plywood: 1.106; OSB: 1.032; particle board and MDF: 1.475.

Source: Random Lengths, 2021b.

Extraregional influences on the UNECE

Outside the UNECE region, Japan, China and the Republic of Korea are the largest importers of wood-based panels by both volume and value (table 4.1).

China is the world’s largest wood-based panels exporter (by volume and value), followed by Canada (in volume) and Germany (in value). Five countries in the UNECE region are among the top ten exporters globally (table 4.2).

Outside the UNECE region, imports by Japan and the Republic of Korea and exports from Indonesia and Malaysia continue to dominate the global trade of tropical plywood by volume. In 2020, the UNECE region absorbed 35% of total tropical plywood imports, although imports by EU countries declined compared with 2019 and United States imports grew rapidly, with that country accounting for 25% of world imports in 2020, compared with only 11% in 2016.

Japan’s imports of tropical plywood have contracted year-on-year since 2013, and the volume dropped by 29% in 2020 (to 1.2 million m³) due to declining construction activity; dropping overall demand for tropical plywood; re-investment in Japanese plywood processing capacity and technology focused on using domestic species; and the reduced availability of South Sea plywood. Plywood imports from Indonesia and Malaysia, Japan’s major suppliers, were constrained in 2020 by production shortages caused



TABLE 4.1

Top ten extraregional wood-based panel importers, 2020

| | Structural | Non-structural | Total (all panels) | |
|-------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| Japan | 2,122 | 723 | 3,080 | 1,643 |
| China | 1,213 | 1,626 | 3,191 | 1,040 |
| Republic of Korea | 1,787 | 1,273 | 3,173 | 960 |
| Malaysia* | 1,022 | 654 | 1,676 | 362 |
| Mexico* | 609 | 621 | 1,230 | 498 |
| Viet Nam* | 656 | 572 | 1,228 | 531 |
| Egypt | 792 | 507 | 1,299 | 372 |
| Philippines* | 925 | 194 | 1,119 | 507 |
| Saudi Arabia* | 443 | 721 | 1,165 | 435 |
| Australia | 488 | 241 | 754 | 478 |

Note: * 2019 data; UNECE region countries are not included.

Sources: FAOSTAT, 2021; UN Comtrade, 2021.

TABLE 4.2

Top ten wood-based panel exporters globally, 2019

| | Structural | Non-structural | Total (all panels) | |
|--------------------|----------------------|----------------------|----------------------|------------|
| | 1,000 m ³ | 1,000 m ³ | 1,000 m ³ | \$ million |
| China | 9,607 | 2,325 | 12,073 | 5,221 |
| Canada | 5,794 | 1,589 | 7,383 | 2,700 |
| Russian Federation | 3,266 | 3,048 | 6,315 | 1,807 |
| Germany | 874.07 | 5,131 | 6,005 | 2,758 |
| Thailand* | 54 | 5,401 | 5,456 | 972 |
| Brazil | 2,783 | 1,313 | 4,285 | 989 |
| Belarus | 906 | 2,468 | 3,374 | 585 |
| Malaysia* | 1,775 | 1,538 | 3,313 | 1,180 |
| Poland | 645.74 | 2,610 | 3,256 | 1,053 |
| Indonesia* | 2,732 | 519 | 3,251 | 1,813 |

Note: * 2019 data.

Sources: FAOSTAT, 2021; UN Comtrade, 2021; UNECE/FAO database, 2021.

by COVID-19-related safe-work practices, extended lead times, labour shortages, and the rise in global container shipping rates due to disruptions in distribution caused by the pandemic. The market share of domestically produced plywood in Japan increased to 67% of total plywood consumption in 2020 (ITTO, 2021a).

Indonesia's exports declined in volume by 28% in 2020 (to 2.3 million m³), but the country remained the world's largest exporter of tropical plywood, shipping 35% of global exports. Although exports declined to Japan by 19% (by volume) in 2020, they increased to the United States by 10%, benefiting (as Malaysia and Viet Nam have done) from the trend among United States importers to diversify supply sources from China to other Asian suppliers. Malaysia's plywood production and exports continued to be affected by chronic supply shortages of peeler logs to plywood mills, and production levels have not yet returned to pre-pandemic levels.

In contrast to all other major tropical plywood exporters, Viet Nam's exports rose by 32% (to 1.5 million m³) in 2020, reflecting the quick and sustained resumption of production following the first wave of the pandemic, aided by government stimulus, and the resumption of growth in the housing and do-it-yourself sectors in the United States, Viet Nam's major market. China's exports of tropical plywood have declined year-on-year from a peak in 2017, contracting by one-third in 2020 to 0.495 million m³. This is mainly in response to the imposition of countervailing measures and tariffs by the United States on plywood imports from China and a surge in domestic demand as the economy bounced back from the effects of the pandemic in the second half of 2020 (ITTO, 2021a).

UNECE subregional data summary and forecast

Table 4.3 summarizes data on wood-based panels production, consumption, trade and declared value of cross-border trade. Additional information and the complete forest products database is available at www.unece.org/forests/fpamr2021-annex.

Initial data supplied by UNECE member states (all figures are year-on-year) indicate that the production of wood-based panels in the UNECE region will increase by 3.3% in both 2021 and 2022. Subregionally, the forecast is for production to grow in Europe by 2.3% in 2021 and by 2.1% in 2022; expand in the EECCA by 12% in 2021 and by 7.2% in 2022; and increase in North America by 3.0% in 2021 and by 1.3% in 2022.

TABLE 4.3

Wood-based panels production, imports, exports, net apparent consumption and traded unit value, UNECE subregions, 2016-2020

| | 2016 | 2017 | 2018 | 2019 | 2020 | Change 2019-2010 |
|--|--------|--------|--------|--------|--------|------------------|
| EUROPE | | | | | | |
| Structural panels | | | | | | |
| Production (1,000 m ³) | 11,996 | 12,705 | 12,703 | 12,448 | 12,497 | 0.4% |
| Imports (1,000 m ³) | 11,042 | 11,857 | 12,626 | 12,063 | 12,012 | -0.4% |
| Exports (1,000 m ³) | 8,433 | 9,038 | 8,966 | 8,858 | 8,864 | 0.1% |
| Consumption (1,000 m ³) | 14,605 | 15,523 | 16,363 | 15,653 | 15,645 | 0.0% |
| Import unit value (\$/m ³) | 448 | 467 | 500 | 459 | 440 | -4.1% |
| Export unit value (\$/m ³) | 454 | 475 | 540 | 510 | 495 | -2.9% |
| Non-structural panels | | | | | | |
| Production (1,000 m ³) | 60,341 | 61,407 | 61,367 | 61,463 | 59,128 | -3.8% |
| Imports (1,000 m ³) | 21,998 | 23,897 | 24,584 | 24,654 | 23,350 | -5.3% |
| Exports (1,000 m ³) | 25,240 | 26,617 | 26,459 | 26,809 | 26,596 | -0.8% |
| Consumption (1,000 m ³) | 57,099 | 58,687 | 59,491 | 59,308 | 55,883 | -5.8% |
| Import unit value (\$/m ³) | 315 | 309 | 327 | 301 | 310 | 3.1% |
| Export unit value (\$/m ³) | 347 | 351 | 379 | 351 | 352 | 0.1% |
| EECCA | | | | | | |
| Structural panels | | | | | | |
| Production (1,000 m ³) | 5,665 | 6,027 | 6,684 | 6,660 | 6,724 | 1.0% |
| Imports (1,000 m ³) | 1,060 | 1,188 | 1,150 | 983 | 1,139 | 8.3% |
| Exports (1,000 m ³) | 3,481 | 3,696 | 3,947 | 3,842 | 4,316 | 12.3% |
| Consumption (1,000 m ³) | 3,243 | 3,519 | 3,888 | 3,801 | 3,473 | -8.6% |
| Import unit value (\$/m ³) | 324 | 311 | 322 | 316 | 271 | -14.2% |
| Export unit value (\$/m ³) | 341 | 379 | 437 | 376 | 353 | -6.2% |
| Non-structural panels | | | | | | |
| Production (1,000 m ³) | 14,445 | 16,556 | 19,226 | 17,513 | 16,640 | -5.0% |
| Imports (1,000 m ³) | 3,690 | 3,846 | 3,954 | 5,187 | 4,844 | 1.0% |
| Exports (1,000 m ³) | 4,690 | 5,569 | 5,864 | 6,146 | 6,040 | -1.7% |
| Consumption (1,000 m ³) | 13,444 | 14,832 | 17,316 | 16,554 | 15,444 | -4.7% |
| Import unit value (\$/m ³) | 280 | 276 | 279 | 235 | 229 | -2.6% |
| Export unit value (\$/m ³) | 158 | 173 | 193 | 181 | 172 | -4.7% |
| NORTH AMERICA | | | | | | |
| Structural panels | | | | | | |
| Production (1,000 m ³) | 32,767 | 33,936 | 32,665 | 32,913 | 32,594 | -1.0% |
| Imports (1,000 m ³) | 11,303 | 12,930 | 14,471 | 12,587 | 11,493 | -8.7% |
| Exports (1,000 m ³) | 7,072 | 7,708 | 7,898 | 7,098 | 6,517 | -8.2% |
| Consumption (1,000 m ³) | 36,999 | 39,158 | 39,238 | 38,402 | 37,570 | -2.2% |
| Import unit value (\$/m ³) | 388 | 373 | 369 | 314 | 413 | 31.7% |
| Export unit value (\$/m ³) | 288 | 305 | 319 | 258 | 373 | 44.6% |
| Non-structural panels | | | | | | |
| Production (1,000 m ³) | 15,203 | 14,645 | 13,876 | 14,235 | 12,900 | -9.4% |
| Imports (1,000 m ³) | 4,890 | 5,351 | 5,908 | 5,536 | 5,592 | 1.0% |
| Exports (1,000 m ³) | 2,821 | 2,551 | 4,251 | 2,925 | 2,641 | -9.7% |
| Consumption (1,000 m ³) | 17,272 | 17,445 | 15,533 | 16,847 | 15,851 | -5.9% |
| Import unit value (\$/m ³) | 408 | 399 | 342 | 339 | 337 | -0.4% |
| Export unit value (\$/m ³) | 312 | 344 | 218 | 325 | 332 | 2.1% |

Note: Structural panels consist of plywood and OSB and non-structural panels consist of particle board and fibreboard. Unit values are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by their volume.

Sources: FAOSTAT, 2021; UNECE/FAO database, 2021.





Chapter 5

PULP AND
PAPER

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Introduction and UNECE region overview

The global pulp, paper and paperboard industry experienced general weakness in 2020 due to fallout from the COVID-19 pandemic.

The production of graphic paper declined due to papermill closures and reduced consumption, the result of increased electronic communication. In contrast, growth continued in the consumption of sanitary and household papers, certain paperboard products and specialty papers, and pulps, including fluff and dissolving pulp.

Prices for printing and writing papers and newsprint remained weak in the EECCA in 2020 due to low demand. Prices were relatively stable in the subregion for paperboard and tissue but increased marginally for market pulp due to closures and very low levels of incremental capacity. A significant rebound in market-pulp prices began in early 2021, aided by stronger demand from China.

The production of graphic papers declined by 16.3% in Europe in 2020 and by 24.0% in North America but rose by 4.0% in the EECCA. Apparent consumption also fell in Europe (by 2.7%) and North America (by 25.6%) but increased in the EECCA (by 14.8%), in part due to capacity closures in Europe.

The production of packaging materials rose throughout the UNECE region in 2020 – it increased in Europe by 1.2%, in the EECCA by 4.1% and in North America by 0.6%. The apparent consumption of packaging material fell in Europe by 0.7% and in the EECCA by 5.4%, but it increased in North America by 0.3%.

Export and import unit values fell for all graphic grades throughout the UNECE region in 2020.

Prices for market pulp, graphic and specialty papers and packaging materials rose on stronger demand in 2021 as economies began to open up following the downturn in global activity caused by the pandemic. Challenges in the re-opening of global economies will likely persist well into 2021, however, such as those associated with returning to places of work.

The COVID-19 measures had a significant impact on the flow of recovered paper and paperboard throughout the UNECE region in 2020. China implemented a complete ban on imports of recovered paper from any country across all grades. As a result, it imported 2.5 million tonnes of recycled pulp (replacing production from recovered paper) in 2020, three times as much as in 2019.

Europe

Total woodpulp production fell by 3.5% in Europe in 2020 (graph 5.1) due to weaker graphic-paper demand caused mainly by the COVID-19 pandemic. The strongest decline was in Finland, where production fell by 9.3%, to 10.5 million tonnes, due to mill closures, labour disputes and overall reduced demand. Finland was also the main driver behind the subregion's reduced consumption of woodpulp; its consumption fell by 15.7% in 2020, to 6.4 million tonnes.

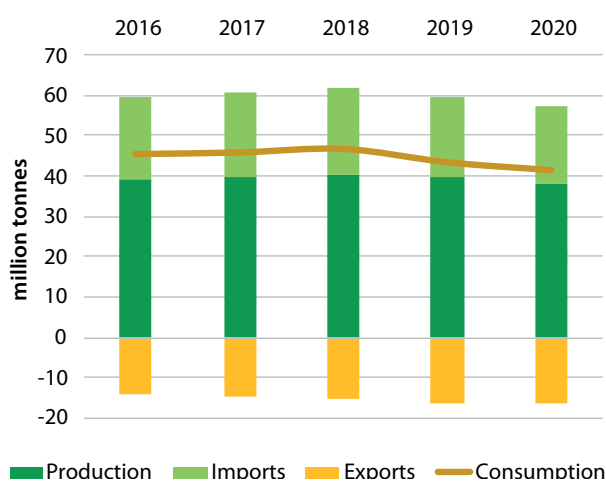
Europe's apparent consumption of chemical woodpulp fell by 2.8% in 2020, to 31.1 million tonnes. The apparent consumption of chemical market pulp fell by 5.0%, to 15.9 million tonnes (CEPI, 2021).

Falling demand for printing and writing paper, and larger margins on chemical and mechanical pulp, enabled integrated mills to fill machine time by running pulp for the market. As demand for market pulp waned through 2020, however, the additional volumes from integrated players added to overcapacity; consequently, pricing weakness persisted to the end of the year.

Europe's production of paper and paperboard was down by 4.7% in 2020, at 91.8 million tonnes (graph 5.2). The drop was due mainly to Finland, where production fell by 15.5%, to 8.2 million tonnes. Graphic-paper production fell by 16.3% in the subregion due to reduced consumption in the United Kingdom and Germany (down by 25.8% and 13.8%,

GRAPH 5.1

Europe: Woodpulp production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

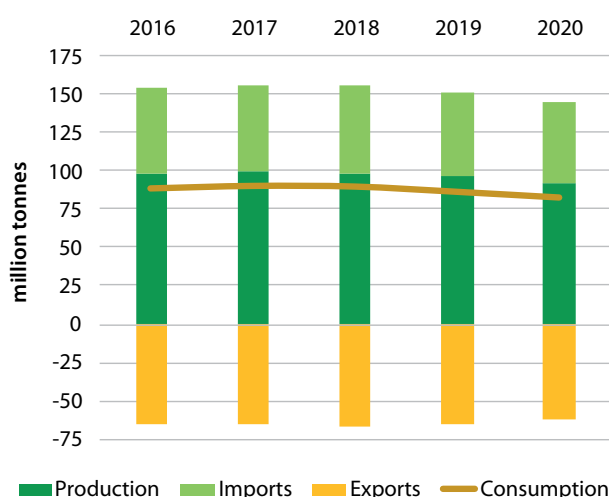
Source: UNECE/FAO database, 2021.

respectively), resulting in several machine closures. Production fell by 19.9% for newsprint, to 4.2 million tonnes; by 13.4% for uncoated mechanical papers, to 4.7 million tonnes; by 11.0% for uncoated wood-free papers, to 7.3 million tonnes; and by 19.6% for coated papers, to 9.8 million tonnes.

The subregion's apparent consumption of paper declined by 4.1% in 2020, to 82.7 million tonnes, with the trend driven mainly by reduced consumption in the United Kingdom (down by 10.4%), France (-9.2%) and Germany (3.3%), the three countries experiencing a combined drop in apparent consumption of 2.2 million tonnes. Europe's paper consumption declined by 22.5% for newsprint, to 3.9 million tonnes; by 7.0% for uncoated mechanical papers, to 3.9 million tonnes; by 9.0% for uncoated wood-free papers, to 6.8 million tonnes; and by 13.0% for coated papers, to 7.7 million tonnes.

GRAPH 5.2

Europe: Paper production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

Europe's apparent consumption increased in 2020 by 1.0% for sanitary and household papers (on a rise in production of 0.4%) but fell by 0.7% for paperboard (packaging subsegment), by 4.1% for paper and paperboard, by 2.7% for graphic papers and by 0.7% for packaging material.

Europe's production of chemical market pulp fell by 1.3% in 2020, to 4.1 million tonnes, and the consumption of this product dropped by 5.0%, to 15.9 million tonnes (CEPI, 2021).

Woodpulp exports declined by 0.4% in 2020 and imports fell by 3.2%. Germany was the main driver behind the drop, with its imports falling by 15.2% (to 4.0 million tonnes). Europe's exports were flat, but the gap closed between the two main

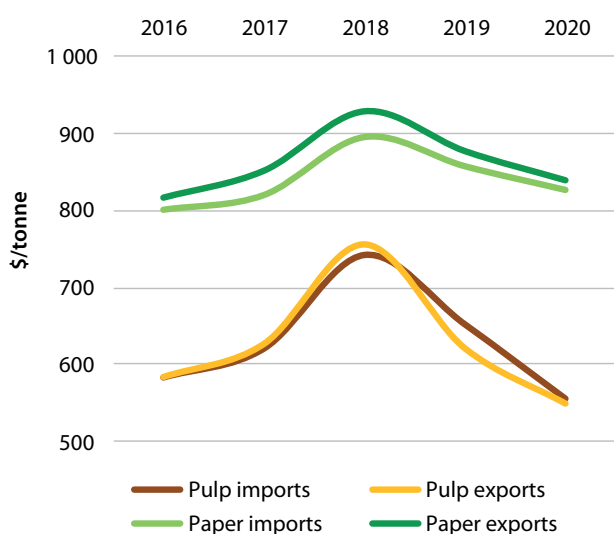
exporters, with exports increasing for Sweden by 2.1% (to 4.3 million tonnes) and declining for Finland by 4.1% (to 4.3 million tonnes). Exports of graphic paper fell by 16.0% in Europe in 2020, and imports were down by 11.7%.

There was considerable volatility in the volume and type of paper recycling in Europe in 2020, with an overall drop in volume of 3.0%, to 58.6 million tonnes. Many schools and businesses were closed and office buildings were mostly deserted; thus, paper recycling fell in the institutional and commercial segments in 2020 and well into 2021 but increased in residential areas as people were encouraged or forced to stay home. Increased online shopping caused a spike in demand of old corrugated containers (Lombard, 2021).

Unit values were lower for virtually every traded woodpulp and paper type in Europe in 2020 (as they were in 2019, too), the result of lower demand (graph 5.3). There was an 11.5% decline in the unit value of woodpulp exports, and the import unit value dropped by 15.0%. Graphic-paper unit values fell by 4.5% for exports and by 4.2% for imports.

GRAPH 5.3

Europe: Traded woodpulp and paper unit value, 2016-2020



Source: UNECE/FAO database, 2021.

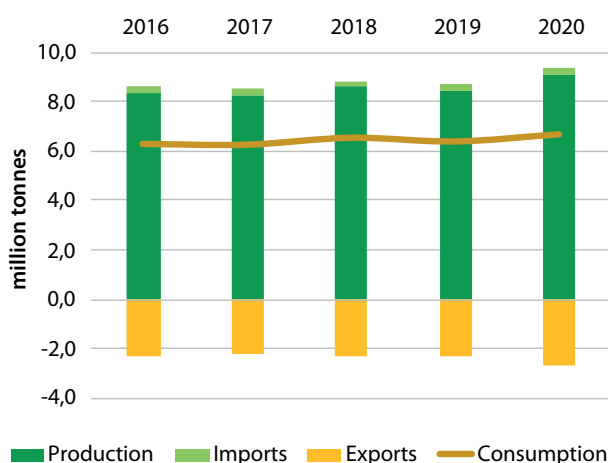
Eastern Europe, Caucasus and Central Asia

Chemical woodpulp production rose by 9.9% in the EECCA in 2020, to 6.6 million tonnes, due mainly to capacity expansion in Belarus (graph 5.4). There was a corresponding increase in apparent consumption in the EECCA of 6.1%, to 4.4 million tonnes.



GRAPH 5.4

EECCA: Woodpulp production, trade and consumption, 2016-2020

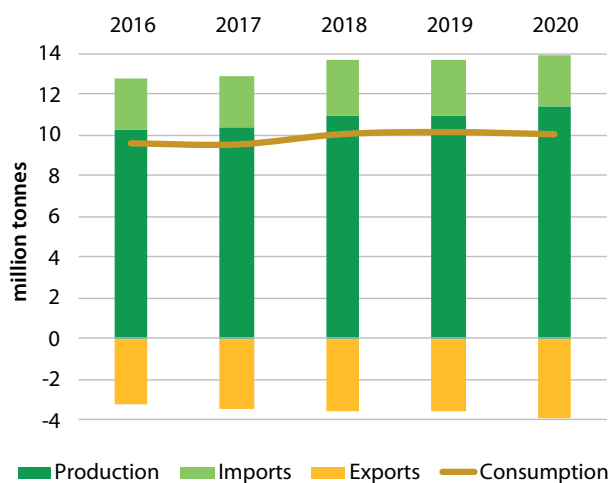


Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

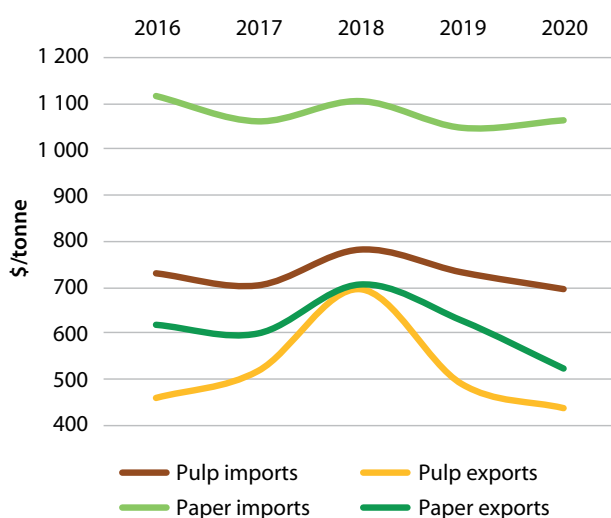
Paper and paperboard production rose by 4.2% in the EECCA in 2020, to 11.4 million tonnes (graph 5.5). The pulp industry grew in parts of the subregion – such as Belarus and the Russian Federation – with new capacity. The Russian Federation was by far the EECCA's biggest producer of paper and paperboard in 2020, at 9.5 million tonnes, up by 4.4% compared with 2019.

The production of packaging materials rose by 4.1% in the EECCA in 2020, with case materials increasing by 4.1%, cartonboard up by 5.4% and wrapping papers higher by 1.6%. Newsprint production fell by 13.2% and exports dropped by 15.3%; the domestic consumption of this product was down by 7.1%, to 348,000 tonnes. The production of coated papers rose by 29.5% but consumption fell by 10.7%. The production of uncoated wood-free papers leapt by 30.8% and consumption was also significantly higher (+40.1%). The apparent consumption of sanitary and household papers grew by 4.2%.

GRAPH 5.5
EECCA: Paper production, trade and consumption, 2016-2020


Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

GRAPH 5.6
EECCA: Traded woodpulp and paper unit value, 2016-2020


Source: FAOSTAT, 2021.

Unit values for exported woodpulp and paper declined significantly in the EECCA in 2020 – by 10.8% and 16.9%, respectively (graph 5.6). Unit values dropped by 5.1% for woodpulp imports but rose slightly (by 1.6%) for paper imports.

In the Russian Federation, chemical market-pulp production grew by 8.4% in 2020, to 3.0 million tonnes (RAO Bumprom, 2021), aided by capacity expansions. Exports grew by 12.4% on stronger demand from China.

North America

Woodpulp production dropped by 3.7% in North America in 2020, to 66.3 million tonnes (graph 5.7). Chemical pulp production was down by 1.1% (to 53.7 million tonnes), but its apparent consumption rose by 0.4% (to 46.0 million tonnes).

The production of paper and paperboard dropped by 3.5% in the subregion in 2020, to 74.9 million tonnes. The apparent consumption of paper and paperboard continued its downward trend, declining by 4.1%, to 68.6 million tonnes (graph 5.8).

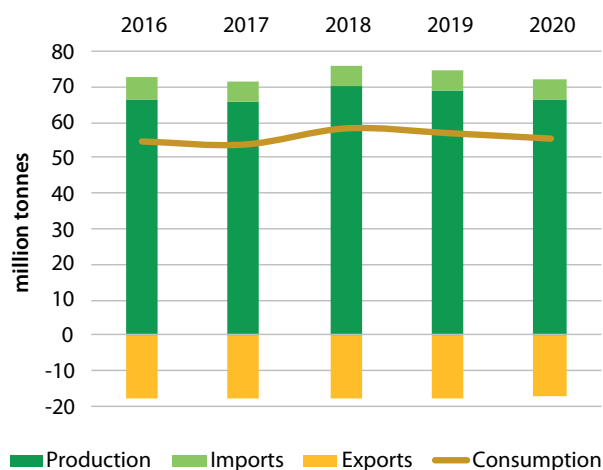
The production of graphic papers fell by 24.0% in North America in 2020 (to 12.8 million tonnes); it has fallen by 42.2% since 2016, leading to significant – and mostly permanent – capacity reductions. The drop in demand has been fuelled largely by a move by end-users towards electronic communication, including the internet, but it was accentuated by the pandemic in 2020. Imports of graphic papers fell by 22.2%, and exports were down by 17.8%.

Production increased by 0.6% in the subregion in 2020 for packaging materials, to 51.8 million tonnes, but fell by 25.7% for newsprint, to 2.5 million tonnes. Low prices and poor profitability resulted in significant capacity rationalization. Production dropped by 21.2% for uncoated mechanical paper, to 1.8 million tonnes; by 21.5% for uncoated wood-free paper, to 5.3 million tonnes; and by 27.9% for coated papers, to 3.3 million tonnes. The production of sanitary and household papers rose by 3.1%, to 8.0 million tonnes.



GRAPH 5.7

North America: Woodpulp production, trade and consumption, 2016-2020

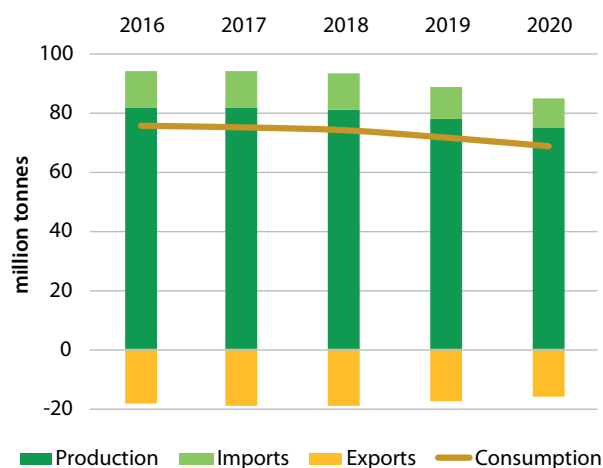


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 5.8

North America: Paper production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

North America's apparent consumption of graphic paper dropped by 25.6% in 2020 (more than double the decline in 2019), to 12.5 million tonnes. The apparent consumption of newsprint fell by 25.8%, to 1.6 million tonnes. Apparent consumption also declined for uncoated mechanical paper, by 23.0% (to 1.8 million tonnes); for uncoated wood-free paper, by 22.5% (to 5.5 million tonnes); and for coated papers, by 30.8% (to 3.7 million tonnes). With many parts of the subregion subject to travel restrictions, an increase in electronic communication led to a faster drop in paper consumption than in previous years.

For sanitary and household papers, apparent consumption was up by 4.1% in 2020 (to 8.3 million tonnes), and production rose by 3.1% (to 8.0 million tonnes).

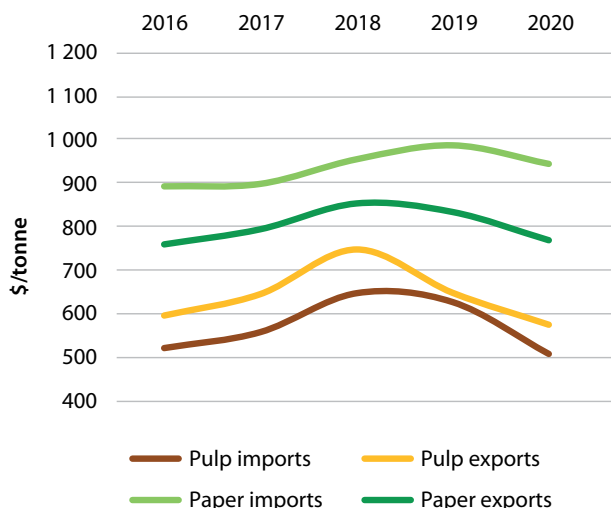
Apparent consumption grew by 0.3% for packaging materials, to 45.8 million tonnes; by 2.2% for cartonboard, to 6.4 million tonnes; and by 2.6% for case materials, to 32.2 million tonnes. It fell by 34.4% for wrapping papers (to 1.5 million tonnes) due to retail and restaurant/hospitality closures in much of the subregion.

China completely banned the importation of recovered papers from any country across all grades effective from January 2021, including newsprint, pulp substitutes, old corrugated containers and mixed papers (People's Republic of China Ministry of Ecology and Environment, 2020). In 2018, 45.6% of Chinese recovered-paper imports came from the United States, but the volume had been dropping since 2013. China's recovered-paper imports from the United States nearly halved from a high of 30.1 million tonnes in 2012 to 17.0 million tonnes in 2018 and had fallen to 10.6 million tonnes by 2019 as the Government of China restricted certain shipments based on contaminant levels. As a result, much of what was collected in the United States waste stream had no market, and reports began to surface of the burning or landfilling of waste paper and a cessation of collection. The COVID-19 pandemic reduced both demand and supply in 2020, and prices fell and volumes collapsed. The United States exported 14.4 million tonnes of recovered paper in 2020, down by 12.7% compared with 2019; data for the first four months of 2021, on the other hand, show a surge in United States exports of recovered paper to Indonesia (+505%), India (+356%), Mexico (+131%) and Viet Nam (+106%), while exports to China fell by 87% (US Census Bureau, 2021c).

The declared unit values of traded woodpulp and papers were both lower across all grades in North America in 2020, the result of lower apparent consumption (graph 5.9 and table 5.3). Declared unit values declined for woodpulp by 11.2% for exports and 18.8% for imports and for paper by 7.6% for exports and 7.2% for imports.

GRAPH 5.9

North America: Traded woodpulp and paper unit value, 2016-2020



Source: UNECE/FAO database, 2021.

Extraregional influences on the UNECE

■ CHINA

Paper production and consumption increased in China in 2020, despite early lockdowns in parts of the country as an anti-COVID-19 measure and a continued drop in recovered-paper imports (China Paper Association, 2021). Overall, paper production reached 112.6 million tonnes in 2020, up by 4.6% compared with 2019, and consumption was 118.3 million tonnes, up by 10.5%.

Chinese production declined by 26.7% in 2020 for newsprint (to 1.1 million tonnes) and by 5.9% for coated printing and writing paper (to 6.4 million tonnes). Consumption also dropped for newsprint, by 10.3% (to 1.75 million tonnes), but increased by 5.4% for coated printing and writing paper (to 5.6 million tonnes).

Chinese production of uncoated printing and writing paper declined by 2.8% in 2020, to 17.3 million tonnes.

An increase in the consumption of coated and uncoated printing and writing paper in 2020 can be attributed in part to a strong publishing sector, with the Chinese Communist Party celebrating its one-hundredth anniversary in 2021. The increased consumption of these grades was facilitated by stronger imports to compensate for lower domestic production arising from plant closures, as well as by a

reduction in exports driven by the pandemic (China Customs Bureau, 2021; China Paper Association, 2021).

China’s production and consumption of boxboard also grew in 2020 – by 5.7% (to 14.7 million tonnes) and 7.5% (to 13.7 million tonnes), respectively. This was aided by a surge in demand: with many countries opting for lockdowns to minimize the spread of COVID-19, work-from-home measures and business retail closures drove online shopping and package-delivery services.

China’s containerboard sector posted strong growth in 2020. Mills in China produced 24.4 million tonnes of linerboard and 23.9 million tonnes of fluting, up by 11.4% and 7.7%, respectively, compared with 2019; consumption grew even more strongly, with linerboard up by 18.1% and fluting rising by 16.9%.

China imported only 6.9 million tonnes of recovered paper in 2020, a drop of 33.5% (3.5 million tonnes) compared with 2019, due to strict import quotas and in anticipation of a total ban starting in 2021. China imported 2.5 million tonnes of recycled pulp (replacing production from recovered paper) in 2020, three times as much as in 2019 (China Paper Association, 2021). China’s market-pulp imports reached a record high of 29.6 million tonnes in 2020. The country also imported 13.8 million tonnes of paper and paperboard in 2020 (table 5.1), a surge of 84.6% over 2019.

Market-pulp prices first started creeping higher in China in the third quarter of 2020, providing a catalyst for even stronger pricing in 2021 as other world economies began recovering from the pandemic. Also adding to higher prices were shipping and logistical issues, including lower producer stocks and a shortage of containers.



TABLE 5.1

Top ten extraregional woodpulp and paper importers, 2020

| | Woodpulp imports | Paper imports | Total woodpulp and paper imports | |
|-------------------|------------------|---------------|----------------------------------|------------|
| | 1,000 tonnes | 1,000 tonnes | 1,000 tonnes | \$ million |
| China | 29,609 | 13,805 | 43,414 | 23,321 |
| India | 1,387 | 2,102 | 3,489 | 2,237 |
| Republic of Korea | 2,122 | 1,110 | 3,231 | 2,334 |
| Japan | 1,514 | 1,226 | 2,741 | 2,344 |
| Mexico | 388 | 2,087 | 2,474 | 3,095 |
| Singapore* | 834 | 1,388 | 2,222 | 1,356 |
| Indonesia* | 1,444 | 772 | 2,216 | 1,991 |
| Malaysia* | 457 | 1,670 | 2,127 | 1,783 |
| Viet Nam* | 403 | 1,597 | 2,000 | 1,711 |
| Egypt* | 493 | 1,236 | 1,729 | 1,462 |

Note: * 2019 data; UNECE region countries not included.

Source: FAOSTAT, 2021; UN Comtrade, 2021.

■ BRAZIL

Brazil produced 21.0 million tonnes of woodpulp (integrated and market) in 2020, an increase of 6.4% compared with 2019, and 10.1 million tonnes of paper and paperboard, a drop of 3.3%. The stronger pulp production was due mainly to a recovery of demand in global markets, with prices rising from cyclical lows.

Brazil exported 16.2 million tonnes of pulp in 2020 (table 5.2). Its pulp imports fell by 26.9%, due mainly to a sharp devaluation of the currency against the US dollar driven by the economic impact of the pandemic (Ibá, 2021).

■ CHILE

Chile's exports of pulp, paper and paperboard fell by 6.6% in 2020, due mainly to increased competition from Brazilian pulp exports, mainly in Asian markets. The country's aggregate pulp exports fell by 8.3%, with bleached radiata-pine pulp down by 13.7% and unbleached radiata-pine pulp lower by 5.7%. Bleached eucalyptus kraft pulp exports fell by 4.3%.

Chile's folding-boxboard exports rose by 17.1% in 2020 on stronger global demand (Infor, 2021).

TABLE 5.2

Top ten woodpulp and paper exporters worldwide, 2020

| | Woodpulp exports | Paper exports | Total woodpulp and paper exports | |
|--------------------|------------------|---------------|----------------------------------|------------|
| | 1,000 tonnes | 1,000 tonnes | 1,000 tonnes | \$ million |
| United States | 7,806 | 10,314 | 18,120 | 13,195 |
| Brazil | 16,153 | 1,921 | 18,074 | 7,477 |
| Canada | 9,018 | 5,961 | 14,979 | 9,071 |
| Germany | 1,146 | 13,632 | 14,778 | 12,576 |
| Sweden | 4,331 | 9,081 | 13,412 | 9,852 |
| Finland | 4,333 | 7,832 | 12,165 | 8,507 |
| Indonesia* | 5,385 | 4,853 | 10,238 | 7,015 |
| China | 150 | 6,223 | 6,373 | 6,786 |
| Russian Federation | 2,444 | 3,601 | 6,046 | 2,900 |
| Chile* | 4,719 | 542 | 5,261 | 3,247 |

Note: * 2019 data.

Sources: UNECE/FAO database, 2021; FAOSTAT, 2021.

UNECE subregional data summary and forecast

Table 5.3 summarizes data on woodpulp and paper production, consumption, trade and declared value of cross-border trade by UNECE subregion for the period 2016–2020. Additional information and the complete forest products database is available at www.unece.org/forests/fpamr2021-annex.

Initial data supplied by UNECE member States (all amounts are year-on-year) indicate that the production of paper and paperboard will increase by 3.2% in the UNECE region in 2021 and 1.3% in 2022. Subregionally, the forecast is that paper and paperboard production will increase in all three subregions. In Europe by 2.5% in 2021 and by 0.3% in 2022; in the EECCA by 7.0% in 2021 and by 5.0% in 2022; and in North America by 3.4% in 2021 and 1.8% in 2022.

Woodpulp production is forecast to increase by 1.0% in 2021 and decline by 0.3% in 2022. Woodpulp production is forecasted to grow in Europe by 2.5% in 2021 and remain stable in 2022 (0.1%). Woodpulp is forecasted to increase in the EECCA by 1.0% (2021) and 2.0% (2022) while in North America it is forecasted to increase by 0.2% (2021) and decline by 0.7% (2022).

TABLE 5.3

Woodpulp and paper production, imports, exports, apparent consumption and unit values, UNECE subregions, 2016-2020

| | 2016 | 2017 | 2018 | 2019 | 2020 | Change 2019-2020 |
|------------------------------|--------|--------|--------|--------|--------|------------------|
| EUROPE | | | | | | |
| Woodpulp | | | | | | |
| Production (1,000 tonnes) | 38,963 | 39,722 | 40,345 | 39,558 | 38,159 | -3.5% |
| Imports (1,000 tonnes) | 20,728 | 20,862 | 21,506 | 20,020 | 19,373 | -3.2% |
| Exports (1,000 tonnes) | 14,305 | 14,811 | 15,192 | 16,260 | 16,187 | -0.4% |
| Consumption (1,000 tonnes) | 45,386 | 45,773 | 46,659 | 43,319 | 41,344 | -4.6% |
| Import unit value (\$/tonne) | 582 | 620 | 743 | 652 | 554 | -15.0% |
| Export unit value (\$/tonne) | 583 | 626 | 755 | 620 | 549 | -11.5% |
| Paper | | | | | | |
| Production (1,000 tonnes) | 97,688 | 99,058 | 98,741 | 96,246 | 91,752 | -4.7% |
| Imports (1,000 tonnes) | 56,270 | 57,082 | 57,241 | 55,144 | 52,624 | -4.6% |
| Exports (1,000 tonnes) | 65,550 | 66,181 | 66,427 | 65,094 | 61,635 | -5.3% |
| Consumption (1,000 tonnes) | 88,407 | 89,959 | 89,555 | 86,296 | 82,741 | -4.1% |
| Import unit value (\$/tonne) | 801 | 820 | 896 | 858 | 827 | -3.6% |
| Export unit value (\$/tonne) | 816 | 851 | 929 | 877 | 839 | -4.3% |
| EECCA | | | | | | |
| Woodpulp | | | | | | |
| Production (1,000 tonnes) | 8,368 | 8,301 | 8,613 | 8,421 | 9,063 | 7.6% |
| Imports (1,000 tonnes) | 248 | 241 | 240 | 305 | 322 | 5.4% |
| Exports (1,000 tonnes) | 2,300 | 2,259 | 2,276 | 2,305 | 2,660 | 15.4% |
| Consumption (1,000 tonnes) | 6,316 | 6,284 | 6,577 | 6,421 | 6,725 | 4.7% |
| Import unit value (\$/tonne) | 731 | 704 | 783 | 733 | 696 | -5.1% |
| Export unit value (\$/tonne) | 458 | 516 | 695 | 488 | 435 | -10.8% |
| Paper | | | | | | |
| Production (1,000 tonnes) | 10,219 | 10,333 | 10,948 | 10,942 | 11,404 | 4.2% |
| Imports (1,000 tonnes) | 2,544 | 2,583 | 2,681 | 2,726 | 2,550 | -6.5% |
| Exports (1,000 tonnes) | 3,201 | 3,410 | 3,622 | 3,565 | 3,956 | 11.0% |
| Consumption (1,000 tonnes) | 9,561 | 9,507 | 10,007 | 10,103 | 9,998 | -1.0% |
| Import unit value (\$/tonne) | 1,117 | 1,059 | 1,106 | 1,045 | 1,062 | 1.6% |
| Export unit value (\$/tonne) | 618 | 599 | 707 | 628 | 522 | -16.9% |
| NORTH AMERICA | | | | | | |
| Woodpulp | | | | | | |
| Production (1,000 tonnes) | 66,571 | 66,085 | 70,023 | 68,877 | 66,294 | -3.7% |
| Imports (1,000 tonnes) | 5,902 | 5,720 | 5,916 | 5,700 | 6,079 | 6.7% |
| Exports (1,000 tonnes) | 17,702 | 17,887 | 17,584 | 17,526 | 16,825 | -4.0% |
| Consumption (1,000 tonnes) | 54,771 | 53,918 | 58,356 | 57,051 | 55,549 | -2.6% |
| Import unit value (\$/tonne) | 522 | 558 | 647 | 627 | 509 | -18.8% |
| Export unit value (\$/tonne) | 599 | 648 | 750 | 651 | 578 | -11.2% |
| Paper | | | | | | |
| Production (1,000 tonnes) | 81,813 | 82,003 | 81,033 | 77,630 | 74,906 | -3.5% |
| Imports (1,000 tonnes) | 12,123 | 11,852 | 12,086 | 11,158 | 9,955 | -10.8% |
| Exports (1,000 tonnes) | 18,335 | 18,817 | 19,064 | 17,267 | 16,274 | -5.8% |
| Consumption (1,000 tonnes) | 75,602 | 75,037 | 74,055 | 71,520 | 68,587 | -4.1% |
| Import unit value (\$/tonne) | 893 | 899 | 955 | 988 | 945 | -4.3% |
| Export unit value (\$/tonne) | 762 | 795 | 852 | 833 | 771 | -7.4% |

Note: Unit values are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by the volume of these products.

Sources: UNECE/FAO database, 2021; FAOSTAT, 2021.





Chapter 6

WOOD ENERGY

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Introduction and UNECE region overview

Wood energy plays a significant role in the renewable-energy portfolios of nations across the UNECE region. According to official reports, wood fuel production and consumption decreased slightly (by about 13.9 million m³) in the region in 2020, to 246 million m³.

Much of the recent new demand for wood energy in the UNECE region has been triggered by commercial electricity production; future growth might focus on industrial and residential heating and combined heat and power.

The consumption of wood pellets is increasing steadily, both for industrial applications (electricity and heat production) and in the residential heating sector. The UNECE region accounts for 80% of world production and 90% of global exports.

A total of 35.6 million tonnes of wood pellets was produced in the UNECE region in 2020, an increase of 4.8% over 2019. Among the subregions, Europe was the largest consumer and leading exporter in 2020. Wood pellet production in the Russian Federation grew by 6.5%, year-on-year.

Worldwide production of ENplus-certified pellets exceeded 12 million tonnes in 2020 and is expected to surpass 14 million tonnes in 2021. Germany led global production of certified wood pellets, producing more than 3 million tonnes in 2020.

Policies promoting renewable energy and economic recovery in the wake of the COVID-19 pandemic could spur additional growth in wood-energy demand and production. The evolution of public policy, including sustainable supply and the efficient conversion of biomass into renewable energy, continues to shape wood-energy systems, as illustrated by recent government actions in the Netherlands, Sweden and the United States.

Outside the UNECE region, Viet Nam has become the world's third-largest producer (behind the United States and Canada) of wood pellets and second second-largest exporter (behind the United States). It produced nearly 3.1 million tonnes of wood pellets in 2020, all of which was exported.

The Republic of Korea (3 million tonnes) and Japan (2 million tonnes) were the world's third- and fourth-largest wood-pellet importers, respectively, in 2020.

Europe

The most recent available data show that 23% of the EU27's roundwood production was used for energy generation in 2019 – a large increase from the 17% reported in 2000. In Cyprus, Italy and the Netherlands, close to 60% of roundwood production was destined for energy purposes in 2019. The share of roundwood used for energy increased by 58% in the Netherlands between 2000 and 2019 and by 52% in Cyprus (Eurostat, 2020). European wood fuel⁸ consumption decreased slightly (by 1.5%) in 2020 (graph 6.1).

The deployment of renewables in Europe was slower in the heating-and-cooling sector than in the electricity sector between 2004 and 2018. Over that period, the annual average increase in deployed capacity was 0.66 percentage points in the heating-and-cooling sector compared with 1.27 percentage points in the electricity sector (Bioenergy Europe, 2020). An annual increase of 1.3 percentage points for renewables in final heat consumption has been set as an indicative target in the revised EU Renewable Energy Directive (RED II). How much this target promotes the greater use of renewable wood fuel depends partly on how much heat is generated from waste – which has an upper cap of 40% in RED II (Bioenergy Europe, 2020).

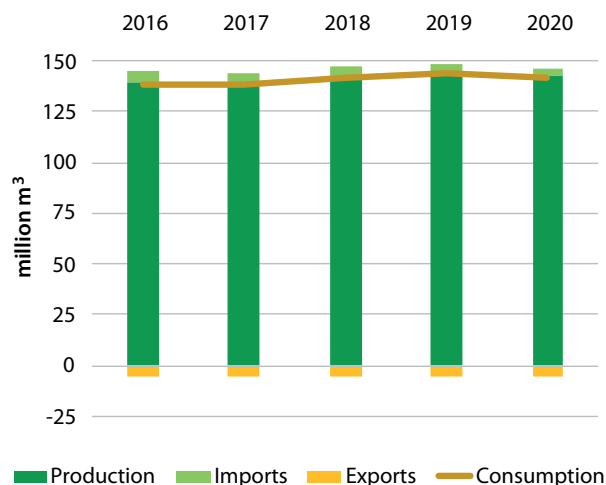
Europe produced about 22.5 million tonnes of wood pellets in 2020, with imports decreasing slightly (by 0.3%) compared with 2019, to 21.7 million tonnes (graph 6.2). Europe has a large number of ENplus-certified companies.⁹ Germany was the world's biggest producer of ENplus-certified pellets in 2020, at more than 3 million tonnes, and Austria and Poland were the second- and third-largest producers in Europe (ENplus, 2021). Worldwide production of ENplus-certified pellets exceeded 12 million tonnes in 2020 and is expected to surpass 14 million tonnes in 2021.

8 Wood fuel is defined in the Joint Eurostat/FAO/ITTO/UNECE Forest Sector Questionnaire as, "roundwood that will be used as fuel for purposes such as cooking, heating or power production. It includes wood harvested from main stems, branches and other parts of trees (where these are harvested for fuel), round or split, and wood that will be used for the production of charcoal, wood pellets and other agglomerates. It also includes wood chips to be used for fuel that are made directly (i.e. in the forest) from roundwood. It excludes wood charcoal, pellets and other agglomerates. It is reported in cubic metres solid volume underbark (i.e. excluding bark)". This definition corresponds with code 313 of the Central Product Classification Version 2.1 of the United Nations Statistics Division and the sum of codes 4401.11 and 4401.12 of the Harmonized System of the World Customs Organization.

9 ENplus certification, established in 2011, comprises quality classes and requirements to complement those set by the European (EN 14961-2) and international (ISO 17225-2) standards (ENplus, 2021). Certification assures compliance with technical specifications, including length and diameter, mechanical durability, percentage of fines, bulk density, ash and moisture content, calorific values, and the percentage of additives.

GRAPH 6.1

Europe: Wood fuel production, trade and consumption, 2016-2020

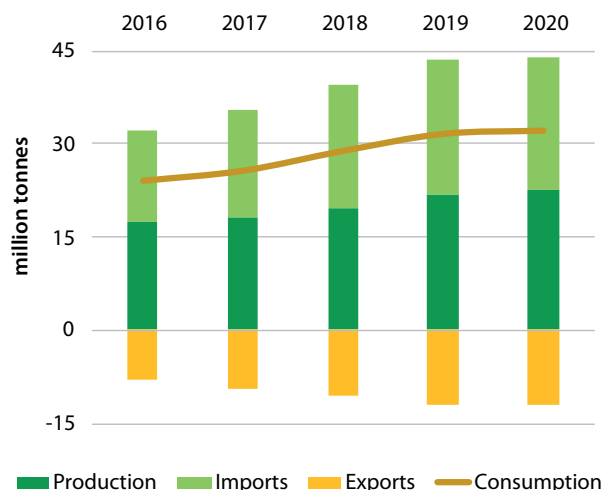


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

GRAPH 6.2

Europe: Wood pellet production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2021.

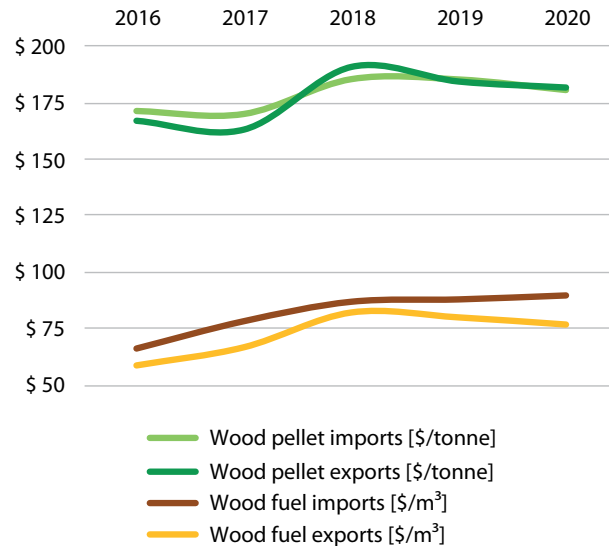


The import volume of wood pellets doubled in the Netherlands in 2020, year-on-year, to 2.4 million tonnes, and wood-pellet-generated energy accounted for about 10% of the total renewable energy used (Flach, 2021). Dutch wood-pellet consumption was estimated at about 2.9 million tonnes in 2020, of which about 2 million tonnes were used in co-firing with coal. The Dutch parliament voted in February 2021 to stop issuing new subsidies under the Stimulation of Sustainable Energy Production (SDE+) scheme for 50 planned forest-biomass-for-heat plants. It kept in place annual subsidies of €578.5 million for existing Dutch biomass plants primarily combusting wood pellets imported from the southeastern United States and eastern Europe (Catanoso, 2021). As reported by Flach (2021), the Government of the Netherlands plans to end subsidies for biomass-generated power in 2027 but maintain them for combined heat and power (CHP). In other developments, the Government of Finland announced that the use of peat for energy will be at least halved by 2030 as part of its emissions-cutting programme (Yle, 2021). This decision could create opportunities in the heating sector for the greater use of wood fuel sourced domestically and from the Russian Federation and the Baltic countries.

In Sweden, the wood-energy sector was less affected by the COVID-19 pandemic in 2020 than were other sectors across the wider economy (Swedish Energy Agency, 2021). The number of operating CHP plants using bioenergy sources increased from 230 in 2019 to 242 in 2020 (Svebio, 2020). Electricity generation was not as profitable for CHPs in 2020, however, due to low prices for electricity certificates resulting from an expansion of wind-power capacity and warmer-than-average temperatures (Statistics Sweden, 2021). Most of the wood damaged by spruce bark beetles in Sweden – about 8 million m³, in total – was used for energy in 2020 (Swedish Forest Agency, 2020). The Swedish Energy Agency has proposed an overhaul of policy instruments to protect CHP and fulfil article 14.1 of the EU Energy Efficiency Directive.

GRAPH 6.3

Europe: Unit value of traded wood fuel and wood pellets, 2016-2020



Source: UNECE/FAO database, 2021.

CHP generation is crucial in winter when demand peaks. The common location of CHP plants near final users reduces the need for powerlines and supports the stability of electricity grids, thereby reducing the risk of local power shortages. But low profitability can discourage new investment in CHP in favour of hot-water boilers. The Swedish Energy Agency will conduct an integrated assessment of the policy instruments affecting CHP, analyse their joint effects, and propose any needed changes (Swedish Energy Agency, 2020).

Unit values for traded wood fuel and wood pellets declined slightly in Europe in 2020, except for wood fuel imports, which increased marginally (graph 6.3).

Wood fuel production declined in the Western Balkans¹⁰ in 2020, with the exception of wood pellets (Agency for Statistics of Bosnia and Herzegovina, 2021; Croatian Bureau of Statistics, 2021; Institute for Statistics of Albania, 2021; Statistical Office of Montenegro, 2021; State Statistical Office of the Republic of North Macedonia, 2021; Statistical Office of the Republic of Serbia, 2021; Statistical Office of the Republic of Slovenia, 2021). Overall wood fuel production in the Western Balkans fell by about 0.8%, year-on-year, but still exceeded 29 million m³. Wood briquettes experienced the biggest fall, dropping by about 9%. The production of

¹⁰ The Western Balkans comprise Albania, Bosnia and Herzegovina, Croatia, North Macedonia, Montenegro, Serbia and Slovenia.

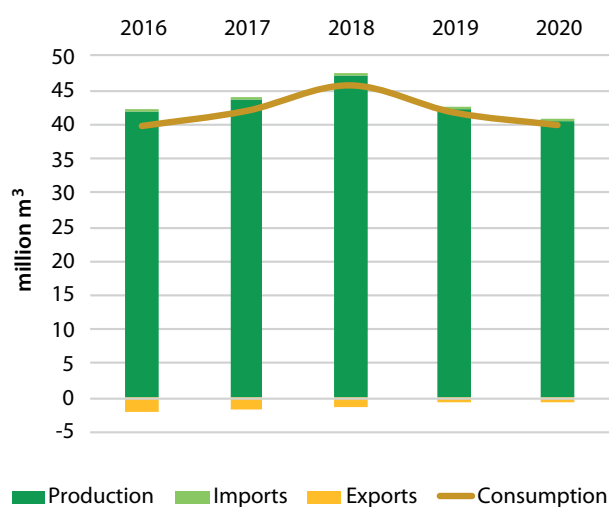
firewood and charcoal also declined, by 1.5% and 1.0%, respectively; wood-chip production fell by about 2%, to 1.64 million tonnes, but wood-pellet production rose by nearly 9%, to 1.6 million tonnes. Serbia remains the leading producer of wood pellets in the Western Balkans, and Croatia leads the production of wood chips. The pandemic has affected wood-pellet manufacturing, halting production for 2-3 weeks in April 2020; it also had an impact in the first five months of 2021. The lifting of pandemic restrictions will ease pressure, and a recovery in production is expected by the end of the year. In public policy, most Western Balkan countries have abandoned feed-in tariffs as an intervention to promote renewables, instead switching to more market-oriented tools such as auctions and concessions. Countries in the Western Balkans are introducing pathways for a clean-energy transition that will phase out coal-fired power plants (B. Glavonjić, personal communication, 2021).

Eastern Europe, Caucasus and Central Asia

After achieving record highs in 2018, wood fuel production and consumption in the EECCA continued to decline in 2020, both falling by 4.4%. Most production was used domestically or traded among EECCA countries; thus, subregional production and consumption in 2020 were similar to 2019 values, at 40.5 million m³ and 40.0 million m³, respectively (graph 6.4).

GRAPH 6.4

EECCA: Wood fuel production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

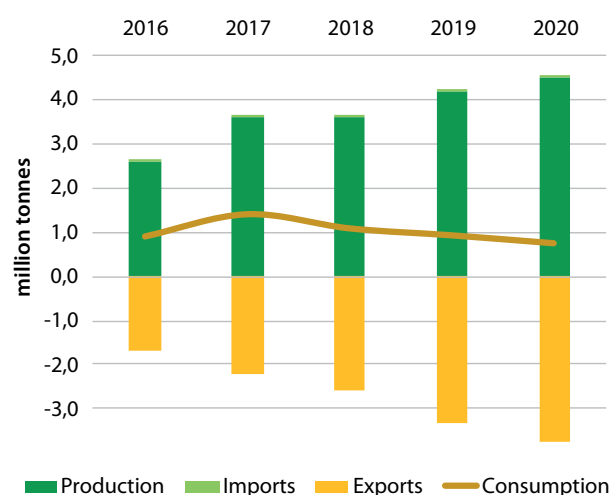
Source: FAOSTAT, 2021.

The situation was much more dynamic in the wood pellet market, with production increasing by 7% in the EECCA in 2020, to 4.5 million tonnes. The production of wood pellets has increased by about 70% in the subregion in the last five years (graph 6.5), driven mostly by demand elsewhere – about two-thirds of production is exported to Asia and Europe. The Russian Federation remains the main player in the EECCA for wood pellets, although the biggest increase in production in 2020 was in Belarus, with a leap of 35.2% (to 557,000 tonnes).

Wood pellet production in the Russian Federation grew by 6.5% in 2020, to 1.96 million tonnes. Output jumped by 17.6% between January and May 2021, year-on-year, to 874,000 tonnes. Russian wood pellet exports increased by 21.9% in the first quarter of 2021, with the top export markets in January being Denmark (205,700 tonnes), Belgium (89,600 tonnes) and the Republic of Korea (52,800 tonnes). In value terms, total Russian wood-pellet exports grew by 12.1% year-on-year, to \$64.7 million (WhatWood, 2021g). Current investments in pellet plants could increase annual production capacity in the Russian Federation by 118,000 tonnes. The intention of the Government of the Russian Federation is to reduce the number of wood-waste landfills and encourage exports of wood pellets and briquettes. VTK Invest plans to increase the recovery of residues from wood processing to produce 5,000 tonnes of wood charcoal briquettes and 25,000 tonnes of wood pellets annually (WhatWood, 2020b).

GRAPH 6.5

EECCA: Wood pellet production, trade and consumption, 2016-2020



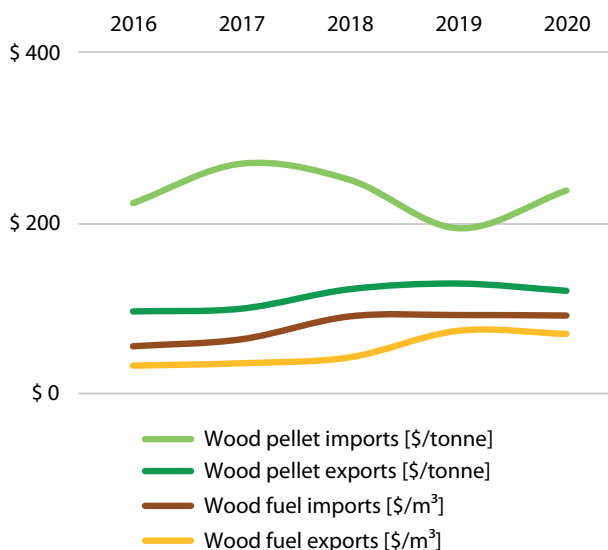
Note: Exports are shown as negative numbers.

Source: FAOSTAT, 2021.

The average export unit value for wood fuel in the Russian Federation in 2020 was \$70 per m³ (graph 6.6). The export price of wood pellets decreased slightly, to \$121 per tonne, due mainly to a relatively stable exchange rate between the Russian rouble and the euro.

GRAPH 6.6

EECCA: Unit value of traded wood fuel and wood pellets, 2016-2020



Source: FAOSTAT, 2021.

North America

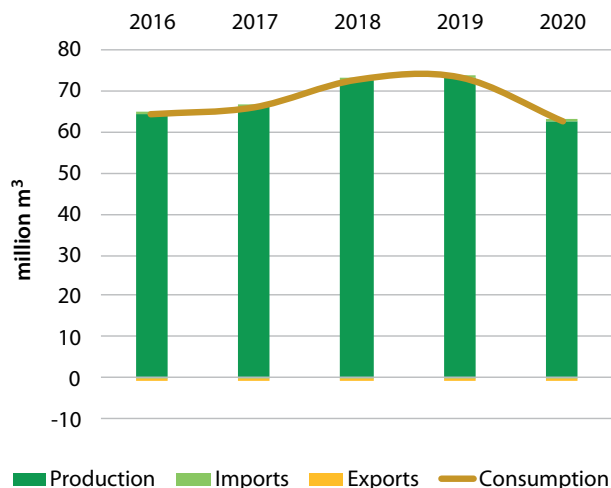
According to UNECE/FAO statistics, North America produced 62.3 million m³ of wood fuel in 2020, down by 14.9% compared with 2019, and 12.24 million tonnes of wood pellets, up by 5.4% (graph 6.7 and graph 6.8).

Other than pulping liquor and solid wood wastes produced and consumed in the wood products industry, wood pellets are the only commercial wood fuel produced in Canada at an industrial scale (Statistics Canada, 2021b). Wood pellet production continues to lag behind installed capacity, which the industry reported at 5.05 million tonnes per year in 2020 (Canadian Biomass, 2021). The retail price of wood pellets in Canada is averaging C\$340 per tonne; most pellets for retail use are sold in 18.1-kg (40-lb) bags for C\$6-7 per bag. Wholesale prices for export-oriented pellets have been steady, at approximately C\$143 per tonne (Statistics Canada, 2021a).

The Canadian energy policy is dominated by the Clean Fuel Standard, which is designed to reduce national greenhouse-

GRAPH 6.7

North America: Wood fuel production, trade and consumption, 2016-2020

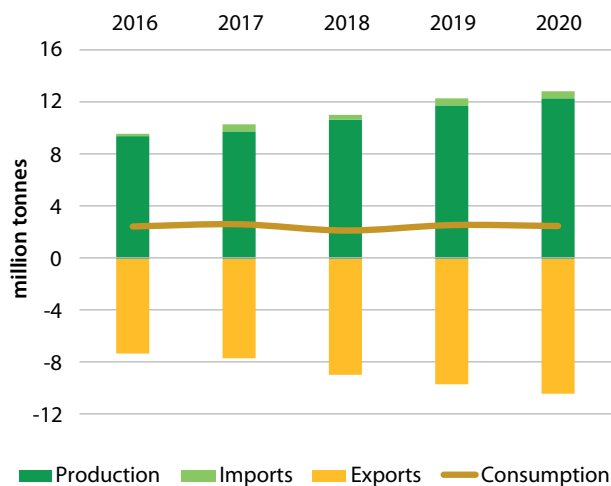


Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2020.

GRAPH 6.8

North America: Wood pellet production, trade and consumption, 2016-2020



Note: Exports are shown as negative numbers.

Source: UNECE/FAO database, 2020.

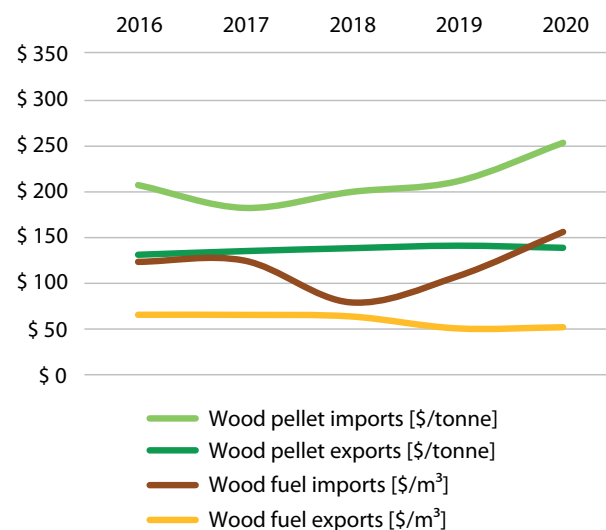
gas emissions by 13% by 2030 (ECCC, 2018). The Clean Fuel Standard is focused on liquid fuels, and concerns have been raised that this will limit the contributions of solid wood fuels and stationary energy plants using biomass (Murray, 2019). Other policies at the provincial and federal levels could have a larger impact on wood-energy markets, to the extent that an additional 2-5 million m³ of wood resources could be required nationally to meet various policy initiatives by 2030. This might result in an increase in forest removals of 3.1-5.6% compared with levels in 2015 (Giuntoli, 2020).

Energy production from renewable sources continues to increase in the United States. Renewable-energy production grew by 13% over the five years from 2016 to 2020, but energy from wood fuels was 4% lower in 2020 compared with 2016 (EIA, 2021a). The production of wood fibre densified into pellets is distributed over 84 facilities in the United States, with more than 70% of milling capacity located in the country's southeast to supply the European market (EIA, 2021b). United States wood pellet production was down by 7% in the first quarter of 2021 compared with the same period in 2020.

The average price of wood pellets in the United States in domestic and export markets showed an overall upward trend between 2016 and 2020, with the average domestic price rising by 16% in real terms (constant 2020 US dollars) (from \$166 per tonne to \$192 per tonne) and the average export price increasing by 21% (from \$152 per tonne to \$183 per tonne). The residential consumption of wood energy for heating in the United States could be stimulated by the Biomass Thermal Utilization (BTU) Act under the Omnibus appropriations and COVID-19 relief package of 2020, which expands energy tax credits to residential investments to install high-efficiency biomass heating units (NCSL, 2021).

The sustainability of wood-pellet production in the United States southeast destined for the EU and the United Kingdom continues to be debated in public media and other forums (e.g. Popkin, 2021; Hodgson, 2021). Science-based reports assessing the integrity of carbon pools from forests used to procure fibre for pelletization suggest that carbon stocks are not being negatively affected, and new demand could contribute to the growth and regrowth of wood fibres (Aguilar *et al.*, 2020; Cowie *et al.*, 2021).

Graph 6.9 shows a gap between declared unit values for imported and exported pellets, which arises because of the export of utility-grade pellets and the import of premium bagged product.

GRAPH 6.9
North America: Declared unit value of traded wood fuel and wood pellets, 2016-2020


Source: UNECE/FAO database, 2021.


Extraregional influences on the UNECE

The UNECE region dominates global trade in wood energy. The United States is the world's top exporter, with a total export value exceeding \$1 billion in 2020 (table 6.1). Viet Nam's wood-pellet production is expanding rapidly, however, reaching nearly 3.1 million tonnes, all of which is exported. This country has now overtaken Canada as the world's second-largest exporter by volume (Canada remains the second largest producer of wood pellets).

Vietnamese production is exported to the two main markets for wood pellets outside the UNECE region – the Republic of Korea and Japan, which imported about 3 million and 2 million tonnes of wood pellets in 2020, respectively (table 6.2).

TABLE 6.1

Global top ten wood fuel and wood pellet exporters, 2020

| | Wood fuel | | Wood pellets | | Total |
|--------------------|----------------------|------------|--------------|------------|------------|
| | 1,000 m ³ | \$ million | 1,000 tonnes | \$ million | \$ million |
| United States | 366* | 21.7* | 7,257 | 982 | 1,004 |
| Latvia | 490 | 58.9 | 2,350 | 373 | 432 |
| Canada | 110 | 4.7 | 2,901 | 406 | 410 |
| Viet Nam* | 3 | 0.4 | 3,077 | 309 | 310 |
| Russian Federation | 175 | 8.9 | 2,294 | 290 | 299 |
| Estonia | 206 | 19 | 1,070 | 184 | 203 |
| Denmark | 46 | 1.3 | 1,064 | 194 | 195 |
| Austria | 11 | 0.9 | 848 | 192 | 193 |
| Germany | 166 | 7.3 | 751 | 182 | 190 |
| Lithuania | 318 | 32 | 610 | 112 | 144 |

Note: * 2019 data.

Sources: Comtrade, 2021; FAOSTAT, 2021; UNECE/FAO database, 2021.

TABLE 6.2

Top wood fuel and wood pellet importers outside the UNECE region, 2020

| | Wood fuel | | Wood pellets | | Total |
|-------------------|----------------------|------------|--------------|------------|------------|
| | 1,000 m ³ | \$ million | 1,000 tonnes | \$ million | \$ million |
| Japan | 1.7 | 1.2 | 2,028 | 343.6 | 344.8 |
| Republic of Korea | 0.5 | 0.1 | 3,004 | 329.1 | 329.1 |
| South Africa | 666.3 | 23.2 | 1.3 | 0.3 | 23.5 |
| Eswatini* | 261.1 | 7.2 | 0.0 | 0.0 | 7.2 |
| China | 17.5 | 1.6 | 18.7 | 2.9 | 4.5 |
| Australia | 0.9 | 0.9 | 5.5 | 2.5 | 3.4 |
| India* | 15.2 | 2.4 | 1.2 | 0.3 | 2.7 |
| Malaysia* | 0.9 | 0.8 | 6.1 | 1.9 | 2.6 |
| Thailand* | 18.0 | 0.8 | 17.3 | 1.1 | 1.9 |
| Saudi Arabia* | 8.5 | 1.4 | 0.4 | 0.2 | 1.6 |

Note: UNECE-region countries not included; * 2019 data.

Sources: Comtrade, 2021; FAOSTAT, 2021.

UNECE subregional data summary and forecast

Table 6.3 summarizes data on the production, consumption, trade and declared value of cross-border trade of wood fuel and wood pellets in the UNECE subregions. Additional information and the complete forest products database is available at: www.unece.org/forests/fpamr2021-annex.

Initial data supplied by UNECE member States (all figures are year-on-year) indicate that the production of wood pellets in the UNECE region will increase by 6.3% in 2021 and by 4.9% in 2022. Subregionally, the forecast is for wood-pellet production to grow in Europe by 5.0% in 2021 and by 4.6% in 2022; to increase in the EECCA by 15% in 2021 and 2022; and to increase in North America by 6.1% in 2021 and by 2.7% in 2022.



TABLE 6.3

Wood fuel and wood pellets production, imports, exports, net apparent consumption and traded unit value, UNECE subregions, 2016-2020

| | 2016 | 2017 | 2018 | 2019 | 2020 | Change 2019-2020 |
|--|---------|---------|---------|---------|---------|------------------|
| EUROPE | | | | | | |
| Wood fuel | | | | | | |
| Production (1,000 m ³) | 139,734 | 139,903 | 142,892 | 144,306 | 143,187 | -0.8% |
| Imports (1,000 m ³) | 4,928 | 4,117 | 4,367 | 4,202 | 3,094 | -26.4% |
| Exports (1,000 m ³) | 5,868 | 5,402 | 5,132 | 4,850 | 4,834 | -0.3% |
| Consumption (1,000 m ³) | 138,794 | 138,617 | 142,128 | 143,658 | 141,446 | -1.5% |
| Import unit value (\$/m ³) | 66 | 78 | 86 | 87 | 89 | 2.0% |
| Export unit value (\$/m ³) | 58 | 66 | 82 | 80 | 77 | -4.0% |
| Wood pellets | | | | | | |
| Production (1,000 tonnes) | 17,366 | 18,349 | 19,666 | 21,852 | 22,506 | 3.0% |
| Imports (1,000 tonnes) | 14,852 | 17,050 | 19,841 | 21,721 | 21,651 | -0.3% |
| Exports (1,000 tonnes) | 7,979 | 9,543 | 10,483 | 11,821 | 11,891 | 0.6% |
| Consumption (1,000 tonnes) | 24,240 | 25,856 | 29,025 | 31,752 | 32,265 | 1.6% |
| Import unit value (\$/tonne) | 172 | 170 | 186 | 185 | 181 | -2.5% |
| Export unit value (\$/tonne) | 167 | 163 | 191 | 184 | 182 | -1.5% |
| EECCA | | | | | | |
| Wood fuel | | | | | | |
| Production (1,000 m ³) | 41,882 | 43,673 | 47,037 | 42,394 | 40,537 | -4.4% |
| Imports (1,000 m ³) | 9 | 9 | 44 | 42 | 44 | 3.9% |
| Exports (1,000 m ³) | 1,961 | 1,573 | 1,227 | 539 | 520 | -3.6% |
| Consumption (1,000 m ³) | 39,930 | 42,108 | 45,854 | 41,898 | 40,061 | -4.4% |
| Import unit value (\$/m ³) | 55 | 63 | 89 | 91 | 90 | -0.6% |
| Export unit value (\$/m ³) | 32 | 35 | 42 | 74 | 70 | -5.1% |
| Wood pellets | | | | | | |
| Production (1,000 tonnes) | 2,573 | 3,607 | 3,624 | 4,199 | 4,495 | 7.0% |
| Imports (1,000 tonnes) | 14 | 17 | 17 | 22 | 14 | -35.4% |
| Exports (1,000 tonnes) | 1,694 | 2,223 | 2,563 | 3,302 | 3,773 | 14.2% |
| Consumption (1,000 tonnes) | 893 | 1,401 | 1,078 | 919 | 737 | -19.8% |
| Import unit value (\$/tonne) | 222 | 269 | 250 | 192 | 237 | 23.2% |
| Export unit value (\$/tonne) | 97 | 100 | 122 | 129 | 121 | -6.5% |
| NORTH AMERICA | | | | | | |
| Wood fuel | | | | | | |
| Production (1,000 m ³) | 64,206 | 65,904 | 72,782 | 73,177 | 62,276 | -14.9% |
| Imports (1,000 m ³) | 153 | 149 | 165 | 92 | 76 | -17.4% |
| Exports (1,000 m ³) | 352 | 356 | 401 | 125 | 111 | -11.0% |
| Consumption (1,000 m ³) | 64,006 | 65,696 | 72,547 | 73,144 | 62,241 | -14.9% |
| Import unit value (\$/m ³) | 122 | 124 | 78 | 212 | 310 | 46.1% |
| Export unit value (\$/m ³) | 66 | 66 | 64 | 50 | 52 | 2.6% |
| Wood pellets | | | | | | |
| Production (1,000 tonnes) | 9,300 | 9,824 | 10,628 | 11,724 | 12,354 | 5.4% |
| Imports (1,000 tonnes) | 338 | 429 | 336 | 468 | 400 | -14.6% |
| Exports (1,000 tonnes) | 7,238 | 7,663 | 8,919 | 9,673 | 10,316 | 6.6% |
| Consumption (1,000 tonnes) | 2,399 | 2,590 | 2,045 | 2,519 | 2,437 | -3.2% |
| Import unit value (\$/tonne) | 207 | 182 | 199 | 211 | 253 | 20.1% |
| Export unit value (\$/tonne) | 130 | 135 | 139 | 142 | 139 | -1.9% |

Note: Unit values are included as an indicator of price trends and are derived by dividing the declared monetary value of imported and exported products by the volume of these products.

Sources: UNECE/FAO database, 2021; FAOSTAT, 2021.





Chapter 7

VALUE-ADDED
WOOD PRODUCTS

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Introduction and UNECE region overview

Value-added wood products are primary wood products that have been further processed into secondary products such as furniture, builders' joinery and carpentry (BJC), profiled wood, and engineered wood products (EWPs). Demand is linked to drivers such as economic growth; housing and construction; home renovation; fashion and design; and demographics.

BJC comprises a wide array of wood products, including wooden windows and doors; pre-assembled wooden flooring; posts and beams; and shakes and shingles. EWPs include I-beams (also called I-joists); finger-jointed sawnwood; glulam (sawnwood glued into beams); laminated veneer lumber (LVL); and mass timber panels, including cross-laminated timber (CLT). Profiled wood is wood shaped by machines, such as mouldings, tongue-and-groove, and lap siding.

The COVID-19 pandemic has had a surprising impact on value-added wood product demand, with people suddenly having more time for do-it-yourself projects. Initially, this was channelled into demand for terrace boards and support structures, and later it developed into house-expansion projects, driving demand for home-renovation products such as window and door frames, mouldings and various EWPs.

Improvements and repairs of owner-occupied homes will remain solid in the United States through 2021 and into 2022.

The office-furniture segment has been a clear loser in the pandemic, with stay-at-home orders reducing demand. On the other hand, such orders have meant that workers have focused on their homes and comfort, and many have adapted their spaces to the needs of working from home. This will likely have longer-term effects on office workspace design and use and could lead to a reduction in total required space as more people work remotely at least part of the time.

Building with wood has been boosted by the introduction of CLT, particularly in markets with a lower share of wood construction. Global CLT production capacity was estimated at 2.8 million m³ in 2020, and actual production likely exceeded 2 million m³. Capacity continues to expand rapidly and could reach 4 million m³ by 2025.

Combined, Austria, the Czech Republic, Germany, Italy and Switzerland are reported to have produced slightly more than 1 million m³ of CLT in 2020, an increase of 15% over 2019. Growth is expected to continue in these countries at a similar or even slightly higher rate in 2021. The five countries account for more than half of global CLT production, and their capacity is projected to expand by 650,000 m³ across 2021 and 2022.

Furniture

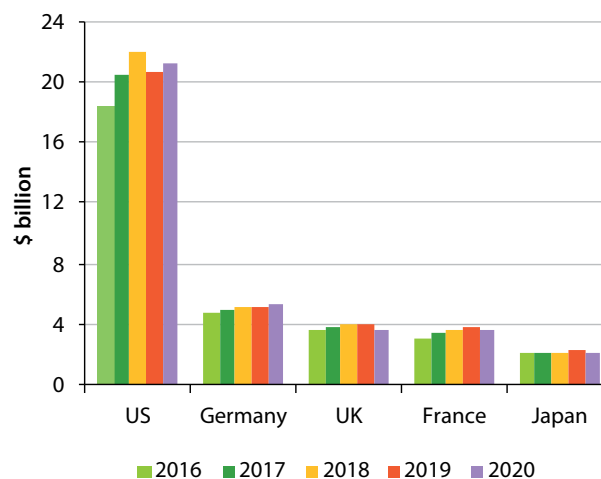
The furniture sector is a global industry, with specialized sourcing, design, manufacturing, sales and logistics, and it is also a significant consumer of wood raw material. Wooden furniture is classified here as part of value-added wood products, a term used synonymously with secondary wood products (i.e. primary products that have been reprocessed into new products with added value).

The furniture sector had a challenging year in 2020, with the pandemic hitting both demand and supply. The office-furniture segment was the clear loser, with stay-at-home orders reducing the demand for office-furniture. Many workers have had the opportunity to focus on home and comfort and to adapt their spaces to the needs of working from home. Even if this becomes a more permanent phenomenon, however, it is unlikely to lead to significant spending on office furniture. Most urban people do not have dedicated workspaces at home or, if they do, the space is relatively small. Moreover, teleworkers often need to furnish their workspaces at their own cost, and those companies and people with dedicated budgets for home offices often turn to standard office furniture. The impacts on office spaces and demand for office furniture is expected to unfold in three phases: the adoption of urgent solutions in the emergency; medium-term solutions; and long-term changes in office and public spaces. This will likely lead to a reduction in the total required office space as more people work remotely at least part of the time.

Worldwide, the consumption of furniture contracted by 10% (\$40 billion) in 2020, to about \$400 billion. Nevertheless, growth in furniture production and trade is expected to

GRAPH 7.1

Wooden furniture imports, top five importing countries, 2016-2020



Source: UN Comtrade, 2021.

resume in 2021, with pre-pandemic import levels likely to be attained in 2022 (CSIL Milano, 2021). The top five countries for wood-furniture imports accounted for about \$36 billion of global imports in 2020, albeit with varying trends (graph 7.1 and table 7.1).

A rebound in furniture consumption will depend on economic stimulus packages and the extent of new housing construction. More than 50% of global furniture manufacturing takes place in Asia – mainly China and Viet Nam, which lack abundant high-quality domestic hardwood

TABLE 7.1

Value of wooden furniture imports, and market share of supplying regions, top five importing countries, 2019-2020

| | United States | | Germany | | France | | United Kingdom | | Japan | |
|--|-------------------|------|---------|------|--------|------|----------------|------|-------|------|
| | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 |
| Total value of imports (\$ billion) | 20.7 | 21.2 | 5.2 | 5.4 | 4.1 | 3.6 | 3.8 | 3.6 | 2.3 | 2.3 |
| | Origin (%) | | | | | | | | | |
| Asia | 77.2 | 79.1 | 18.5 | 20.0 | 55.0 | 56.8 | 25.2 | 22.2 | 93.1 | 93.9 |
| Europe | 9.3 | 8.3 | 80.0 | 78.4 | 38.3 | 36.4 | 73.1 | 76.9 | 6.4 | 5.6 |
| North America | 7.2 | 6.0 | 0.1 | 0.1 | 3.5 | 3.6 | 0.2 | 0.2 | 0.4 | 0.4 |
| Latin America | 6.3 | 6.7 | 0.3 | 0.3 | 2.0 | 1.9 | 0.8 | 0.7 | 0.0 | 0.0 |
| Other | 0.0 | 0.0 | 1.2 | 1.2 | 1.1 | 1.4 | 0.6 | 0.0 | 0.0 | 0.0 |

Source: UN Comtrade, 2021.

production and thus import large volumes of raw materials (logs). Demand has clearly shifted to temperate hardwoods for their visual appearance and sustainability, making Europe, North America and the Russian Federation the main supply regions. Uncertainty about future supplies from the Russian Federation, mainly because of announced roundwood export tariffs in 2022, combined with tensions in United States-China trade, make global hardwood log supply a challenge for Asian furniture manufacturers. Furniture producers in the UNECE region are counting on local wood supply, increased automation in production, a higher-end-market focus and shorter delivery times to obtain a competitive advantage.

The pandemic has had significant effects on the production and consumption of furniture in the EECCA. Furniture and wood-based panels production in the Russian Federation, and thus the EECCA, dropped by 40-50%, year-on-year, during the April-May 2020 lockdowns, with many enterprises using the downtime for preventive maintenance (UNECE/FAO, 2021a). Many households had disposable household income that was not spent on travel or purchases (stifled by COVID-19 measures) and used it for home improvements, repairs and furniture purchases (in the middle price segment) (WhatWood, 2020b). The net result was that wooden furniture production rebounded strongly in the EECCA in the second half of 2020 and finished the year with an overall increase of about 8% (UNECE/FAO, 2021a).

Wood is an important raw material for furniture production and consumption in the Russian Federation, with 55-57% of furniture made of wood or wood-based materials (Russian Timber Industry, 2021). The Russian Federation is reported to have reduced furniture imports by 6.8% in 2020 (Russian Timber Industry, 2021).

Furniture e-commerce has developed steadily in recent years, but pandemic-related closures of traditional furniture stores and showrooms meant that even more people started shopping online in 2020. This partially compensated for a sharp decrease in traditional furniture sales, with the global value of furniture sold online registering a double-digit increase (and now representing up to 10% of total sales value). The most significant growth in e-commerce furniture sales was in the United States and Europe, followed by China. North America is the largest e-commerce market, followed by China and Europe; combined, these markets represented over 90% of e-commerce furniture sales worldwide in 2020 (CSIL Milano, 2021).

Builders' joinery and carpentry, and profiled wood

Pessimistic early predictions about the impact of the pandemic on forest product markets have mostly proved wrong. Forecasts in early 2020 were particularly negative for the BJC and profiled-wood segments. But stay-at-home orders meant that people had more time for home-improvement projects and more available funds due to a lack of travel and other entertainment options. Do-it-yourself projects started as soon as lockdowns commenced, first to accommodate home workspaces and then, over the northern summer, to expand outside terraces, both for personal and restaurant use, and, finally, to expand houses to satisfy demand for more space. The top five markets for BJC imports accounted for more than half the global trade and showed mixed results (graph 7.2 and table 7.2). Home renovation is a key demand driver for BJs and mouldings because upgrading projects tend to use higher-end materials.

TABLE 7.2

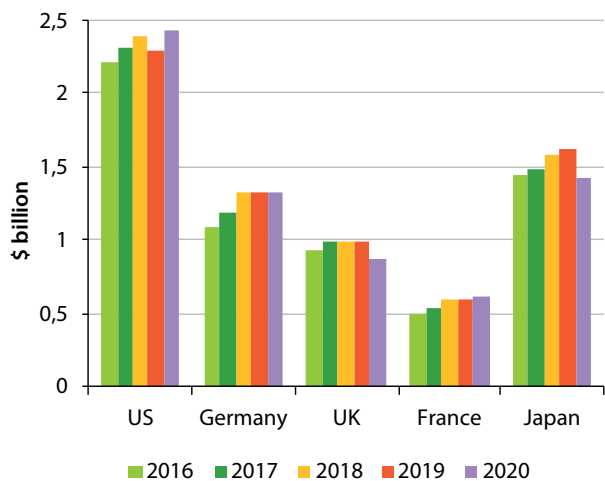
Value of builders' joinery and carpentry imports, and market share of supplying regions, top five importing countries, 2019-2020

| | United States | | Germany | | France | | United Kingdom | | Japan | |
|--|-------------------|------|---------|------|--------|------|----------------|------|-------|------|
| | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 |
| Total value of imports (\$ billion) | 2.3 | 2.4 | 1.3 | 1.3 | 1.0 | 0.9 | 0.6 | 0.6 | 1.6 | 1.4 |
| | Origin (%) | | | | | | | | | |
| Asia | 23.1 | 21.1 | 11.9 | 11.9 | 34.8 | 37.8 | 8.7 | 8.0 | 74.2 | 68.9 |
| Europe | 7.1 | 6.8 | 86.5 | 86.5 | 60.9 | 58.2 | 85.5 | 86.0 | 21.5 | 27.1 |
| North America | 51.5 | 49.9 | 0.2 | 0.1 | 0.7 | 0.7 | 0.8 | 0.5 | 1.2 | 0.8 |
| Latin America | 17.2 | 21.7 | 0.0 | 0.0 | 1.8 | 1.5 | 2.2 | 2.5 | 0.0 | 0.0 |
| Other | 0.9 | 0.5 | 1.4 | 1.5 | 1.8 | 1.7 | 2.9 | 3.0 | 3.1 | 3.2 |

Source: UN Comtrade, 2021.

GRAPH 7.2

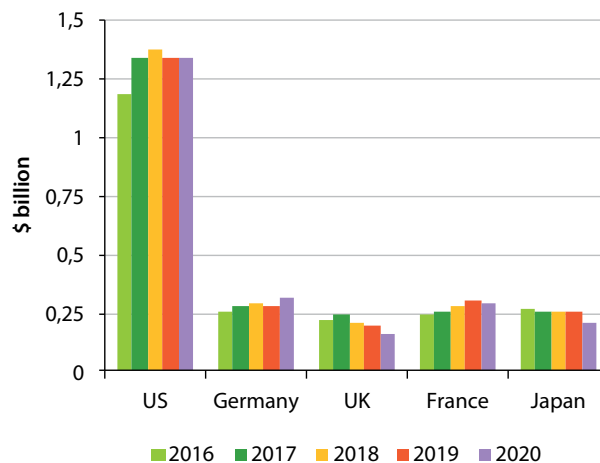
Builders' joinery and carpentry imports, top five importing countries, 2016-2020



Source: UN Comtrade, 2021.

GRAPH 7.3

Profiled-wood imports, top five importing countries, 2016-2020



Source: UN Comtrade, 2021.

TABLE 7.3

Value of profiled-wood imports, and market share of supplying regions, top five importing countries, 2019-2020

| | United States | | Germany | | France | | United Kingdom | | Japan | |
|--|-------------------|------|---------|------|--------|------|----------------|------|-------|------|
| | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 |
| Total value of imports (\$ billion) | 1.3 | 1.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 |
| | Origin (%) | | | | | | | | | |
| Asia | 27.4 | 23.2 | 19.3 | 15.8 | 42.6 | 45.7 | 8.1 | 6.1 | 76.1 | 75.6 |
| Europe | 4.4 | 3.4 | 71.2 | 75.5 | 51.6 | 50.0 | 54.3 | 59.2 | 7.2 | 8.2 |
| North America | 8.2 | 8.9 | 0.6 | 0.5 | 2.1 | 1.4 | 0.9 | 0.6 | 8.9 | 8.5 |
| Latin America | 58.4 | 62.4 | 5.0 | 3.0 | 2.0 | 1.5 | 34.3 | 30.4 | 5.5 | 6.0 |
| Other | 1.6 | 2.1 | 4.0 | 5.1 | 1.8 | 1.5 | 2.4 | 3.8 | 2.2 | 1.6 |

Source: UN Comtrade, 2020



The top five markets for profiled wood are the same as those for BJC, and market trends were similar in 2020. Export markets for profiled wood are highly concentrated, with imports by the top five importing countries accounting for more than half the global trade, and these returned mixed results in 2020 (graph 7.3 and table 7.3). Consumer preference in the BJC and profiled-wood sector is evolving towards materials with easy maintenance, sharp, crisp lines and long durability. This means that natural (solid) wood is tending to lose market share to MDF, plastics, EWPs and cement-based products. Finger-jointed pine and clear mouldings are being replaced even in the highest-end projects with MDF-based products, with board and finish quality improving significantly in recent years.

The market outlook for BJC products in North America is positive due to continued investment by homeowners in the upkeep and improvement of their houses, thanks largely to financial boosts from federal stimulus payments in both Canada and the United States and a strong appreciation in house prices. The Leading Indicator of Remodeling Activity predicts that growth in improvements and repairs of owner-occupied homes will remain solid in the United States through 2021 and into 2022, with 4.8% growth by the first quarter of 2022, year-on-year. Even though the recent surge in do-it-yourself activity is slackening as economies open up, homeowners are undertaking larger discretionary renovations that had been deferred earlier in the pandemic (Harvard Joint Center for Housing Studies, 2021b).

Engineered wood products

■ GLULAM TIMBER

Information on glulam production and consumption is scattered; it is unavailable in a standardized format for Europe and the EECCA, and therefore no totals for production or consumption can be provided for those two subregions nor for the UNECE region as a whole. The availability of data on the trade of EWPs is expected to improve significantly in 2022 with the introduction of the new trade classifications of glulam (4418.81), CLT (4418.82) and I-beams (4418.83) in the global commodities classification system of the World Customs Organization (WCO, 2019).

Austria is the world's biggest glulam producer; production there was estimated at 1.59 million m³ in 2020 and is forecast to reach 1.68 million m³ in 2021. Output in Germany, the second-biggest glulam producer, was estimated at 1.32 million m³ in 2020 and is forecast to total 1.37 million m³ in 2021. Significant increases in production capacity are planned in both countries (Timber online, 2021b).

Japan is traditionally an import-dependent market for glulam and a main destination for this product from the UNECE

region. Japan's glulam imports increased by 15.4% in 2020, to 398,000 m³, with Finland (238,000 m³), Romania (61,700 m³) and Estonia (50,400 m³) the top three suppliers (Ministry of Finance of Japan, 2021). European countries imported 35,000 m³ of glulam in 2020, a decrease of about 40% over 2019 (Eurostat, 2021).

The overall production of glulam in North America declined from 750,000 m³ in 2006 to 285,000 m³ in 2009 but then grew consistently and significantly between 2010 and 2019. Production declined by 3.6% in 2020, the first contraction for a decade. The outlook is positive, however, and production is expected to reach 483,000 m³ in 2021 (table 7.4).

TABLE 7.4

Glulam production and consumption, North America, 2019-2021

| | 2019 | 2020 | 2021(f) | Change 2019-2020 |
|--|-------------------------|------------|------------|---------------------|
| | (1,000 m ³) | | | (%) |
| United States | | | | |
| Production | 431 | 414 | 448 | -3.9 |
| Total consumption | 435 | 419 | 452 | -3.9 |
| Residential | 263 | 257 | 300 | -2.3 |
| Non-residential | 155 | 146 | 135 | -5.9 |
| Industrial, other | 17 | 15 | 17 | -3.9 |
| Inventory change | -5 | -5 | -5 | |
| Canada | | | | |
| Production | 35 | 35 | 35 | |
| North America, total production | 466 | 449 | 483 | -3.6 |

Note: f = forecast; 1 m³ = 650 board feet; Canadian imports are assumed to be minimal.

Source: APA, 2021a.

■ LAMINATED VENEER LUMBER

LVL is produced and consumed in Europe, but data and market intelligence for that subregion were unavailable for this report. The status of LVL manufacture and markets in the EECCA is also unknown.

In North America, most LVL is ultimately used in new-home construction. In 2021, 71% of the volume is forecast to be used for beams and headers, rim boards and like applications and the balance for I-joist flanges. Rim boards are used on

TABLE 7.5

Laminated veneer lumber consumption and production in North America, 2019-2021

| | 2019 | 2020 | 2021(f) | Change 2019-2020 |
|------------------------------|-------------------------|--------------|--------------|---------------------|
| | (1,000 m ³) | | | (%) |
| Consumption | | | | |
| I-beam flanges | 561 | 592 | 702 | 5.6 |
| Beams, headers, other | 1,532 | 1,543 | 1,699 | 0.7 |
| Total consumption | 2,093 | 2,135 | 2,401 | 2.0 |
| Production | | | | |
| United States | 1,909 | 1,954 | 2,208 | 2.4 |
| Canada | 184 | 181 | 198 | -1.5 |
| Total production | 2,093 | 2,135 | 2,407 | 2.0 |

Note: f = forecast; 35.315 cubic feet = 1 m³.

Source: APA, 2021a.

the perimeter of I-beam floor systems to provide fastening points for I-beams and to assist in the distribution of loads from walls. LVL production peaked along with the United States housing market in 2005 at 2.6 million m³ but has since declined along with I-beam production and the housing market. An estimated 2.4 million m³ of LVL is forecast to be produced in 2021 (table 7.5) – which would be the fourth-highest annual volume ever manufactured in North America (APA, 2021a).

LVL is well-accepted for use in beams and headers, and growth should return with an improving housing market. Like other EWPs, LVL enables the use of longer spans and fewer



pieces to carry the same loads compared with conventional wood products.

In addition to the EWPs discussed in this chapter, a number of structural composite lumber products are manufactured in North America, including parallel strand lumber (PSL), laminated strand lumber (LSL) and oriented strand lumber (OSL). Each of these is made from strands of wood of varying lengths and widths to achieve different strength and stiffness properties. PSL and LSL have been manufactured for several years, primarily by one company, and production volumes have been relatively low compared with other EWPs. Uses for OSL are expected to be the same as for solid sawn lumber, timbers and glulam, such as posts, beams, headers, rim boards and structural framing lumber.

■ CROSS-LAMINATED TIMBER

CLT¹¹ is an inexpensive, flexible and time-saving substitute for conventional construction materials such as concrete, steel and masonry. Often referred to in North America as “mass timber”, CLT was first developed in Europe in the early 1990s and is now an important construction material in the UNECE region. CLT has great potential to substitute for energy- and carbon-intensive materials in midrise multifamily and non-residential construction.

The prefabrication of CLT to desired dimensions and shapes reduces on-site waste and installation time. An interesting dynamic is “adhesive-free” or mechanically fastened CLT production, which uses nails, wooden dowels and other alternative panel integration systems. There are some 30 manufacturers of nailed cross-laminated panels in Europe, marketed as MassivHolzMauer, or MHM; another ten manufacturers produce panels bonded with wooden dowels (Forest Business Network, 2020).

Global CLT production capacity was estimated at 2.8 million m³ in 2020, comprising 48% in Europe, 43% in North America, 6% in Oceania and 3% in Asia; actual production likely exceeded 2 million m³ in 2020. CLT production capacity continues to expand rapidly and is projected to reach 4 million m³ by 2025 (Forest Business Network, 2020).

Combined, producers in Austria, the Czech Republic, Germany, Italy and Switzerland are reported to have produced slightly more than 1 million m³ of CLT in 2020, an increase of 15% over 2019. The sector in these five countries is expected to continue growing in 2021 at a similar or even slightly higher rate (Holzkurier, 2021). Production in these countries accounts for more than half of the produced volume of CLT, and further

¹¹ CLT includes nail-laminated timber, dowel-laminated timber and mass plywood panel.

expansions of capacity (+650,000 m³) are expected in 2021 and 2022 (Timber online, 2021c).

The production of CLT is set to extend to other countries in Europe, with large new lines to begin operation. The reported current capacity of 227,000 m³ is expected to increase to 462,000 m³ in 2022.

Two CLT plants are being built or are in the testing phase in the Russian Federation and Ukraine (Ledinek, 2021a; 2021b).

Various products categorized as mass timber products are in production in North America. In 2018, ten CLT-manufacturing plants were reportedly in operation (five each in Canada and the United States), with a combined annual production capacity of about 400,000 m³ (Beck Group, 2018). In early 2021, 15 plants were producing mass timber panels in North America, with a further three under construction and three more announced. The current practical capacity of these plants is 1.7 million m³, but the majority (slightly over half) of this production continues to be aimed at non-structural applications, mainly industrial matting (platforms for equipment to work on in muddy or environmentally sensitive areas). Thus, the practical capacity of CLT production for structural application for use in buildings in North America was about 439,000 m³ in 2019, and this is expected to increase by another 62,000 m³ in 2021, excluding proposed new plants (Beck Group, 2020, 2021). Table 7.6 provides an estimate of actual CLT capacities for structural applications in 2020.



TABLE 7.6

Estimated CLT production capacity for structural applications of North American manufacturers, 2020

| Company | Location | Estimated CLT production capacity (1,000 m ³) |
|-------------------------------|----------------------------------|---|
| DR Johnson Wood Innovations | Oregon, United States | 280 |
| Element 5 | Ontario & Quebec, Canada | 50 |
| Freres | Oregon, United States | 96 |
| Kalesnikoff | British Columbia, Canada | 50 |
| Katerra | Washington, United States | 185 |
| LEAF Engineered Wood Products | Ontario, Canada | ... |
| Nordic Structures | Quebec, Canada | 80 |
| Smartlam North America | Montana & Alabama, United States | 70 |
| Sterling Solutions | Illinois & Texas, United States | ... |
| StructureCraft | British Columbia, Canada | ... |
| Structurlam | British Columbia, Canada | 70 |
| Texas CLT | Arkansas, United States | ... |
| Vaagen Timber | Washington, United States | 25 |

Sources: Beck Group, 2020; Brandt *et al.*, 2021; Forest Business Network, 2020; Katerra, 2020.



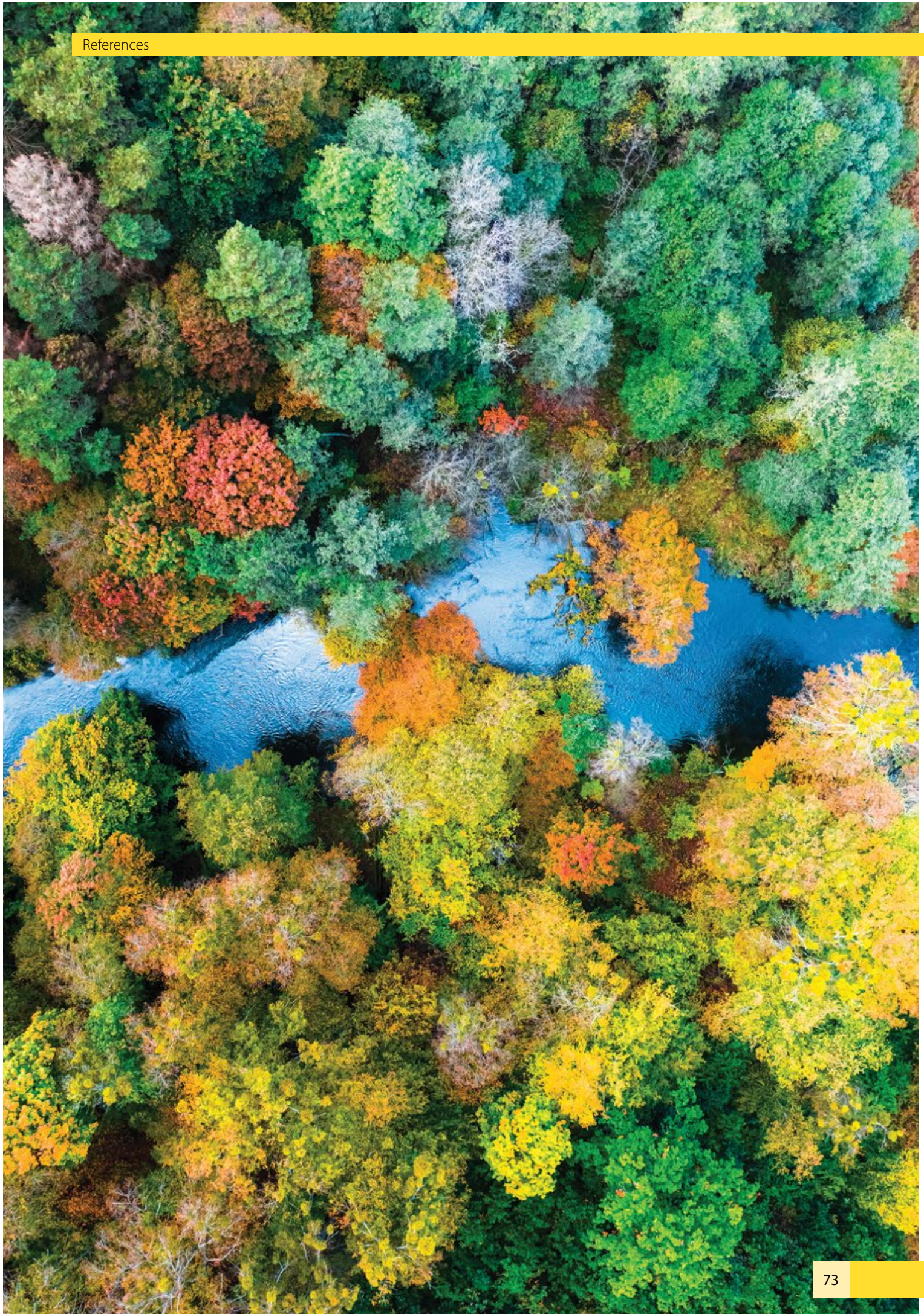
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All references can be found online at:

<https://unece.org/forestry-timber/documents/2021/11/reports/references-forest-products-annual-market-review-2020-2021>



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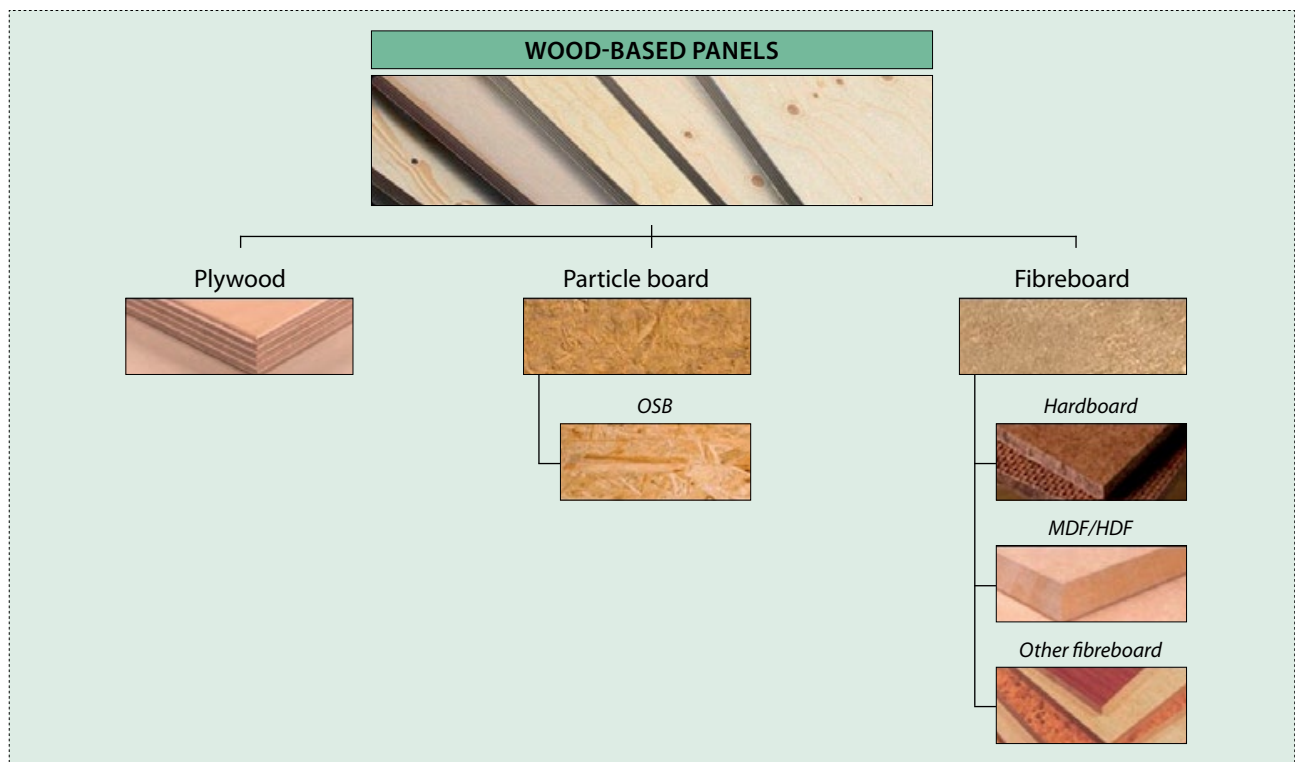
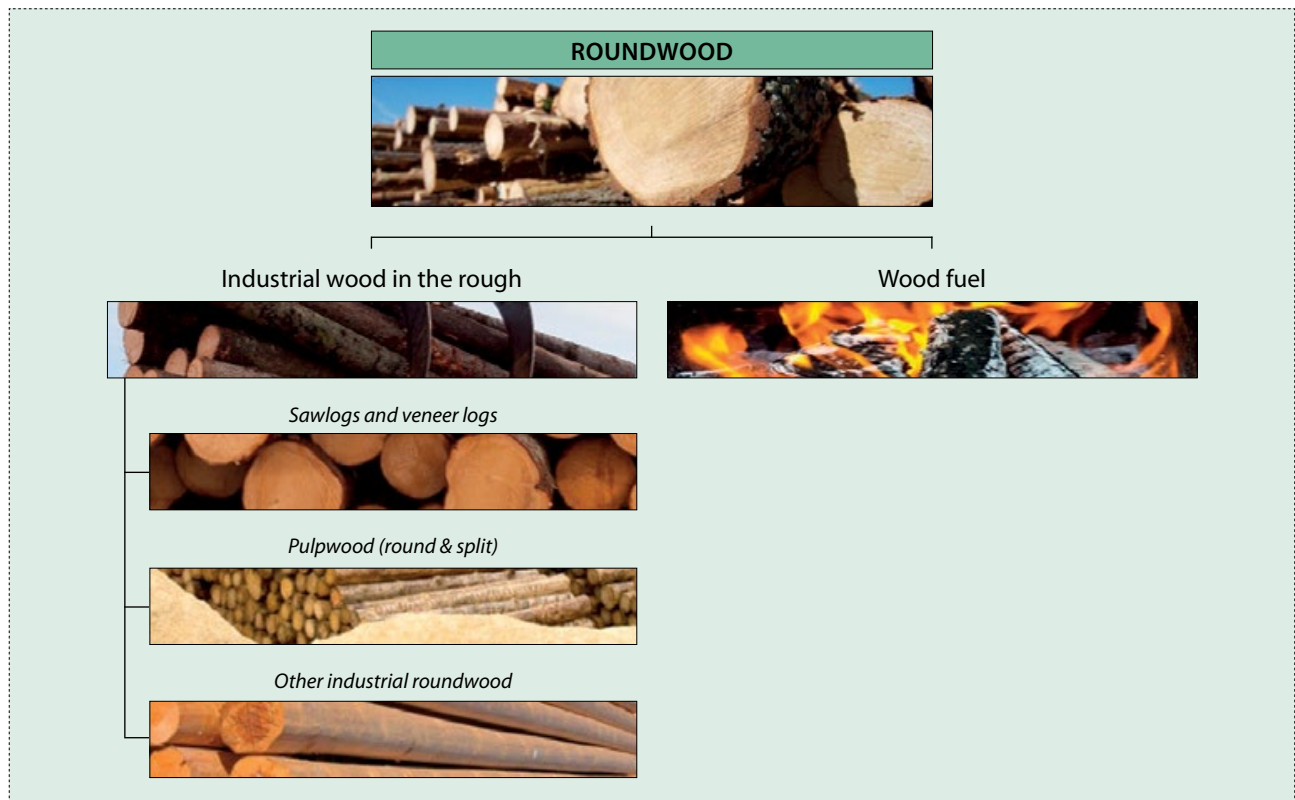
ANNEXES

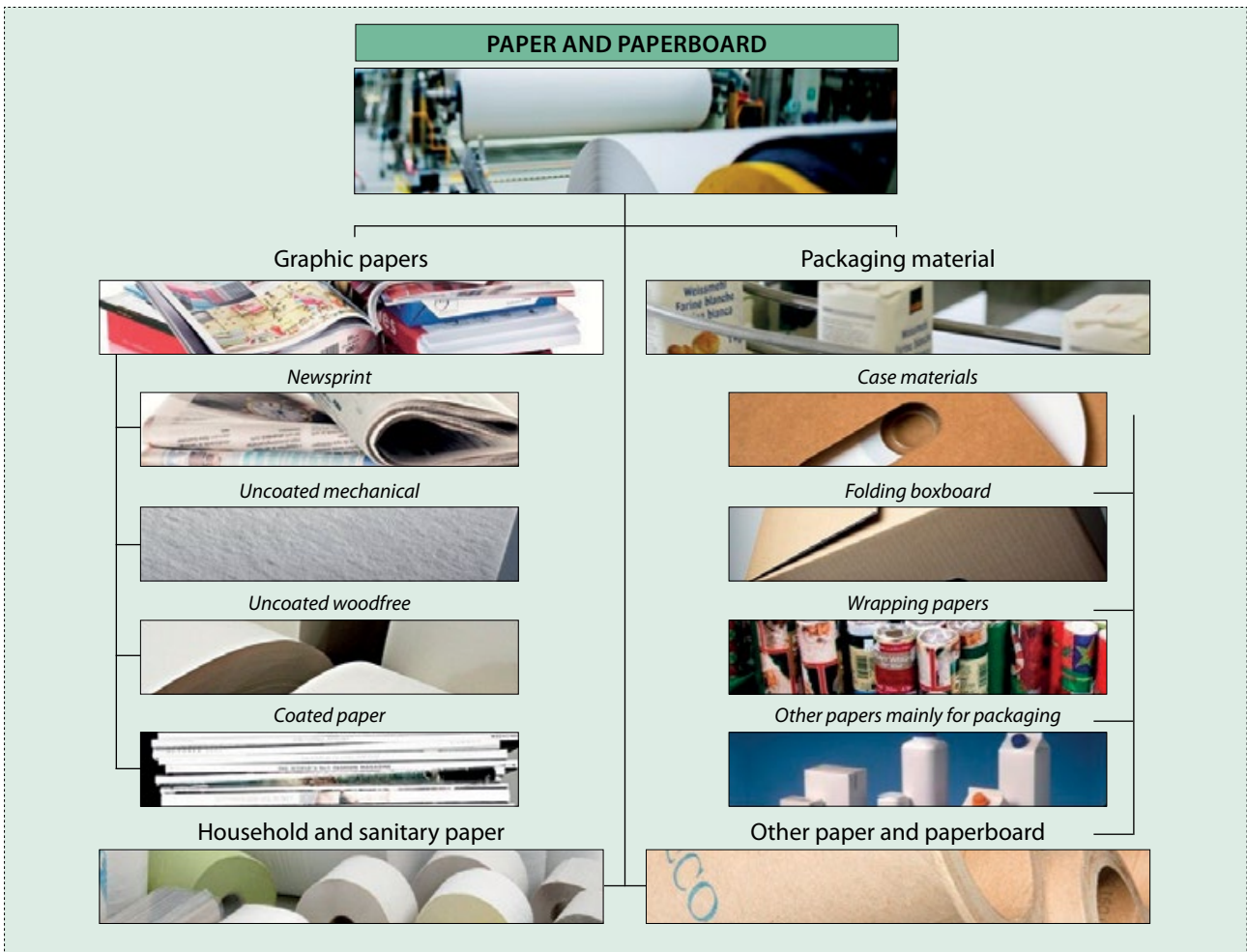
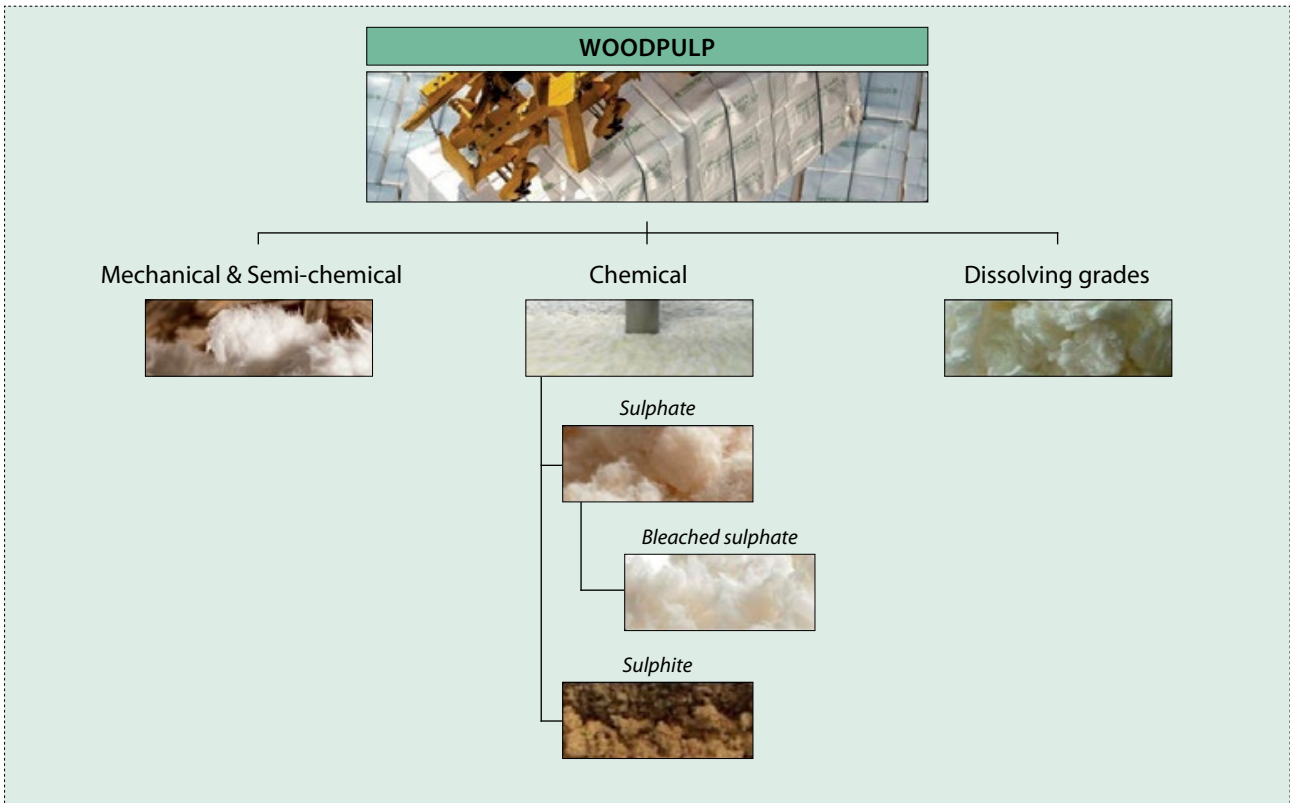
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COMPONENTS OF WOOD PRODUCTS GROUPS

(Based on Joint Forest Sector Questionnaire nomenclature)

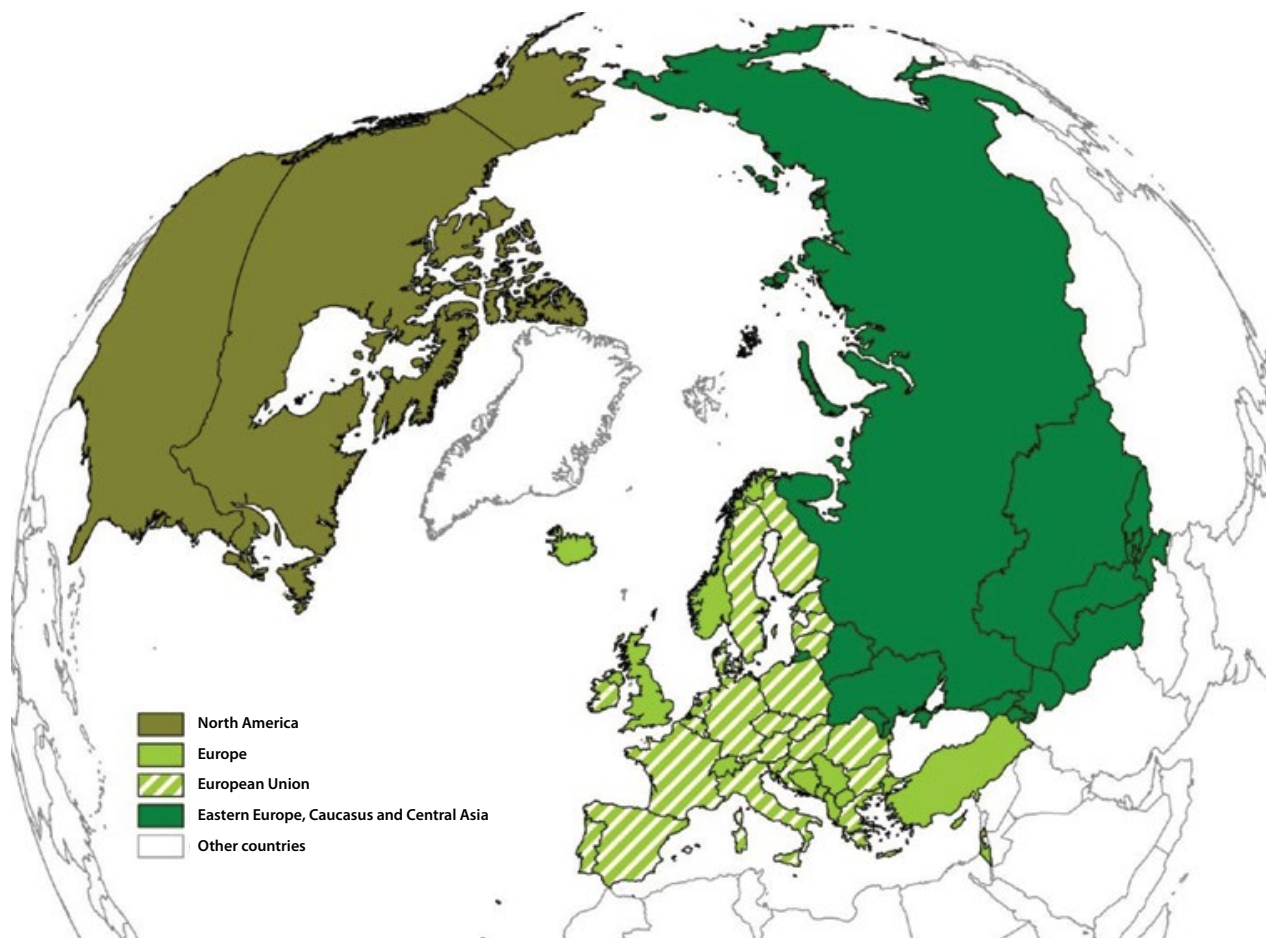
The diagrams below show the important breakdowns of the major groups of primary forest products. In addition, some sub-items (all roundwood products; sawnwood; and veneer and plywood) are further divided into softwood and hardwood. Items that do not fit into listed aggregates are not shown. These are wood charcoal; wood chips and particles; wood residues; recovered wood; pellets and agglomerates; sawnwood; veneer; other pulp; and recovered paper.





Sources for images in these diagrams are databanks of Metsä Group (2012), Raunio Saha (2012), Stora Enso (2012) and UPM (2012).

COUNTRIES IN THE UNECE REGION AND ITS SUBREGIONS



Eastern Europe, Caucasus and Central Asia

Armenia
Azerbaijan
Belarus
Georgia
Kazakhstan
Kyrgyzstan
Republic of Moldova
Russian Federation
Tajikistan
Turkmenistan
Ukraine
Uzbekistan

North America

Canada
United States of America

European Union

Austria
Belgium
Bulgaria
Croatia
Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden

Europe other countries

Albania
Andorra
Bosnia and Herzegovina
Iceland
Israel
Liechtenstein
Monaco
Montenegro
North Macedonia
Norway
San Marino
Serbia
Switzerland
Turkey
United Kingdom of Great Britain and Northern Ireland

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SOME FACTS ABOUT THE EUROPEAN FORESTRY COMMISSION

The European Forestry Commission (EFC), which was created in 1947, is one of six regional forestry commissions established by FAO to provide a policy and technical forum for countries to discuss and address forest issues on a regional basis.

The purpose of the EFC is to advise on the formulation of forest policies and to review and coordinate their implementation at the regional level; exchange information; advise on suitable practices and actions to address technical and economic problems (generally through special subsidiary bodies); and make appropriate recommendations in relation to the foregoing. The EFC meets every two years, and its official languages are English, French and Spanish.

The EFC has a number of associated subsidiary bodies, including the Working Party on the Management of Mountain Watersheds; the UNECE/FAO Working Party on Forest Statistics, Economics and Management; and seven UNECE/FAO Teams of Specialists. The Committee on Mediterranean Forestry Issues (*Silva Mediterranea*) informs the EFC.

FAO encourages the wide participation of government officials from forestry and other sectors as well as representatives of international, regional and subregional organizations that deal with forest-related issues in the region, including non-governmental organizations and the private sector. Accordingly, the EFC is open to all members and associate members whose territories are situated wholly or in part in the European Region or who are responsible for the international relations of any non-self-governing territory in that region. Membership comprises such eligible member nations as have notified the Director-General of their desire to be considered as members.

The EFC is one of the technical commissions serving the FAO Regional Office for Europe and Central Asia (REU), and the EFC Secretariat is based in Geneva. EFC work is regulated by its Rules of Procedures, which were adopted by the FAO Conference in 1961 and amended at the Eighteenth Session of the EFC in 1977.



SOME FACTS ABOUT THE COMMITTEE ON FORESTS AND THE FOREST INDUSTRY

The UNECE Committee on Forests and the Forest Industry (COFFI) is a principal subsidiary body of the UNECE based in Geneva. It constitutes a forum for cooperation and consultation between member countries on forestry, the forest industry and forest product matters. All countries of Europe and the EECCA, as well as the United States, Canada and Israel, are members of the UNECE and participate in its work.

The UNECE Committee on Forests and the Forest Industry shall, within the context of sustainable development, provide member countries with the information and services needed for policymaking and decision-making with regard to their forest and forest industry sectors, including the trade and use of forest products and, where appropriate, it will formulate recommendations addressed to member governments and interested organizations. To this end, it shall:

1. with the active participation of member countries, undertake short-, medium- and long-term analyses of developments in, and having an impact on, the sector, including those developments offering possibilities for facilitating international trade and for enhancing the protection of the environment;
2. in support of these analyses, collect, store and disseminate statistics relating to the sector, and carry out activities to improve their quality and comparability;
3. provide a framework for cooperation, for example by organizing seminars, workshops and ad hoc meetings and setting up time-limited ad hoc groups, for the exchange of economic, environmental and technical information between governments and other institutions of member countries required for the development and implementation of policies leading to the sustainable development of the sector and the protection of the environment in their respective countries;
4. carry out tasks identified by the UNECE or the Committee on Forests and the Forest Industry as being of priority, including the facilitation of subregional cooperation and activities in support of the economies in transition of central and eastern Europe and of the countries of the region that are developing from an economic perspective; and
5. keep under review its structure and priorities and cooperate with other international and intergovernmental organizations active in the sector, particularly FAO and its European Forestry Commission and the International Labour Organization, in order to ensure complementarity and avoid duplication, thereby optimizing the use of resources.

More information about the work of the EFC and COFFI may be obtained by contacting:

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Food and Agriculture Organization of the United Nations
Palais des Nations
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Forest Products Annual Market Review 2020-2021

The *Forest Products Annual Market Review 2020-2021* provides a comprehensive analysis of markets in the UNECE region and reports on the main market influences beyond the region. It covers products from the forest to the end user and from roundwood and primary processed products to value-added, housing and wood energy. Statistics-based chapters analyse the markets for wood raw materials, sawnwood, wood-based panels, paper, paperboard and woodpulp. Underlying the analysis is a comprehensive collection of data. The *Review* highlights the role of sustainable forest products in international markets, discusses policies concerning forests and forest products, assesses the main trends and drivers, and analyses the effects of the current economic situation on forest product markets.

The *Review* forms the basis of the Market Discussions held at annual sessions of the UNECE Committee on Forests and the Forest Industry, and it provides valuable objective information for other policymakers, researchers and investors.

Further information on forest product markets, as well as on the UNECE Committee on Forests and the Forest Industry and the FAO European Forestry Commission, is available at: www.unece.org/forests.

The *Review* has an extensive statistical annex, which is available at: www.unece.org/forests/fpamr2021-annex

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