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UNECE

Forest Products
Annual Market Review 2018-2019

UNITED NATIONS

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ABSTRACT

The *Forest Products Annual Market Review 2018-2019* provides a comprehensive analysis of markets in the UNECE region and reports on the main market influences outside the UNECE region. It covers the range of products from the forest to the end user - from roundwood and primary processed products to value-added, housing and wood energy. Statistics-based chapters analyse the markets for wood raw materials, sawn softwood, sawn hardwood, 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. Policies concerning forests and forest products are discussed, as well as the main drivers and trends. The *Review* also analyses the effects of the current economic situation on forest products markets.

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FOREWORD

Achieving the UN Sustainable Development Goals by 2030 will, to a great degree, depend on implementing a "circular economy". In the forest sector, this relates to how we manage forests and use forest products. The *Forest Products Annual Market Review* covers recent trends, policies and market intelligence on forest products along with production, consumption and trade statistics for the UNECE region; all of which are critical to the role of forests in creating a more circular economy.

The circular economy, in turn, is a cornerstone in efforts to address climate change and is built upon key aims: design out waste and pollution; keep products and materials in use; use renewable resources; and regenerate and sustainably manage natural systems.

The forest sector can address several sources of greenhouse gas (GHG) emissions:

Electricity and heat production, including onsite energy for heating and cooking, generates about 31 percent of total net anthropogenic GHG emissions, and this figure grows to 41 percent if the energy used to refine and extract fuels is accounted for. Wood is a cost effective and potentially renewable source of energy, which can supply a big share of global heat if the natural resource base is sustainably managed, including the environmental and social dimensions. Saved energy from the use of wood is also potentially significant because of wood's natural insulating qualities when used as a construction material, in comparison to the thermal conductivity of other products such as concrete and steel. Moreover, there are potentially less waste products from wood, given that a high percentage can be recycled, reused, and at the end of its useful life, burned.

The second largest source of GHG is linked to agriculture, forestry and land use change (23 percent), largely due to deforestation driven by livestock and crop production. Making forests more valuable through developing markets and income opportunities based on sustainably sourced forest products would address this issue. The third most significant source for emissions is industry (18 percent). Overall, the carbon footprint of the forest industry is quite small, with much of the energy used in the forest industry generated onsite by renewable wood residues.

The forest industry is a prime example of circular economy, including possible cascading uses (using wood transformation by-products for other successive wood products and burning wood at the very end, after several uses of the material). Wood is natural and renewable, with all the parts of a tree useable as products and energy, or nutrients for the soil. The forest industry can potentially provide much of its own renewable energy; forest products are long living and store carbon when used in structures; and the shorter living products such as paper and packaging are recyclable. Long lived products can be reused as is; or reconfigured to new products; and at the end of their useful life be used as energy. Products like plastics and many types of synthetic textiles, which are part of the non-sustainable linear economy, can be replaced with products made from sustainable wood. The forest sector, including forest products is a cornerstone of building a circular economy and as such are important to monitor and analyse.

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Many of the people involved in producing the *Forest Products Annual Market Review* volunteer their time and expertise; others are supported by companies, universities, industry associations and a variety of other organizations. Without the help of all these people and institutions, it would not be possible to produce this annual publication. This edition could not have been published without the financial support of the government of Finland.

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We acknowledge the authors who wrote the chapters and, in so doing, shared their expertise and knowledge. They not only provided much of the market intelligence in their own chapters, they also assisted with data and information used elsewhere in the publication, including the summarized information in the Overview. You can find contact details and affiliations of all authors in the annex.

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The manuscript was completed on 16 August 2019.

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Statistical correspondents from the previous page supplied the data and statistics for this publication, which can be found in the FAOSTAT database. The secretariat is grateful that correspondents provided data for 2018 or, in the absence of formal statistics, their best estimates. In those cases where there is no official source for information, data was estimated by using: author estimates, information from trade journals and research papers, data from the Committee on Forests and the Forest Sector Timber Forecast Questionnaire, or 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 often referred to as "consumption". Consumption is a sum of a country's (or subregion's) production, imports and exports.

For ease of reading, the publication mostly provides value data in US dollars (indicated by the sign "$"). Unless specific for a given time period, the applied exchange rate for the euro in 2018 is €0.8472 = $1 and for the Russian rouble is RUB 62.67 = $1. Both these exchange rates are based on the annual average rate provided by UNECE (http://w3.unece.org/PXWeb/en).

"Net trade" is the balance of exports and imports and is positive for net exports (i.e. when exports exceed imports) and negative for net imports (i.e. when imports exceed exports). Trade data for the 28 European Union (EU) countries include intra-EU trade, which is often estimated by the countries. Export data usually include re-exports. Subregional trade aggregates in tables include trade occurring between countries of the subregion.

Forecasts for 2019 are based on the forecast rate of change for 2018 to 2019 made at the November 2018 meeting of the Committee on Forest and the Forest Industries, which was then applied to the 2018 data supplied for the *Review*.

For a breakdown of the region into its subregions, please see the map in the annex. References to EU28 refer collectively to the 28 country members of the EU. The term Commonwealth of Independent States (CIS) 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 (* not member States of the CIS). It is used solely for the reader's convenience.

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 "ton" or "tonnes" in this text represent the metric unit of 1,000 kilograms (kg) unless otherwise indicated.

A billion refers to a thousand million (10^9).

Please note that all volumes of US and Canadian sawn softwood production and trade are given in solid m^3, converted from nominal m^3.

The use of the term "oven-dry" in this text is used in relation to the weight of a product in a completely dry state: e.g. an oven-dry tonne of wood fibre means 1,000 kg of wood fibre containing no moisture at all.

ACRONYMS, ABBREVIATIONS AND SYMBOLS

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

…	not available
$	US dollar unless otherwise specified
€	euro
ACS	American Community Survey
APA	The Engineered Wood Association
AWC	American Wood Council
BIS	Bank of International Settlements
BJC	builders' joinery and carpentry
BMO	Bank of Montreal
C&F	cost and freight
C$	Canadian dollar
CEPI	Confederation of European Paper Industries
CETA	Comprehensive Economic and Trade Agreement
CHKV	China, Hong Kong SAR, Viet Nam
CIF	cost, insurance and freight
CIS	Commonwealth of Independent States
CLT	cross-laminated timber
CO_2	carbon dioxide
CoC	chain-of-custody
CSIL	Centre for Industrial Studies
DACH	Germany, Austria and Switzerland
DOE	Department of Energy
DOC	Department of Commerce
ECB	European Central Bank
ECCC	Environment and Climate Change Canada
ECSO	European Construction Sector Observatory
EEA	European Economic Area
EFTA	European Free Trade Association
EIA	Energy Information Administration
EPF	European Panel Federation
EU	European Union
EUTR	European Union Timber Regulation
EWP	engineered wood products
FLEGT	the Forest Law Enforcement, Governance and Trade
FOB	free on board
FSC	Forest Stewardship Council
GDP	gross domestic product
GFC	global financial crisis
GHG	greenhouse gas
GSPI	Global Sawlog Price Index
HA	hectare
HDF	High-density fibreboard
HFPI	Hardwood Fiber Price Index
HS	Harmonized System
ICC	International Code Council
IMF	International Monetary Fund
INSEE	National Institute of Statistics and Economic Studies
ISO	International Organization for Standardization
KD	Kiln Dried
ITTO	International Tropical Timber Organization
LIRA	Leading Indicator of Remodelling Activity
LSL	laminated strand lumber
LVL	laminated veneer lumber
M.T.	metric ton or tonne
M^2	square metre
M^3	cubic metre
MBA	Mortgage Bankers Association
MDF	medium-density fibreboard
MENA	Middle East North Africa
MW	megawatt
MWE	megawatt electric
MWTH	megawatt thermal
NRA	National Risk Assessment
NECP	National Energy Climate Plan

ODNR	Ohio Department of Natural Resources
OSB	oriented strand board
OSL	oriented strand lumber
OSUE	Ohio State University Extension
PEFC	Programme for the Endorsement of Forest Certification
PFPI	Pellet Feedstock Price Index
PJ	petajoule
PSL	parallel stand lumber
RBC	Royal Bank of Canada
RED	Renewable Energy Directive
SBP	Sustainable biomass program
SFI	Sustainable Forestry Initiative
SFPI	Softwood Fiber Price Index
SILK	Timber Legality Information System
SLB	Softwood Lumber Board
SPF	spruces, pines and firs
UK	United Kingdom of Great Britain and Northern Ireland
UKTR	United Kingdom Timber Regulation
UNFCCC	United Nations Framework convention on climate change
US	United States of America
USDA	United States Department of Agriculture
USITC	United States International Trade Commission
VPA	Voluntary Partnership Agreements
VOC	volatile organic compound
WRQ	Wood Resource Quarterly
WTO	World Trade Organization

Chapter 1

OVERVIEW OF FOREST PRODUCTS MARKETS AND POLICIES

Author of economic overview: José Palacín

Highlights

Economic growth accelerated in the US in 2018, supported by fiscal stimulus and a robust labour market. Economic activity moderated in the euro area as export growth weakened throughout the year; the most recent EU member states did relatively well, with output accelerating in a number of those countries. The recovery in the CIS gained strength, driven by the Russian Federation.

The area of certified forest worldwide contracted in 2018. The FSC and the PEFC reported a combined total of 510 million ha of certified forest, as of mid-2018; after accounting for double-certification, however, the total net certified forest area globally was 424 million ha, a decrease of 7 million ha compared with the previous reporting period.

The total consumption of roundwood – comprising logs for industrial uses and fuel – in the UNECE region was estimated at 1.4 billion m^3 in 2018, an increase of almost 5% compared with 2017.

The three UNECE subregions recorded mixed results in the consumption of sawn softwood in 2018, with increases of 2.6% in Europe and 1.0% in North America but a decline of 0.5% in the CIS. Sawn softwood production increased in all three subregions.

Sawn hardwood consumption and production continue to stagnate in the UNECE region, despite relatively good economic conditions in most of the region in 2018.

Overall, panel production was up by 1.1% in the UNECE region in 2018, and apparent consumption grew by 1.3%. Growth in the wood-based panels sector is projected to continue into 2019, with production expected to increase by 2.1% and apparent consumption by 0.5%.

The production and apparent consumption of graphic papers continued to decline in virtually every market in 2018 as end users reduced their advertising budgets for print media.

The apparent consumption of paper and paperboard fell slightly in the UNECE region in 2018, with declines in Europe and North America of just over 1% and an increase in the CIS of 2.6%.

Wood energy consumption changed little overall in the UNECE region in 2018. The production of wood pellets increased in North America and the CIS, mainly to supply Europe as well as the Republic of Korea and Japan.

Asia and the Pacific accounts for about 54% of global furniture consumption and the UNECE region for 41%. Africa, the Middle East and Latin America together are responsible for only 5% of global furniture consumption.

The Europe subregion leads the world in CLT production, with about 60% of the global total (currently about 700,000 m^3). Ten CLT plants were in operation in North America in 2018, with two more under construction. The first CLT plant in the Russian Federation is under construction.

1.1 Introduction to the publication

The 2019 edition of the UNECE/FAO *Forest Products Annual Market Review* provides a comprehensive review of market developments in the UNECE region in 2018 and the first half of 2019 and of the policies driving those developments. The UNECE region has three subregions: Europe, the Commonwealth of Independent States (CIS) and North America. It stretches from Canada and the United States of America (US) in the west through Europe to the Russian Federation and the Caucasus and Central Asian republics in the east. It encompasses about 1.7 billion ha of forest, which is almost all boreal and temperate forests in the Northern Hemisphere and just under half the world's total forest area.

The *Review* provides background for the Market Discussion, to be held during the session of the UNECE Committee on Forests and the Forest Industry, which takes place on 4-7 November 2019 in Geneva, Switzerland.

This chapter acts as an executive summary, providing an overview of the ensuing nine chapters. Section 1.2, which follows this section, describes the broad macroeconomic situation in the UNECE region. Citation and refences are omitted in this overview chapter but can be found in the regular chapters (chapters 2-10).

Chapters 2-10 of the *Review* outline the impacts of the economic situation on particular sectors and geographical regions. Chapter 2 provides background on the policies and market tools influencing the forest products sector, including those related to trade, energy and the environment (e.g. certified forest products, carbon policies and markets, and green buildings).

The *Review* presents and analyses the best available annual statistics for the period 2018-2019 from official national statistical correspondents and expert estimates.

The trends discussed in this publication comprise a mix of data from FAOSTAT (presented for the UNECE region as a whole and for each of the three subregions) and author-provided data, which may be derived from various sources, including the authors' own market intelligence. It may also include market information from outside the region, when these markets influence the UNECE region. A strong effort has been made to reconcile data and trends, but occasionally there are differences between sources. Additionally, there are times when authors may point to trends or data for different geographic aggregations than the standard subregions. References to "Europe", "the CIS" 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).

Electronic annexes[1] provide additional statistical information and are also available on the web.[2] These comprehensive statistics, which form the basis of many of the chapters, ensure data transparency in the *Review*.

1.2 Economic developments with implications for the forest sector

The pace of economic expansion in the UNECE region was more or less unchanged in 2018, although the dynamics of various groups of countries differed. Economic growth accelerated in the US, supported by fiscal stimulus and a robust labour market. Economic activity moderated in the euro area as export growth weakened throughout the year. The new EU member states fared relatively well in a more adverse external environment, and output continued to accelerate in a number of countries. A recovery gained strength in the CIS, driven by the improved performance of the Russian Federation. A more synchronized slowdown is emerging in 2019, however, amid trade tensions, which remain a major source of uncertainty and are dampening investment.

Labour market dynamics continued to improve throughout the region in 2018. In the US, the sustained economic expansion was accompanied by rising wages, dragging additional workers into the labour force. Labour markets became tighter in the euro area, leading to accelerated wage growth that, however, has not yet translated into significant price pressures. Employment is at record levels, with particularly strong increases in the construction sector. Increases in the number of hours worked have trailed behind the growth of employment, however, reflecting a compositional shift towards a higher share of part-time employment. There are large disparities in unemployment rates between countries. In some of the more recent EU member countries, labour shortages have appeared in particular sectors despite an improved migratory balance. In the CIS, wage growth accelerated amid falling unemployment.

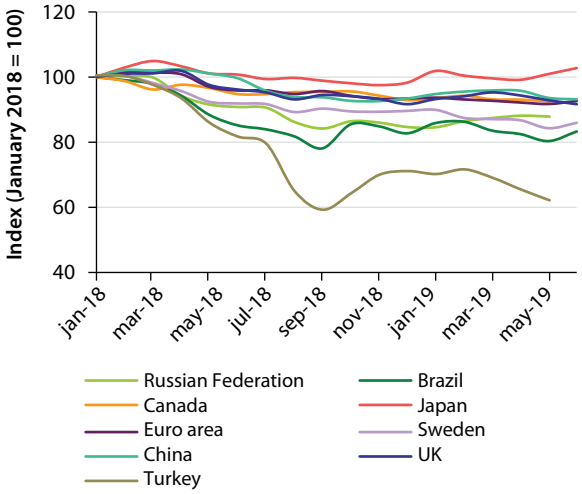
Supported by growing incomes, housing prices continued to climb throughout the region in 2018. In the US, however, the growth deceleration that started in 2018 extended into early 2019. Construction activity picked up sharply over 2018 but performance deteriorated in the last months of the year, and the contraction of residential investment persisted into early 2019. The situation in the EU differed by country but, overall, housing prices continued to climb at a steady pace. Increasing housing demand has been supported by growing

1 www.unece.org/forests/fpamr2019-annex

2 http://www.fao.org/faostat/en/#data/FO

GRAPH 1.2.1

Major currencies used to trade forest products indexed against the US dollar, January 2018-June 2019



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: International Monetary Fund (IMF Data), 2019. Available at: http://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42

incomes and the availability of finance. Although house prices are above pre-global financial crisis levels in the euro area, residential investment is significantly lower. The growth of construction output decelerated, driven by the slowdown in building, which, in contrast, increased at double-digit rates in some new EU member countries. Survey data point to a softening of activity in early 2019. Labour shortages are increasingly mentioned as a factor limiting construction production, particularly in the large euro-area countries. Despite some deceleration, the ongoing recovery of housing markets is expected to continue, and this will support overall economic activity. In some CIS countries, the rapid growth of mortgage financing has sparked concerns among monetary authorities. Housing prices have picked up in the Russian Federation after years of decline. Although construction activity recovered in 2018, the number of new residential buildings fell.

Despite the acceleration of economic growth and increasingly tight labour markets, inflationary pressures remained muted in the US. Monetary policy normalization continued in 2018, with four hikes in interest rate. In early 2019, however, monetary authorities clearly signalled the end of tightening, and there are growing market expectations that a cut could take place this year. The toll on the dollar of this monetary policy reversal has been relatively contained (graph 1.2.1). The nominal trade-weighted dollar exchange rate rose through most of 2018, with limited weakening in mid-2019. Monetary policy was highly accommodative in the euro area. The European Central Bank ended its quantitative easing programme in December 2018 but indicated that a significant monetary stimulus was still required for price stability over the medium term. Amid increased concerns about a deteriorating economic outlook and inflation well below target, further loosening is anticipated. In the CIS, monetary authorities are expected to continue to cut rates, which remain relatively high in some countries, in a context of moderate growth prospects.

In the US, fiscal expansion contributed to the acceleration of economic activity in a context of weakening global growth, but the effects of this looser fiscal policy are likely to fade. Rising investment in 2018 mainly reflected an increase in demand due to additional spending, and the impact of tax cuts appears limited. Fiscal austerity has come to an end in the euro area and the expansionary stance in 2019 is helping to offset external headwinds. Rather than a concerted effort, fiscal loosening reflects a variety of national initiatives, and fiscal space differs widely across countries. Low financing costs have made debt more affordable and slowed the growth of public debt-to-gross national product ratios, but high debt is restricting fiscal expansion in those economies with higher unemployment rates. Conservative fiscal policies have continued in most CIS countries, with energy-exporting economies rebuilding fiscal buffers and external constraints and debt growth pushing others into fiscal consolidation.

The pace of economic activity is expected to slow in 2019, with waning momentum for growth throughout the region. The demand boost from the US fiscal stimulus is declining and the cyclical recovery is also losing steam in a number of economies with increasingly tight labour markets. In a context of lingering trade tensions and decelerating cross-border exchanges, domestic factors will play a greater role in driving future expansion. The projected economic slowdown has exacerbated concerns about the accumulation of corporate debt and the deterioration of credit quality. A disorderly withdrawal of the UK from the EU would generate negative spillovers for other countries and damage confidence. Many middle-income countries in the region are highly dependent on foreign financing and remain vulnerable to a deterioration in external conditions. In the CIS, weaker commodity prices would weigh negatively on growth. The balance of risks in the UNECE region remains firmly tilted to the downside, buffeted by continued policy uncertainty.

1.3 Policy and regulatory developments affecting the forest products sector

The leadership of various levels of government is increasingly apparent in responsible-sourcing strategies, carbon programmes, renewable energy development and green building standards. Developments in these areas, as well as related trade actions, are addressed in Chapter 2. After almost one year of the Comprehensive Economic and Trade Agreement (CETA), which came into force provisionally in September 2017, exports from the EU to Canada had risen 7%, including a 10% increase in furniture exports. It was estimated that, of the €3.78 billion of tropical wood products imported into the EU in 2017, 21% were Forest Law Enforcement, Governance and Trade (FLEGT)-licensed products from Indonesia and 54% were from the other 14 countries engaged on FLEGT with the EU. An assessment of Ghana's timber legality assurance system has been initiated which could lead to Ghana becoming the first country in Africa to issue FLEGT licences.

The area of certified forests worldwide contracted in 2018. The Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) reported a combined total of 510 million ha of certified forest, as of mid-2018; after accounting for double-certification (i.e. forest areas certified by both certification bodies), however, the total net certified forest area globally was 424 million ha, a decrease of 7 million ha compared with the previous reporting period; the area of double-certified forest was 4 million ha less than was reported in 2016. Much of the recent decrease in certified forest area can be attributed to a decline in Australia.

The EU's revised Renewable Energy Directive 2018/2001/EU entered into force in December 2018 as part of the Clean Energy for all Europeans package, the aims of which are to ensure the EU remains a global leader in renewables and, more broadly, to help the EU meet its emissions reduction commitments under the Paris Agreement on climate change. The Sustainable Biomass Program (SBP) reported the production and sale of more than 9 million tonnes of SBP-certified biomass in 2018, an increase of 80% over 2017 and now accounting for the majority (65%) of EU28 pellet consumption. Five more countries are now active in the SBP, including Brazil.

Green building and the use of wood in the built environment continue to expand. The Government of the Russian Federation has approved incentives for the purchase of wooden houses. The 2018 provision will subsidize mortgage rates to individuals purchasing prefabricated wooden houses from manufacturers. The International Code Council (ICC) has approved 14 changes to the tall mass timber code following a multiyear effort by the ICC Ad Hoc Committee on Tall Wood Buildings.

As leadership roles continue to evolve in the forest sector, it is evident that diverse private and public partnerships are vital for supporting innovations that aid the growth and success of forest product markets.

1.4 Summary of regional and subregional markets

General conditions in forest products markets in the UNECE region were mixed in 2018, with consumption increasing in sawnwood (+1.5%), wood-based panels (+1.4%) and industrial roundwood (+5.8%). In contrast, the consumption of paper and paperboard continued to decline in Europe and North America in 2018, although there was a year-on-year increase in the CIS of 2.6%. Overall, the consumption of paper and paperboard declined in the UNECE region by 1.0% in 2018 (table 1.4.1).

1.4.1 Wood raw materials

The total consumption of roundwood – comprising logs for industrial uses and fuel – in the UNECE region was estimated at 1.4 billion m^3 in 2018, an increase of almost 5% compared with 2017. The apparent consumption of roundwood for industrial purposes trended upward in the UNECE region in the five years to 2018, to 1.19 billion m^3, 5.1% higher than in 2014. Woodfuel consumption increased by 3.0 million m^3 in 2017, to 221.5 million m^3.

Of the total volume of roundwood harvested in the UNECE region in 2018, about 18% was used for fuel (257.1 million m^3), an increase of 9.2 million m^3 (+3.7%) over 2017. Europe accounted for 54% of total woodfuel consumption in the UNECE region in 2017.

China was (again) the number-one importer of industrial softwood roundwood globally in 2018 (importing 40.1 million m^3), followed by Austria (9.1 million m^3), Germany (8.2 million m^3), Sweden (6.6 million m^3) and the Republic of Korea (3.9 million m^3). The major log trade flows in 2018 were in the Pacific Rim, with shipments to China from New Zealand, the Russian Federation, the US and Australia accounting for four of the top five of these worldwide. In Europe, the major trade flows were from Czechia to Austria, from Poland to Germany and from Norway to Sweden.

It is estimated that storms and beetles have damaged 110 million-140 million m^3 of timber in central Europe in the last two years, mainly in Austria, Czechia, France, Germany, Italy, Slovakia and Switzerland. Northern Europe is also seeing increased beetle activity.

Chinese importers have gradually shifted their historical preference for logs away from the Russian Federation towards New Zealand and instead are importing softwood lumber from the Russian Federation.

North America's log exports declined by 11.7% in 2018, to 18.4 million m^3. China retaliated against US tariffs by imposing tariffs on some US forest products in the second half of 2018. US log shipments to China declined in the second half of the year and the fall continued into early 2019 (the first quarter of 2019 was down by almost 30% over the same quarter in 2018). Canada's log exports to China fell by 19% in 2018.

Sawlog price movements were mixed worldwide in 2018, although prices were mostly higher than in 2017. The biggest price declines between the first quarter of 2018 and the first quarter of 2019 were in Europe, especially in the central and

TABLE 1.4.1

Apparent consumption of industrial roundwood, sawnwood, wood-based panels, and paper and paperboard, UNECE region, 2014-2018

	Thousand	*2014*	*2015*	*2016*	*2017*	*2018*	*Change (volume) 2017-2018*	*Change(%) 2017-2018*	*Change (%) 2014-2018*
INDUSTRIAL ROUNDWOOD									
Europe	m^3	397,156	401,593	410,270	407,580	432,628	25,048	6.1	8.9
CIS	m^3	181,822	185,471	194,721	198,418	226,389	27,972	14.1	24.5
North America	m^3	490,150	494,222	498,494	494,953	506,154	11,201	2.3	3.3
UNECE region	m^3	1,069,128	1,081,286	1,103,486	1,100,951	1,165,171	64,221	5.8	9.0
SAWNWOOD									
Europe	m^3	100,976	103,760	107,552	110,698	113,013	2,315	2.1	11.9
CIS	m^3	19,247	17,219	16,689	18,041	18,187	146	0.8	-5.5
North America	m^3	106,274	112,603	117,570	118,392	119,530	1,138	1.0	12.5
UNECE region	m^3	226,497	233,582	241,811	247,132	250,730	3,599	1.5	10.7
WOOD-BASED PANELS									
Europe	m^3	66,931	68,659	71,916	74,299	75,670	1,371	1.8	13.1
CIS	m^3	17,190	17,164	16,836	18,485	20,265	1,780	9.6	17.9
North America	m^3	50,392	52,623	53,601	56,603	55,509	-1,094	-1.9	10.2
UNECE region	m^3	134,513	138,446	142,353	149,388	151,445	2,057	1.4	12.6
PAPER AND PAPERBOARD									
Europe	m.t.	89,361	88,365	88,430	89,565	88,465	-1,100	-1.2	-1.0
CIS	m.t.	9,397	9,106	9,561	9,520	9,772	252	2.6	4.0
North America	m.t.	76,053	75,651	75,602	75,037	74,205	-832	-1.1	-2.4
UNECE region	m.t.	174,811	173,123	173,593	174,122	172,442	-1,680	-1.0	-1.4

Note: Sawnwood does not include sleepers through 2016.

Source: FAOSTAT, 2019. Available at: http:// http://www.fao.org/faostat/en/#data/FO

eastern parts. In North America, sawlog prices fell in the western US and eastern Canada, increased slightly in the US South, and jumped by 16% in Interior British Columbia.

1.4.2 Sawn softwood

The three UNECE subregions recorded mixed results in the consumption of sawn softwood in 2018, with modest increases in Europe and North America and a small decline in the CIS. The production of sawn softwood increased in all three subregions, however. The recovery continued in North America for the ninth consecutive year, with sawn softwood consumption increasing by 1.0%, although it slowed in the second half of 2018 and into 2019. Consumption increased by 2.6% in Europe and decreased by 0.5% in the CIS subregion.

Sawn softwood production increased by 1.7% in Europe in 2018, to 112.5 million m^3. The increase was driven more by European demand rather by overseas exports.

Production increases in central Europe were well above European averages, due partly to timber salvage programmes there to harvest trees damaged by storms and beetles. Output from Nordic mills was more moderate.

Prices increased for European sawn softwood in the first half of 2018 and dropped off in the second half; nevertheless, prices in 2018 were generally better than in 2017 and there was further improvement in early 2019.

Germany, Italy and the UK are the largest importers of sawn softwood in the subregion, accounting for 40% of the total volume. Imports to the UK and Italy declined by 11% and 4.6%, respectively, in 2018 but increased by 6.0% in Germany.

The volume of European sawn softwood exports was steady (+0.2%) in 2018, at 51.9 million m^3. There was an increase in intraregional exports within Europe, but demand declined in the key overseas markets of China and Japan. Combined exports to the Middle East and North Africa increased by 3.6% in 2018 after a sharp drop in 2017.

The CIS subregion produced almost 48 million m^3 of sawn softwood in 2018, up by 7.1% over 2017.

Domestic demand for sawn softwood in the Russian Federation is expected to increase dramatically to 24.7 million m^3 in 2030. Export markets for sawn softwoods from the Russian Federation are expected to grow from 29.8 million m^3 in 2018 to more than 37 million m^3 in 2030, with China the main destination.

Sawn softwood exports from the CIS amounted to 36.3 million m^3 in 2018 (up by 10% from 2017), about 86% of which was provided by the Russian Federation.

Demand in North American sawn softwood markets started to slow in the second half of 2018 and barely grew in the first half of 2019, mainly a function of slowing US housing starts. A portion of this was weather-related, with exceptionally cold or wet weather the norm since the fourth quarter of 2018.

US sawn softwood output was 59.5 million m^3 in 2018, up by 3.2% over 2017. Production gains were highest in the US West (+4.3%), followed by the US South and the Midwest/Northeast regions (both +2.4%). The ongoing depressed prices for standing timber in the US South are a result of excess and unused growing stock. The US South accounts for more than 55% of US production and continues to achieve the highest earnings in North America.

Canadian sawn softwood production was 45.2 million m^3 in 2018, down by 2.3% from 2017. All regions were hit with antidumping import duties (averaging 20.2%) on shipments to the US, and a slowdown in China's imports started a series of short-term mill curtailments in Canada that were still occurring in the second quarter of 2019.

The price of lumber in the US market (as measured by the Random Lengths framing lumber composite price index) peaked in early June 2018 at an all-time high of $582 per thousand board feet ($365 per m^3, net count). In the fourth quarter of 2018 and again in the second quarter of 2019, prices fell to well below cost in some regions, to as low as $300 per thousand board feet ($190 per m^3).

Canada continues to dominate US imports, with a 91% share in 2018 (25.5 million m^3). US imports from Europe soared to 2.0 million m^3, up from 1.3 million m^3 in 2017, but were lower by almost 10% in the first quarter of 2019 as prices fell. US exports were almost 20% down in the first quarter of 2019, due in part to the China-US trade dispute.

1.4.3 Sawn hardwood

Sawn hardwood consumption and production continue to stagnate in the UNECE region, despite relatively good economic conditions in most of the region in 2018.

Exports of sawn hardwood outstrip imports in all three UNECE subregions, with the region as a whole exporting about double the volume it imports.

The sawn hardwood industry faces a number of headwinds in the UNECE region, including an increasing consumer preference for inexpensive home furnishings and for cabinetry made from composite wood products and non-wood materials (away from traditional hardwood furniture).

European hardwood lumber production contracted by 2.0% in 2018, to 14.3 million m^3. In the CIS, sawn hardwood production increased by 10.5%, to 4.2 million m^3, and consumption also grew – by 16.0%, to 1.7 million m^3. North American sawn hardwood consumption increased by 210,000 m^3 (1.0%) in 2018, and production was relatively flat at 24.3 million m^3.

Asia continues to dominate the tropical sawnwood trade, with China and, to a lesser extent, Thailand and Viet Nam the major importers and Cameroon, Gabon, Malaysia and Thailand the major exporters. World imports of tropical sawnwood increased each year from a low in 2012 to reach 12.3 million m^3 in 2017; the volume declined in 2018, however, to 11.7 million m^3.

1.4.4 Wood-based panels

In general, 2018 was mixed for the wood-based panel sector in the UNECE region. Strong economic growth in North America and a mild winter in the CIS helped drive demand for wood-based panels in most end-use applications. Overall, panel production was up by 1.1% in the UNECE region and apparent consumption grew by 1.4%. Growth in the wood-based panels sector is projected to continue into 2019, with production expected to increase by 2.1% and apparent consumption by 0.5%.

Wood-based panel production was almost unchanged overall in Europe in 2018, at nearly 75 million m^3. There was a sizeable (4.8%) drop in plywood production, however, and the production of oriented strandboard (OSB) retracted slightly (by 0.4%). Production increased by 0.4% for fibreboard and by 0.3% for particle board.

The apparent consumption of wood-based panels increased by 9.6% in the CIS in 2018, to 20.3 million m^3. Production increased in the subregion by 9.7% in 2018, to 24.9 million m^3. The Russian Federation's production of wood-based panels was 17.3 million m^3, an increase of 11.2% over 2017.

North American demand for structural panels is expected to increase overall by 2.4% in 2019, comprising an increase of 6.2% for OSB and a decrease of 1.6% for plywood. Production capacity in the North American structural panel subsector increased by 2.1% in 2018, to 38.9 million m^3.

As in previous years, Indonesia and Malaysia were the dominant tropical plywood exporters in 2018, together supplying 73% of world exports.

1.4.5 Paper, paperboard and woodpulp

The global pulp, paper and paperboard industry continued its resurgence in early 2018, driven by a much tighter supply–demand balance for woodpulp and continued strong demand for packaging and sanitary and household products. Prices for virtually all products rose throughout the UNECE region in 2018. By the middle of the year, however, signs of stress had begun to appear in Asia (particularly China) and Europe as costs in the pulp and paper segments began to have a negative impact on apparent consumption.

The production and apparent consumption of graphic papers continued to decline in virtually every market in 2018 as end users reduced their advertising budgets for print media. The decline in the apparent consumption of graphic papers accelerated in early 2019 due to price increases.

The apparent consumption of paper and paperboard fell slightly in the UNECE region in 2018, with Europe and North America both declining by just over 1% and the CIS increasing by 2.6%.

Paper and paperboard production was flat in Europe, the CIS had an almost 4% increase, and North America experienced a slight drop. Woodpulp production and consumption followed similar trends, with a notable increase in the CIS but almost no change in Europe and North America.

A slowdown in China's economic performance in 2018 fuelled by rising costs and trade tensions created price weakness in that country, which spread through economies in the UNECE region in late 2018 and persisted to mid-2019.

1.4.6 Wood energy

Wood energy consumption changed little overall in the UNECE region in 2018. The trans-Atlantic trade of wood pellets reached new heights, however, and continues to dominate the international woodfuel trade. A combination of increased demand and slower-than-expected growth in operative production capacity led to higher prices for industrial wood pellets. Policy restrictions in developing Asian pellet markets slowed expectations of trans-Pacific North American pellet trade.

Primary energy production derived from solid biofuels in the EU28 was 3,986 PJ in 2017, up by 1.5% from 2016. Total primary energy production from solid biofuels in the EU28 grew by 30.7% in the ten years from 2007 to 2017. Imports comprised 9.4% of total primary energy production from solid biofuels in 2017.

European wood-pellet-based power-plant generation capacity exceeded 6,000 MW in 2018 and is forecast to surpass 8,000 MW by 2020. European wood pellet production

reached 18.0 million tonnes in 2018, while consumption was 25.4 million tonnes.

Argus Media reported that cost, insurance and freight spot prices for industrial wood pellets at Amsterdam, Rotterdam and Antwerp increased steadily in 2018 and through February 2019, with the highest annualized growth (above 50%, year-on-year) in January 2018.

European wood pellet imports continue to grow. The volume exceeded 17 million tonnes in 2018, up by 1.9 million tonnes (12%) compared with 2017. Nearly 60% (by weight) of imports into the EU28 from outside the EU were from the US, followed by Canada (17%) and the Russian Federation (13%).

Fuelwood is the primary form of wood energy consumed in the CIS, where many rural areas lack access to natural gas and other forms of affordable energy. In contrast to traditional fuelwood markets, the production and trade of wood pellets in the CIS are highly dynamic. Wood pellet production increased by 11.5% in the CIS in 2018 (to 2.7 million tonnes) and is expected to increase by another 3.8% in 2019. The largest portion of the production (as well as of the increase in production) was in the Russian Federation. Apparent consumption in the CIS was just 442,000 tonnes in 2018 (less than 20% of CIS production).

The Russian Federation produced 1.8 million tonnes of wood pellets in 2018, 300,000 tonnes of which (about 17%) was sold domestically. The total capacity of all Russian wood pellet plants increased slightly in 2018, to an estimated 3.6 million tonnes. Most of the pellet enterprises are in the northwest. Siberian wood pellet producers became more active between 2016 and 2018; today, Siberia is the Russian Federation's second-largest pellet-producing region. Production in the Far East has good potential to grow, due primarily to the attractiveness of exports to Asia. The average price (in roubles) increased by 40% in 2018, due to favourable export markets and a weakening rouble.

In Canada, the majority of wood energy generated in 2017 was from solid wood waste, including bark and wood-processing residues (12.1 million tonnes) and pulping liquor consumed in recovery boilers (17.9 million tonnes); this is expected to continue through 2018. In the US, residential use is projected to increase after 2018, but overall wood energy consumption is projected to decline by 3.3% between 2018 and 2020.

North American wood pellet production reached 10.5 million tonnes in 2018 and is expected to exceed 11 million tonnes in 2019. Additional growth is expected to come from new and restarting operations.

Outside the UNECE region, the Republic of Korea and Japan have become important in the global wood pellet market, importing 3.5 million tonnes and 1.1 million tonnes of wood pellets, respectively, in 2018.

1.4.7 Value-added wood products

The value of global furniture production was estimated at $470 billion, up by a staggering 7% ($20 billion) from 2017. Globally, the furniture trade has grown more quickly than furniture production in the last ten years. The migration of production to lower-cost regions has not ended, despite challenges such as increased risk and difficulties in sourcing materials.

The value of the world furniture trade has grown by 65% in the past ten years, from $96 billion in 2009 to $150 billion in 2018. This growth has benefited many emerging economies, led by Poland and Viet Nam. Asia and the Pacific accounts for about 54% of global furniture consumption and the UNECE region for 41%. Africa, the Middle East and Latin America together are responsible for only 5% of global furniture consumption.

US import markets for builders' joinery and carpentry (BJC) have grown for eight consecutive years. The source of these imports is shifting away from Asian exporters, and Latin American exporters are gaining market share. The three largest importers of BJC in Europe – France, Germany and the UK – obtained most (two-thirds) of their supplies from other European countries in 2017 and 2018. Similarly, Japan sourced about two-thirds of its BJC from Asia.

US profiled-wood imports were valued at $1.4 billion in 2018. For the first time in history, intra-subregional (i.e. Canadian) imports amounted to less than 10% of this value. High-quality South American pruned plantation pine has dominated US softwood moulding imports for decades but, today, China is the second-largest supplier to the US after Brazil. Profiled-wood markets in Europe, which are serviced mainly by other European producers, declined slightly in 2018.

Austria is the largest producer of glulam in Europe, at about 1.5 million m^3 per year. Italy was the single-largest importer of laminated timber products (glulam and cross-laminated timber) from Austria in 2018, at about 650,000 m^3, followed

by Germany (415,000 m^3) and Switzerland (140,000 m^3). Austria exported a total of 1.8 million m^3 of glulam and cross-laminated timber (CLT) in 2018, with Japan the only major importer outside Europe, at 122,000 m^3.

The overall production and consumption of North American glulam timber increased by 4.5% in 2018, to 467,700 m^3. The forecast is for production and consumption to remain steady in 2019 (well below the 2006 production peak of 750,000 m^3).

North American production and consumption of wooden I-beams fell by 2.8% in 2018, to 233.5 million linear meters. The production and consumption of laminated veneer lumber (LVL) also dropped – by 2.4%, to 2.2 million m^3.

The use of CLT (often categorized as a mass timber product) continues to grow, both inside the UNECE region and in countries outside the region with a tradition of wood construction, such as Australia and Japan. Proponents of the wood industry see great potential for this product in enabling the use of wood in the construction of large and tall structures that previously were the sole domain of steel and concrete.

The value of the global CLT market was estimated at $603 million in 2017, and it is projected to reach $1. 6 billion in 2024.

The European subregion leads the world in CLT production, providing about 60% of global production (currently about 700,000 m^3), and production in the subregion is forecast to continue increasing into the foreseeable future.

In late 2018, ten CLT manufacturing plants were in operation in North America (five in Canada and five in the US), with a combined annual production of about 400,000 m^3; two plants were under construction (both in Washington state), with a forecasted production of roughly 185,000 m^3; and three more plants had been announced.

The Segezha group has initiated construction of the first CLT plant in the Russian Federation. It is investing almost $48 million in the plant, which will have a capacity of 250,000 m^2 per year of CLT panels.

1.4.8 Housing

Housing prices have generally performed better than economies in most countries in the UNECE region. The Bank of International Settlements (BIS) reported that residential housing prices increased by 1.9% globally in 2018 and by 2.2% in the euro area, 2.0% in the US and 1.0% in the Russian Federation. Canadian house prices retreated, however, by 0.06%. According to BIS, real residential prices (adjusted for

inflation) are still substantially higher than in the wake of the global financial crisis.

Housing markets continued their growth in 2018, recording a fifth consecutive year of growth. New residential building remains a value driver in the Euroconstruct region,[3] accounting for nearly 25% (€342 billion) of the construction market value, and residential remodelling comprised 26% (€422 billion) of the volume. Combined, new residential and residential remodelling comprised 48% of construction value in 2018. New residential spending has increased by 26% (€72.3 billion) since 2015.

The total value of all construction in the Euroconstruct region (residential, non-residential and civil engineering) is projected to increase by 1.9% in 2019, year-on-year (to €1.64 trillion).

Completions of residential buildings in the Russian Federation in 2018 declined by 4.6% over the previous year. The estimate for total buildings (residential plus non-residential) put in place was down by 4.8% over 2017. The total floor area of new housing put in place in the Russian Federation is expected to increase substantially in 2019 over the average since 1996.

The US housing construction market grew moderately in 2018, but total new housing starts remained below the 1959-to-2007 average of 1.547 million total units and 1.102 million single-family units. Housing starts were estimated at 1.250 million in 2018, a 3.9% increase from 2017. Looking forward, the Mortgage Bankers Association projected that US housing starts will be 1.31 million units in 2019, 1.38 million units in 2020 and 1.41 million units in 2021.

The number of new Canadian housing starts is projected at 201,000 units in 2019 and 197,000 units in 2020. The slowdown is linked to the perception among financial institutions of rising risk in the Canadian housing market, the primary concerns being affordability, household debt, overbuilding in some provinces, and price acceleration. Nationwide mortgage guidelines, including what is known as the B-20 stress test, have helped stem price acceleration, but there is evidence that implementation of the B-20 has also hindered Canadian housing sales.

Housing affordability and availability are problems in Europe, the CIS and North America, with insufficient new buildings to meet population growth. To many observers, off-site manufacture might enable the building and sale of less-expensive housing units. Conceptually, modular houses can be built in shorter-time frames, and more houses could potentially be delivered to buyers. Thus, modular construction could offer reduced project completion times and material costs, greater quality control, the mitigation of labour shortages, improved safety, and year-round manufacturing.

3 The Euroconstruct region comprises 19 countries. The western subregion consists of Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK. The eastern subregion comprises Czechia, Hungary, Poland and Slovakia.

Chapter 2

POLICIES SHAPING FOREST PRODUCTS MARKETS

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Highlights

After almost one year of the Comprehensive Economic and Trade Agreement (CETA), which came into force provisionally in September 2017, exports from the EU to Canada had risen 7%, including a 10% increase in furniture exports.

In April 2019, the World Trade Organization (WTO) issued a report in agreement with the US Department of Commerce's differential pricing methodology and rejected Canada's complaint about antidumping and countervailing duties imposed by the US on imports of Canadian softwood lumber.

The UK has indicated an intention, after Brexit, to implement the UK Timber Regulation and a UK Forest Law Enforcement, Governance and Trade regulation (FLEGT) with the same requirements as the EU Timber Regulation and EU FLEGT regulations.

Of the €3.78 billion of tropical wood products imported into the EU in 2017, an estimated 21% comprised FLEGT-licensed products from Indonesia and 54% were from the other 14 countries engaged on FLEGT with the EU.

More than 39,000 licences for the export of wood products to the EU were reported to have been issued in the first twelve months after the launch of FLEGT-licensing in Indonesia. The Indonesian system (SILK) listed more than 2,700 certificate holders in April 2019.

An assessment of Ghana's timber legality assurance system has been initiated that could lead to Ghana becoming the first country in Africa to issue FLEGT licences.

The FSC and PEFC reported a combined certified area of 510 million ha, as of mid-2018. After accounting for double-certification, the total net certified forest area globally was 424 million ha, a decrease of 7 million ha compared with the previous reporting period. Much of the recent change can be attributed to a decline in certified forest area in Australia.

The amount of double-certified forest under the FSC and PEFC programmes increased from 71 million ha in mid-2017 to 86 million ha in mid-2018, primarily influenced by changes in Brazil, Canada, the Russian Federation and Sweden.

The Sustainable Biomass Program (SBP) reported the production and sale of more than 9 million tonnes of SBP-certified biomass in 2018, an increase of 80% over 2017 and representing 65% of EU28 pellet consumption. Five additional countries are now active in the SBP.

The International Code Council (ICC) has approved 14 changes to the tall mass timber code following a multiyear effort by the ICC Ad Hoc Committee on Tall Wood Buildings.

2.1 Introduction

The policies that shape forest product markets comprise a wide range of governmental and non-governmental actions and programmes. In past years, many of the innovations related to the green economy were led by the private sector and non-governmental organizations; recently, however, the role of government in formal policy has re-emerged and grown in influence. The leadership of various levels of government is increasingly clear in responsible-sourcing strategies, carbon programmes, renewable energy development and green building standards. This chapter addresses developments in these areas, as well as related trade actions. Although leadership roles evolve over time, it is evident that diverse private and public partnerships are vital for supporting innovations that aid the growth and success of forest product markets.

2.2 Trade-related

2.2.1 Transatlantic free trade

The Comprehensive Economic and Trade Agreement (CETA) between Canada and the EU entered into force provisionally in September 2017. After almost one year of operation, it was reported that exports from the EU to Canada had risen by 7%, including a 10% increase in furniture exports (European Commission, 2018a). National parliaments in the EU must approve the CETA before it can take full effect (European Commission, 2017). As of 13 July 2019, 28 EU countries had ratified the agreement (European Council, 2019).

The EU and the US issued a joint statement in July 2018 to "work together toward zero tariffs, zero non-tariff barriers, and zero subsidies on non-auto industrial goods" (European Commission, 2018b). In April 2019, EU member countries gave approval to start formal negotiations with the US on eliminating tariffs on industrial products, excluding agricultural products (European Commission, 2019a).

2.2.2 US and Canada forest trade and policy

The Softwood Lumber Agreement between Canada and the US 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 April 2018, at the request of Canada, the World Trade Organization (WTO) established panels to examine Canada's complaints regarding antidumping and countervailing duties imposed by the US on imports of Canadian softwood lumber (WTO, 2018). On 9 April 2019, the WTO issued the panel report in the case brought by Canada in "United States — Anti-Dumping Measures Applying Differential Pricing Methodology to Softwood Lumber from Canada" (DS534). The panel agreed with the US Department of Commerce (DOC) methodology using zeroing and rejected Canada's claims (WTO, 2019). Zeroing is a method for determining tariffs that does not account for the entirety of margins between the domestic price of a product and its import price. By "zeroing" negative margins, the resulting tariff calculations may be higher than when based on the weighted average of all transaction prices. The WTO has previously ruled against the use of the practice of zeroing (WTO, 2003). Canada has announced its intention to appeal the panel decision (Global Affairs Canada, 2019).

2.2.3 China-US trade and tariffs

A trade dispute between China and the US started in late August 2017 and has escalated since then in several steps. The US Trade Representative initiated an investigation pursuant to the Trade Act of 1974, as amended, to determine whether acts, policies and practices of the Government of China related to technology transfer, intellectual property and innovation are actionable under the Trade Act (US Trade Representative, 2017a). The findings of the investigation led to the implementation of three tranches of import tariffs. The first and second tranche amounted to $34 billion and $16 billion, respectively (US Trade Representative, 2018a and 2018b) and did not include wood products under Chapter 44 of the Harmonized Commodity Description and Coding Systems. The third tranche amounted to $ 200 billion; this round of tariffs took effect on 24 September 2018 and entailed 10% to 25% tariffs on Chinese wood product imports (US Trade Representative, 2018c and 2018d; Hancock Timber Research Group, 2018). In response, China imposed tariffs effective on the same day that included $60 billion worth of US imports. These tariffs targeted many agricultural products and ranged from 5% to 25% on all US wood product imports (Hancock Timber Research Group, 2018).

On 10 May 2019 the United States raised all tariffs on the $200 billion dollars of imports to a 25% rate (US Trade Representative, 2019). On 1 June 2019 China raised rates to 10% to 25% on previously tariffed $60 billion of US imports (CNBC, 2019). US forest product exports to China saw a drop from $1.7 billion to slightly over $1.0 billion in the year before and after the tariffs began. Sawn hardwood, one of the largest components of US wood product exports to China, accounted for a large portion of this drop (Melnick *et al.*, 2019; Hancock Timber Research Group, 2018).

2.2.4 Russian wood exports

The Russian Government introduced a quota on birch veneer log exports from 1 January 2019 to 30 June 2019 (not to exceed 567,000 m^3). The reason for the quota was that the

raw material is considered as "essentially important for the domestic market" (Timber Industry News, 2018).

2.2.5 Brexit

The forest products trade, especially in Europe, are likely to be affected by the looming Brexit, when the UK will leave the EU.

After Brexit, the Forest Law Enforcement, Governance and Trade (FLEGT) licensing scheme and related FLEGT voluntary partnership agreements (VPAs) concluded between the EU and other countries will no longer apply in the UK.

The UK finalized its statutory instrument, the "United Kingdom Timber Regulation" (UKTR) in November 2018. The aim of the UKTR is to ensure that the provisions of the EU Timber Regulation (EUTR) are operable after the UK leaves the EU. As stated in the explanatory memorandum, the changes compared with the EUTR include "amending references to EU, EU institutions and EU administrative processes to UK equivalents; updating legal references to refer to relevant UK legislation; and retaining the requirement for government to report".

The UK Department for Environment, Food and Rural Affairs (DEFRA) published guidance on trading timber if there is no Brexit deal. In that case, businesses importing timber and timber products from non-EU and European Economic Area (EEA) countries would have to carry out due diligence to demonstrate that the timber was harvested legally. The Office for Product Safety and Standards (the UK competent authority) is delivering workshops on the EUTR aimed at improving business capacity to understand the rules around risk identification and mitigation measures (Client Earth, 2019).

Research published by the Government of Ireland identified several Brexit impacts of concern in the wood, wood products, paper and printing sectors, including the imposition of trade tariffs, a re-established physical border, and the absence of a common customs union (Government of Ireland, 2018).

2.3 Sustainable and legal wood supply

2.3.1 EU Forest Law Enforcement, Governance and Trade Action Plan

The EU FLEGT Action Plan, adopted in 2003, is an initiative to address illegal logging and the economic, social and environmental harm it causes through measures in the EU and in countries that export timber and timber products to the EU. One such measure was the adoption of the EUTR, which prohibits EU businesses from importing or trading illegal timber. The EUTR is applicable to the EEA, including Iceland, Liechtenstein and Norway (Switzerland is not in the EEA). The EUTR became law in the EEA on 1 May 2015.

In October 2018, the European Commission published its second report on the implementation of the EUTR covering the period March 2015–February 2017 and drawing on information provided by 28 member countries and Norway. This report found that almost all countries have taken action to comply with the requirements of the EUTR, and the number of checks and sanctions for violations has increased significantly. The report cited the need to provide more uniform and effective application of the regulation across countries. It also recognized that technical capacity and resources must be sufficient to meet the needs for compliance checks and enforcement activities. Across all countries, more than 17,700 checks were performed during the reporting period on operators placing domestic timber on the market and almost 2,800 checks were made on operators placing imported timber on the market. For domestic timber, 20 countries performed 80% or more of their planned checks and, for imported timber, 22 countries achieved 80% or more of planned checks (European Commission, 2018c).

Fifteen tropical countries are negotiating or implementing VPAs with the EU (EU FLEGT Facility, 2018); these countries account for 80% of the EU's tropical timber imports (European Commission, 2016). Two countries in Latin America (Guyana and Honduras) have signed VPAs since the previous edition of the *Review* was published. In 2016, Indonesia became the first country to issue FLEGT licences for timber products exported to the EU. It is estimated that, of the €3.78 billion of tropical wood products imported into the EU in 2017, 21% comprised FLEGT-licensed products from Indonesia and 54% was from the other 14 countries engaged on FLEGT with the EU (Cameroon, the Central African Republic, the Congo, Côte d'Ivoire, the Democratic Republic of Congo, Gabon, Ghana, Guyana, Honduras, the Lao People's Democratic Republic, Liberia, Malaysia, Thailand and Viet Nam) (EU FLEGT Facility, 2019a). Nine months after the launch of FLEGT-licensing in Indonesia it was reported that more than 20,000 licences for the export of wood products to the EU had been issued, rising to more than 39,000 after twelve months (Global

Wood Markets Info, 2017a; EU FLEGT Facility, 2019b). The Indonesian system (SILK) listed over 2,700 certificate holders in April 2019 (SILK, 2019). An assessment of Ghana's timber legality assurance system has been initiated that could lead to Ghana becoming the first country in Africa and the second worldwide to issue FLEGT licences (EU FLEGT Facility, 2019c).

2.3.2 US trade enforcement

The US Lacey Act, enacted in 1900, addresses the trafficking of wildlife, fish and plants that have been illegally taken, possessed, transported or sold. After a series of amendments in 2008, the Act now requires that import declarations accompany a wide range of forest products (USDA, 2015). Investigations are active into whether US companies could be sourcing illegally obtained timber for siding and other products from West Africa and flooring products from Brazil (Cannon, 2018; Fair, 2019).

In October 2017, the US Trade Representative took action to block timber imports from a Peruvian exporter based on illegally harvested timber found in its supply chain. The enforcement action was taken under the US-Peru Trade Promotion Agreement, which includes specific requirements on forest-sector governance (US Trade Representative, 2017b). The US Timber Committee issued a report in September 2018 with the findings of the timber verification undertaken in Peru and resulted in the identification of continued challenges in ensuring legality in the supply chain, including the need to strengthen traceability, establish log books, improve the timing of post-harvest inspections and enhance capacities for detecting discrepancies and potential fraud (US Timber Committee, 2018).

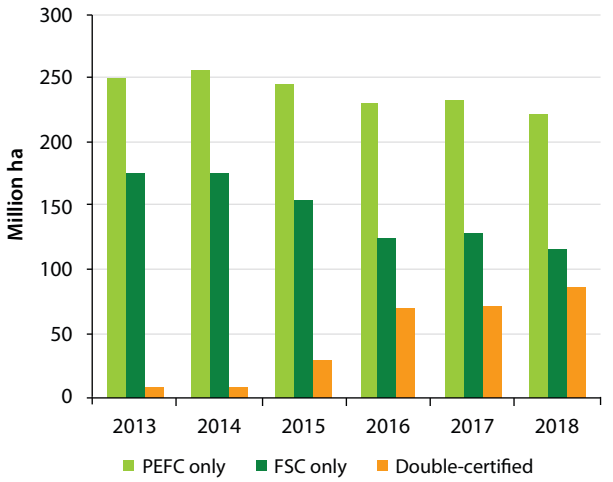
2.3.3 Certified forest area

The two major certification schemes – the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) – released data in February 2019 on their certified forest areas and the extent of double-certified forests, indicating a further increase in the area of double-certification and a decline in the total (net) area of certified forest globally (graph 2.3.1).

The area of double-certified forest increased from 71 million ha in mid-2017 to 86 million ha in mid-2018, influenced primarily by changes in Brazil, Canada, the Russian Federation and Sweden. The two organizations reported a combined total of 510 million ha of certified forest, as of mid-2018; after accounting for double-certification, the total net certified forest area was 424 million ha (FSC, 2019a). This represents a decrease of 7 million ha in the total area compared with the previous reporting period. There is double-certified area in 32 countries, and graph 2.3.1 shows that the growth in double-certification is a significant trend. Although double-certification might be a viable business strategy to enable access to different markets seeking competing programmes, it also represents inefficiencies and even redundancies that create opportunity costs in the sector and may reduce competitiveness.

GRAPH 2.5.1

FSC and the PEFC certified forests areas, 2013-2018



Sources: UNECE/FAO, 2014; 2015, 2016; 2017; 2018 and FSC, 2019a.

As of December 2018, the FSC reported more than 200 million ha of certified land area (FSC, 2018a). This was an increase of nearly 7 million ha compared with the area reported in December 2017, with the largest gains in Belarus and the Russian Federation. The most recent FSC reporting (April 2019) showed a decline in total certified area of about 2 million ha globally, to 198 million hectares (FSC, 2019b).

The PEFC reported that 309 million ha of forests was certified under its umbrella, as of December 2018, down from 313 million ha in December 2017. Increases were reported in Africa, South America, Europe and Asia, including the first PEFC certification in Africa – about 600,000 hectares in Gabon. There was also a substantial increase in the area of PEFC-certified forest in Argentina, from 22,000 ha to 247,000 ha, and increases were reported in China, Japan, the Russian Federation and Sweden. The major decrease was in Australia, from 23.6 million to 11.3 million ha, and smaller decreases were reported in Belarus, Canada, France, Latvia, Slovakia, Switzerland and the US (PEFC, 2018a).

2.3.4 Internal developments in certification schemes

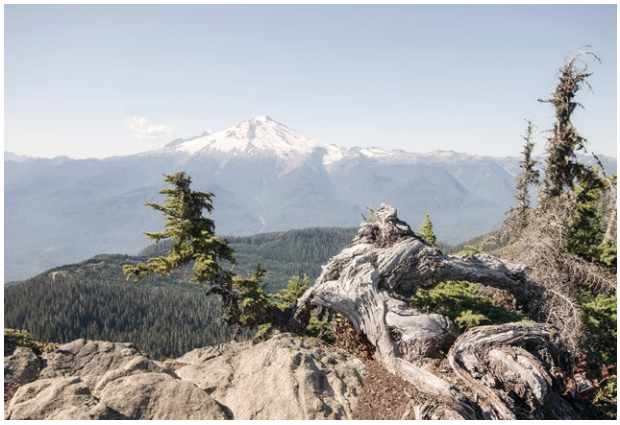
The FSC has provided final approval for supplementary certification requirements for US national forests, with the

revised standard coming into effect on 15 March 2019 (FSC, 2019c). The approval represents the completion of a process outlined in the FSC US Federal Lands Policy established in the late 1990s and which has prevented the certification of lands managed by the US Forest Service (Fernholz *et al.*, 2012). There has been no recent indication that the US Forest Service intends to pursue the certification of national forest lands.

The FSC has also given final approval to the National Risk Assessment (NRA) for the US. The FSC US NRA covers the conterminous US (i.e. excluding Alaska, Hawaii and US territories). The development of the FSC US NRA has been a complex, multiyear process, with controversies associated with the identification of areas of risk in specific forest regions and forest types, including substantial areas in the southeast and northwest parts of the country. The NRA replaces the use of company-based risk assessments in the FSC chain-of-custody (CoC) system. Specified risk areas identified in the FSC US NRA include critical biodiversity areas, old-growth forests, priority forest types, and areas at risk of forest conversion. The NRA includes mandatory and recommended control measures for mitigating risk when sourcing from these areas, including actions such as written agreements with suppliers; participation in FSC regional meetings and dialogues; and sharing requested information with the FSC. Certificate holders with controlled wood within the scope of their FSC CoC certificates must incorporate the US NRA into their due-diligence systems by 5 October 2019 (FSC US, 2019). To date, the FSC has approved risk assessments in 46 countries, and an additional 14 are in development (FSC, 2019d).

The PEFC has reported that four countries gained PEFC endorsement of their national systems in 2018 – North Macedonia, the Republic of Korea, Romania and South Africa. Processes are also underway for PEFC endorsement of national systems in Bulgaria, Cameroon, Ghana, India and Thailand. The Sustainable Forestry Initiative (SFI), a PEFC-endorsed national system operating in Canada and the US, achieved the greatest growth among PEFC programmes in 2018, gaining 9 million ha of certified forest area. The biggest increase in PEFC CoC certification was in Japan, with the addition of 168 certificates.

The PEFC published a revised Sustainable Forest Management and Group Certification benchmark standard in November 2018. A significant accomplishment in the revised benchmark is the extension of PEFC certification for application beyond natural forests and plantations to trees outside forests. This revision provides access to certification for farmers and other landowners who own or manage trees on agricultural or settlement land. In addition, the Sustainable Forest Management and Group Certification benchmark can now be applied to agroforestry and urban forestry management (PEFC, 2018b). The opportunity to certify trees more broadly



across landscapes may be helpful in generating sustainable, diversified farm income while supporting improvements in management practices.

The inclusion of urban forest management within the scope of the PEFC comes at a time when global populations are increasingly concentrated in cities and the products, services and benefits of trees in these areas are gaining in importance. In the US alone, it is estimated that there are about 4 billion urban trees and another 70 billion trees growing in metropolitan areas. Researchers in the US Forest Service forecast that urban land in the conterminous US – which occupied 3.1% of the land area in 2000 – will nearly triple in size (to more than 8% of the US land area, larger than the state of California) by 2050. Urban forests can provide significant volumes of wood: estimates of removals from urban forests in the US (due to management activities as well as to damage caused by pest infestations, wind storms and other disasters) range from 16 million to 38 million green US tons per year (Bratkovich, 2008). Even the lower end of this range is larger than the total annual harvest in national forests in some years. The federal US Forest Inventory and Analysis programme expanded recently to include inventory protocols for urban forests.

In Canada, Project Learning Tree Canada (an initiative of SFI) has collaborated with the Government of Canada on a goal to place more than 1,600 youth in green jobs across the country by 2020. In 2018, 755 youth obtained various forest, conservation and park jobs in Canada through this initiative. Nearly 60% of the jobs were placements within the SFI network of participants and included work in managed forest landscapes as forest technicians, wildfire biologists, Indigenous knowledge coordinators and invasive-species technicians. The remaining 40% of jobs were in the Canadian Parks Council network and included jobs in parks and protected areas as park rangers, trail technicians and park attendants. The goal in 2019 is to place an additional 1,000 youth in green jobs across Canada (PLT Canada, 2019).

2.3.5 Certified forest production

In August 2017 the FSC announced its intention to increase its market share to 20% by 2020, reporting that FSC-certified natural forests and plantations produced an estimated 16% of global timber by volume in 2016 (Global Wood Markets Info, 2017b). In 2018, the FSC reported that approximately 423 million m^3 of wood is harvested in FSC-certified forests per year worldwide, which is 22.6% of global industrial roundwood production (FSC, 2018b). The FSC is the only certification scheme to publicly report an estimate of certified forest production.

2.3.6 Chain-of-custody certification

Graph 2.3.2 shows the number of CoC certificates issued by the FSC and the PEFC from 2010 to 2019. The FSC reported 35,772 CoC certificates as of December 2018, an increase of about 5% compared with mid-2018. The most recent FSC data (for April 2019) showed a further increase to 37,063 CoC certificates. Similar to the previous reporting period, there was growth in Europe and Asia and a decline in North America. Approximately 79% of the growth in CoC certification is attributable to Asia, including additional certificates in Bangladesh, China, India, Japan, Pakistan, Taiwan Province of China, Thailand, Turkey and Viet Nam. North America's share of FSC CoC certificates globally declined from more than 10% in December 2017 to 8.6% in April 2019 (FSC, 2017; FSC, 2019b), while Asia's share rose from 30% in 2017 to 35% in April 2019.

The PEFC reported a minor net decline in global CoC participation, from 11,484 in December 2017 to 11,466 in December 2018. Declines were reported in France, Germany and the UK (the three countries with the greatest number of PEFC CoC certificates), down by 4% overall from 4,912 CoCs in 2017 to 4,720 in 2018. Declines were also noted in Canada and the US, while there were increases in many countries, including China, Czechia, Finland, Japan, the Netherlands, Poland, Portugal, Slovakia and Sweden (PEFC, 2018b).

The International Organization for Standardization (ISO) has published a CoC standard (ISO 38200:2018) for wood and wood-based products, which will enable the tracking of various categories of materials in CoCs. In addition to tracking wood from sustainably managed forests, it will allow tracking from verified, specified or recycled origins (ISO, 2018).

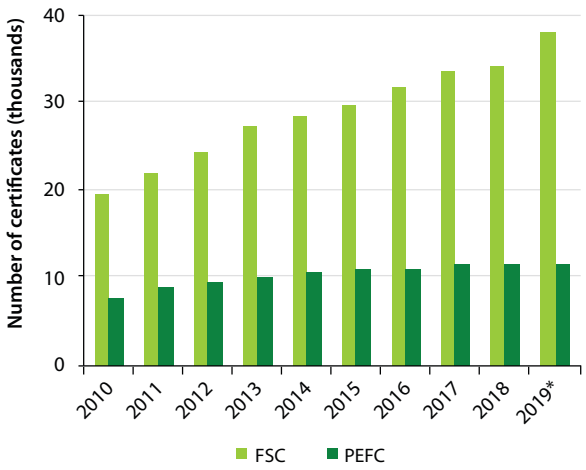
2.3.7 Certification of woody biomass

The Sustainable Biomass Program (SBP) reported the production and sale of more than 9 million tonnes of SBP-certified biomass in 2018, an increase of 80% over 2017. The SBP-certified pellets consumed in 2018 represented 65% of the EU28 pellet consumption, up from 46% in the previous reporting period. The number of SBP certificate holders increased from 139 in March 2018 to 154 at the end of 2018, including 123 biomass producers, 26 traders and five end-users. The global reach of SBP also increased, with the addition of certification activities in Belgium, Brazil, France, Italy and Switzerland (existing countries were Australia, Belarus, Canada, Denmark, Estonia, Germany, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, the Russian Federation, Spain, Sweden, the UK and the US) (SBP, 2019).

Created in 2013, the SBP has enjoyed rapid growth and market penetration. It represents a "second-generation" certification scheme in the forest sector because it recognizes the credibility of existing forest certification systems (i.e. the FSC and the PEFC) while seeking to develop solutions for the requirements of a specific market (biomass) and the challenges faced by biomass producers. As the market expands beyond the dominant interests in North America and Europe, the SBP will be challenged to maintain its consistency, transparency and growth.

GRAPH 2.5.2

Number of chain-of-custody certificates issued globally by the FSC and the PEFC, 2010-2019



Notes: Numbers denote CoC certificates irrespective of the size of individual companies or of production or trade volumes. * FSC data are as of June 2019; PEFC data are as of March 2019.

Sources: FSC, 2019d; PEFC, 2018b.

2.3.8 Minimizing wildfire effects on the resource in the United States

A new "shared stewardship" strategy for addressing forest health and wildfire risk has been announced in the US with a goal of further coordination between the US Forest Service and state forest agencies to accomplish landscape restoration (USDA Forest Service, 2018a). Wildfire risks are a growing

concern in the country, where it is estimated that there are more than 3 billion burnable acres (1.2 billion hectares); more than 12,000 structures were destroyed by wildfire in 2017. The US Forest Service and partners have been accelerating the pace of forest restoration work, with the area treated annually rising from 1.7 million ha in 2011 to 1.9 million ha in 2014 and 2.4 million ha in 2016 (USDA, 2018b).

2.3.9 Forest conservation in the Russian Federation

The President of the Russian Federation signed an executive order on national goals and strategic objectives through to 2024. There are three directions: "Human Capital", "Comfortable Living Environment" and "Economic Growth". "Comfortable Living Environment" includes the national project "Ecology", which features, among other projects, "Forest Conservation" (to be implemented by the federal forestry agency, Rosleshoz). The total financing of the Ecology project will be 4 trillion roubles (of which 3.2 trillion roubles will be from private investors). About 41 billion roubles will be allocated from the federal budget between 2019 and 2024 for the implementation of the Forest Conservation project, including 6.9 billion roubles in 2019. The law also improves legislation on reforestation and afforestation. In particular, it focuses on the use of containerized seedlings rather than bare-root stock because of their much higher survival rates. The goal is to increase the ratio of reforestation and afforestation in felled and other deforested lands from 62.3% in 2018 to 100% in 2024. The project also includes measures to significantly reduce the damage caused by forest fires and to conserve biodiversity by increasing the protected area (mostly forest) by 5 million ha (Saker, 2018).

A new law (Federal Law No. 538-FZ: "On Protective Forests") adopted in 2018 stipulates five categories of protective forest. In particular, it addresses the conservation and management of urban forests, including in areas designated for urban development (Whatwood, 2019).

The Russian Federation also has a new law (Presidential decree 204 dated 7 May 2018) on compensatory reforestation aimed at ensuring that harvested forestlands are reforested after harvest. Trees should be planted in the same region where they were cut down (Whatwood, 2019).

The Russian Government approved "the Strategy for the Development of the Forest Industry of the Russian Federation until 2030", the aim of which is to enhance sustainable forest management by increasing the long-term competitiveness of the forest industry; the contribution of the forest industry to social and economic development; and, the effective use, preservation, protection and reproduction of forests. Specifically, the plan calls for an increase in the production of wood pulp (for domestic use and export), paperboard and sanitary and hygienic products (domestic markets), sawnwood, wood-based panels, and furniture. Wooden housing for both domestic and export markets has also been targeted. The aim of the strategy is to double the contribution of the forest industry to GDP (from 0.5% to 1%), with significant increases in the sector's added value, tax revenues and employment (estimated to grow from 500,000 to 820,000 jobs) (Ernst and Young, 2018).

2.4 Wood mobilization and recycling in the Russian Federation

The Russian Government has established incentives (via access and timber pricing) for the implementation of priority investment projects in the forest sector. These now include the modernization of wood-processing infrastructure with a minimum capital investment of 500 million roubles; and the creation of forest and wood-processing infrastructure with a minimum capital investment of at least 750 million roubles (Ukrainian Forester, 2018).

In 2018, the Russian State Duma adopted a law on the cancellation of personal income tax when delivering waste paper, exempting the income earned from the delivery of waste paper from the payment of personal income tax. The measure is designed to increase the collection and disposal of paper waste generated by citizens in everyday life. Previously, the funds received from the delivery of waste paper to a special organization were considered to be income and therefore subject to personal income tax of 13%. The exemption should also help reduce the volume of solid waste and the cost of its disposal. The Russian Federation generates about 14 kg of waste paper per person per year, amounting to 2.1 million tonnes annually. Of this, only about 21,000 tonnes (1%) is recycled (Whatwood, 2018).

As of 1 January 2019, Russian citizens are allowed to collect deadwood in forests for their own needs. The law applies to dry branches or trunks of trees that fall to the ground as a result of exposure to storms, winds or significant snowfalls (Deutsche Welle, 2019).

2.5 Bioenergy, biomass and biofuels

The original Renewable Energy Directive (2009/28/EC) establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels comes from renewable sources by 2020.

The revised Renewable Energy Directive (2018/2001/EU) entered into force in December 2018 as part of the Clean Energy for All Europeans package, the aims of which are to ensure that the EU remains a global leader in renewables and, more broadly, to help the EU meet its emissions reduction commitments under the Paris Agreement on climate change (European Commission, 2019d).

The revised directive establishes a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.

Under the new governance regulation, which is also part of the Clean Energy for all Europeans package, EU countries are required to draft ten-year national energy and climate plans (NECPs) for 2021-2030, outlining how they will meet the new 2030 targets for renewable energy and energy efficiency. Member states needed to submit draft NECPs by 31 December 2018 and should be ready to submit the final plans to the European Commission by 31 December 2019.

Most of the other new elements in the new directive need to be transposed into national law by member states by 30 June 2021 (European Commission, 2018d).

The directive contains a long list of coefficients for typical and default values of greenhouse-gas savings by energy source. The coefficients take into consideration the origin of biomass, the type of energy used in processing, and the transportation distance. Based on these coefficients, greenhouse-gas emissions savings from woody biomass vary from 11% to 93%. For example, wood pellets transported for more than 10,000 km, with a natural gas boiler used to provide the process heat to the pellet mill, and electricity for the pellet mill supplied from the grid, will obtain very low greenhouse-gas savings, but woodchips from forest residues transported less than 500 km would obtain the highest score. The list of coefficients represents a major improvement in clarity over the 2008 directive.

A group of plaintiffs filed a lawsuit at the European Court of Justice (Case T-141/19) in March 2019 against the European Union to challenge the inclusion of forest biomass in the second Renewable Energy Directive.

2.6 Climate change and carbon markets

Although industrial emissions are regulated under the EU Emissions Trading System, the numerous exemptions in the legislation mean that carbon pollution by heavy industry has not decreased since 2012. An example of the effort to make more progress is EU legislation setting mandatory emissions reduction targets for new cars. The first targets were applied in 2015 and stricter targets will apply in 2021; the legislation has led to the formulation of the "clean mobility standard" for

cars and vans aimed at reducing pollution and improving air quality. It is projected that, as a result of this new standard, emissions from new cars will decrease by 37.5% by 2030 compared with emissions in 2021, and emissions from new vans will decrease by 31%. This new standard is a stepping stone towards a modernized and more competitive European transport sector and a climate-neutral economy in line with the EU's commitments under the Paris Agreement (Carbon Market Watch, 2019; European Commission 2019e).

Efforts are increasing in North America to put a price on greenhouse-gas emissions and create market-based incentives to reduce emissions and energy use. Currently, 10 of the 50 US states and 5 of the 13 Canadian provinces and territories have either a carbon tax or a cap-and-trade system. A carbon tax charges a fee for every unit of carbon dioxide emitted; on the other hand, a cap-and-trade system puts a cap on greenhouse-gas emissions and issues emissions permits. Emitters can trade these permits, enabling the market to find the lowest-cost emission reductions available.

Canada signed the Paris Agreement in 2015, under which it is obliged to determine, plan and report on its nationally determined contribution to mitigate global warming. Canada's Pan-Canadian Framework on Clean Growth and Climate Change has determined a carbon tax benchmark, in which the carbon price begins at C$10 per tonne and increases until it reaches a maximum of C$50 per tonne in 2022. This progression will enable the provinces of Canada to develop their own carbon pricing plans by 2019 or have a federally mandated carbon tax imposed (Government of Canada, 2016).

British Columbia was the first province to endorse carbon pricing, and it introduced North America's first broad-based carbon tax in 2008. Emissions are priced at C$35 per tonne in the province, with the price to increase by C$5 per year until 2021 (Government of British Columbia, 2019). The Northwest Territories, Prince Edward Island, Newfoundland and Labrador, and Nova Scotia have endorsed the carbon

policy, developed their own plans for carbon pricing by the federal deadline, and begun implementation in early 2019. Quebec is implementing a cap-and-trade programme (Parliament of Canada, 2018). Ontario and Alberta both initially implemented carbon-related programmes but cancelled these after short periods. Saskatchewan has opposed carbon pricing and took the federal government to court, arguing that it is unconstitutional to impose such a federal tax. The province lost the case at the Saskatchewan Court of Appeal in May 2019 and is now appealing to the Supreme Court of Canada, with the case scheduled for December 2019 (CBC News, 2019). Other provinces opposing the carbon tax policy await this decision before taking further measures (CBC News, 2019).

In the US, the federal government has announced an intention to withdraw from the Paris Agreement. In accordance with Article 28 of that agreement, a withdrawal cannot occur until 4 November 2020. Until that date, the US may be bound to its commitments under the Paris Agreement, including the requirement to continue reporting its emissions to the United Nations (UNFCCC, 2017).

In the absence of an overarching federal carbon market proposal, some US states have enacted or proposed regional carbon-pricing systems. In 2017, California amended its cap-and-trade programme to reauthorize and extend the programme through 2030 to achieve California's greenhouse-gas reduction target of 40% below 1990 levels (Centre for Climate and Energy Solutions, 2019a). The northeastern states of the US have also agreed to develop a regional cap-and-trade programme and have started building a programme covering transportation emissions that could eventually lead to a significant regulatory and carbon-pricing regime (Centre for Climate and Energy Solutions, 2019b).

Oregon has proposed a cap-and-trade programme, but this has resulted in strong opposition due in part to its potential to increase energy costs. The logging industry has also opposed the programme, arguing that the carbon-pricing policy will result in mill closures and job losses in the forest sector and elsewhere and will ultimately negatively affect economic stability (Gleason, 2019).

2.7 Green building

The European Commission referred Czechia and Slovenia to the EU Court of Justice on 24 January 2019 for failing to comply with the Energy Performance of Buildings Directive (2010/31/EU). According to this directive, all member states must establish and apply minimum energy performance requirements for all buildings, ensure the certification of building energy performance, and require the regular inspection of heating and air-conditioning systems. The directive also requires member states to ensure that all new buildings are nearly zero-energy by 2021. All member states must ensure that energy performance certificates are displayed in certain buildings frequently visited by the public (this rule is designed to increase public awareness of the importance of consuming energy efficiently and provide an incentive for renovations). Neither Czechia nor Slovenia have, according to the Commission, accurately transposed these requirements into their national laws. The EU Commission sent official letters to both member states in 2017 and 2018 advising them of their duty. To date, however, neither member state has changed its legislation to align with the requirements of the directive (European Commission, 2019b).

The European Commission decided on 7 March 2019 to refer Spain to the EU Court of Justice for failing to comply with the requirements on individual metering in multi-apartment and multipurpose buildings, as specified in the Energy Efficiency Directive (2012/27/EU). The directive requires the installation of individual meters for heating, cooling and domestic hot water for all multi-apartment and multipurpose buildings in which occupants are supplied with services from a collective installation such as a common boiler. This requirement is applicable to all existing buildings, where technically feasible and cost-efficient. The Spanish national measures impose this requirement only for new buildings (built after 2007) – not for all existing buildings. Thus, Spain may not have transposed the requirements of this directive accurately, which is problematic because the EU rules were meant to have been implemented into national law by 5 June 2014 (European Commission, 2019c).

The Russian Government approved incentives for the purchase of wooden houses in a 2018 provision that will subsidize mortgage rates to individuals purchasing prefabricated wooden houses from manufacturers (up to a maximum of 3.5 million roubles). The government is allocating 197.7 million roubles to support domestic demand for wooden house construction products and increase the

production volume of prefabricated wooden houses (Russian Forest Alliance, 2018).

The International Code Council (ICC) has approved 14 changes to the tall mass timber code following a multiyear effort by the ICC Ad Hoc Committee on Tall Wood Buildings. The process included extensive review of the building science addressing the impacts of fire on mass timber buildings – five full-scale fire tests were conducted on an apartment structure constructed of mass timber to observe and study the material's performance in various conditions (ICC, 2019). Public comment and an ICC voting process were also components of the final approval. The changes create three new types of construction: IV-A, IV-B, and IV-C. These types vary in their design for protected or exposed timber, required fire protection, and maximum number of stories (table 2.7.1).

The development of the 2021 International Building Code (IBC) through the ICC is continuing in 2019 with additional considerations for tall wood buildings. The release of the 2021 IBC is anticipated in late 2020. The states of Oregon, Utah and Washington in the western US have already taken action to allow the use of the new tall wood building code (AWC, 2019). Changes to support tall wood buildings are also being considered in California and the cities of Seattle and Denver.

TABLE 2.7.1

Comparison of construction types for all mass timber

Type	*Required fire protection (structure frame and exterior walls)*	*Fire Resistance Rating*	*Maximum number of stories (height in feet/meters)*
IV-A	Fully protected, interior and exterior	3 hours	18 (270'/82m)
IV-B	Protected exterior, limited exposed interior	2 hours	12 (180'/55m)
IV-C	Protected exterior; exposed interior	2 hours	9 (85'/26m)

Source: AWC, 2018.

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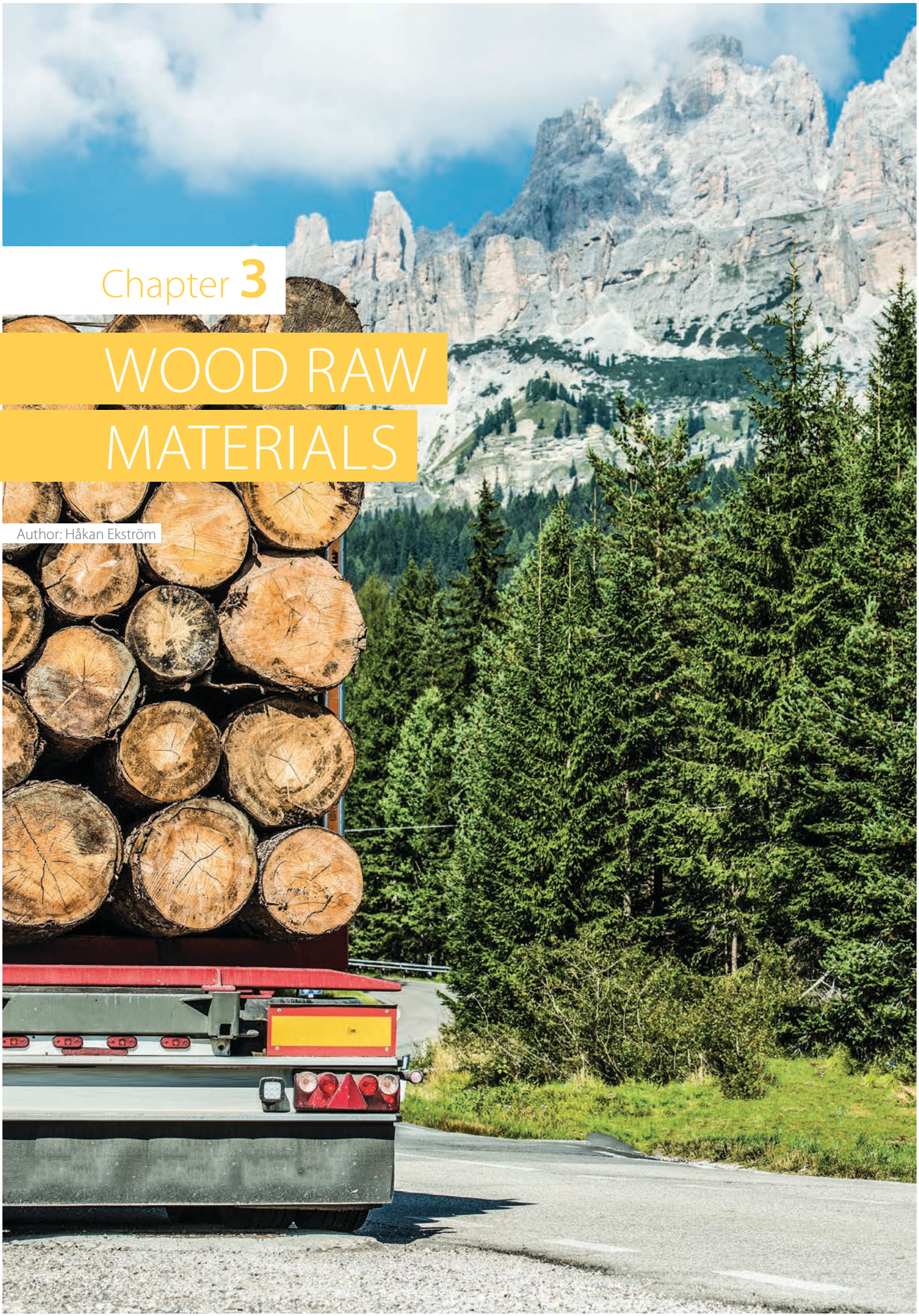


Chapter 3

WOOD RAW MATERIALS

Author: Håkan Ekström

Highlights

Total roundwood removals in the UNECE region, including industrial roundwood and woodfuel, reached a record high of 1.4 billion m^3 in 2018 after a sixth consecutive year of increase.

The total international trade of softwood logs reached a record high of 93 million m^3 in 2018 (a 52% increase in ten years).

China was the world's number-one importer of industrial roundwood in 2018 (with 43% of total imports), followed by Austria (9%), Germany (8%), Sweden (7%) and the Republic of Korea (4%).

It is estimated that storms and beetles have damaged 110 million-140 million m^3 of timber in central Europe in the last two years, mainly in Austria, Czechia, France, Germany, Italy, Slovakia and Switzerland. Northern Europe is also seeing increased beetle activity.

Industrial roundwood removals increased by almost 12% in the CIS subregion in 2018, to a record 245 million m^3, driven by increases in both coniferous and non-coniferous logs in the Russian Federation.

It is expected that most future investments in the Russian forest industry will be in Siberia and the Far East to meet rising demand for lumber, plywood and pulp in China. There are also plans, however, to increase investment in panels, cross-laminated timber and pulp in the western provinces.

The Russian Federation is the only country in the CIS subregion exporting substantial volumes of roundwood. Belarus and Ukraine have both banned log exports.

Canadian timber harvests fell in 2018 to the lowest level in four years due to a reduced annual allowable cut in British Columbia and lower demand for softwood logs in the country's sawmill sector.

The trade dispute between China and the US has resulted in a dramatic decline in the value of quarterly softwood log shipments from the US to China – down by $130 million from the second quarter of 2018 to the first quarter of 2019. The US share of China's roundwood imports dropped from 17% to 11% over the same period (despite a record year of log imports for China).

Wood raw-material prices were volatile in 2018 and early 2019, due partly to the fluctuating availability of sawlogs.

The biggest prices declines between the first quarter of 2018 and the first quarter of 2019 were in Europe, especially in the central and eastern parts. In North America, log prices fell in western US and eastern Canada, increased slightly in the US South and jumped 16% in Interior British Columbia.

Russian softwood sawlog prices continued their four-year climb in rouble terms in the first quarter of 2019. Average prices in the northwestern provinces and Siberia were down by about 10% in the first quarter of 2019, year-on-year.

3.1 Introduction

This chapter focuses on the production, consumption, trade and prices of industrial roundwood[4] rather than of total roundwood (which would include woodfuel). See Chapter 8 for further insights into trends in wood raw materials for energy.

Total Industrial roundwood consumption in Europe, the CIS and North America grew to an estimated 1.17 billion m^3 in 2018. Annual growth over the last five years has been just below 2%, with most of the increase occurring in the CIS.

The UNECE region harvested 1.19 billion m^3 of industrial roundwood in 2018 to meet higher demand for wood raw materials, which was up by 5.1% from 2017 and by 7.9% since 2014. There were increases in removals of both softwoods (to 922 million m^3) and hardwoods (to 264 million m^3). Almost all the expansion of softwood roundwood removals and consumption in the last five years has been in Europe and the CIS (in the CIS almost entirely because of the Russian Federation), with log consumption in North America remaining fairly steady (graph 3.1.1).

Non-coniferous industrial roundwood removals increased by 5.5% between 2014 and 2018, to 264 million m^3, with increases in all regions. Removals increased by 6.4% In Europe and by 15.2% in the CIS over the five-year period (graph 3.1.2).

Total roundwood removals in the UNECE region, comprising industrial roundwood and woodfuel, reached a record high of 1.4 billion m^3 in 2018 after a sixth consecutive year of increase. North America accounted for 41% of the total harvest, Europe for 39% and the CIS for 20% (FAOSTAT, 2019).

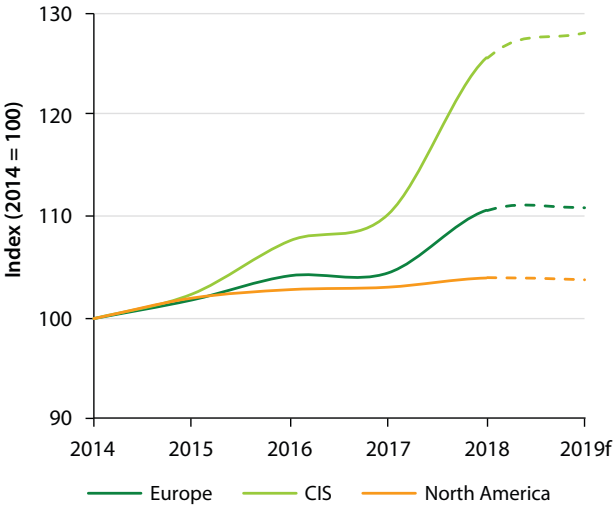
Data on roundwood volumes removed from forests for fuel are highly unreliable due to inconsistencies in data-gathering methods between countries. It is clear, however, that a fairly large share of forest removals is used for energy – and that this is an increasingly important end use. It is estimated that, in 2018, approximately 17% of total roundwood removals were logs to be used for fuel.

The global flow of softwood logs from countries with surplus wood raw materials to regions with expanding processing facilities and higher forest product consumption grew in 2018 for the third consecutive year. Data collected by Wood Resources International indicate that the total international trade of softwood logs reached a record high of 93 million m^3 in 2018, up from 82 million m^3 in 2014 and from 61 million m^3 in the wake of the global financial crisis (GFC) in 2007-

4 The terms roundwood and log are used interchangeably in this chapter. The term "industrial roundwood" excludes roundwood used for fuel (thus, it includes roundwood used to produce wood products such as sawnwood, veneer and pulp). The terms "coniferous" and "softwood" are used interchangeably, as are "non-coniferous" and "hardwood" and "sawnwood" and "lumber".

GRAPH 3.1.1

Apparent consumption of softwood industrial roundwood in the UNECE region, by subregion, 2014-2019

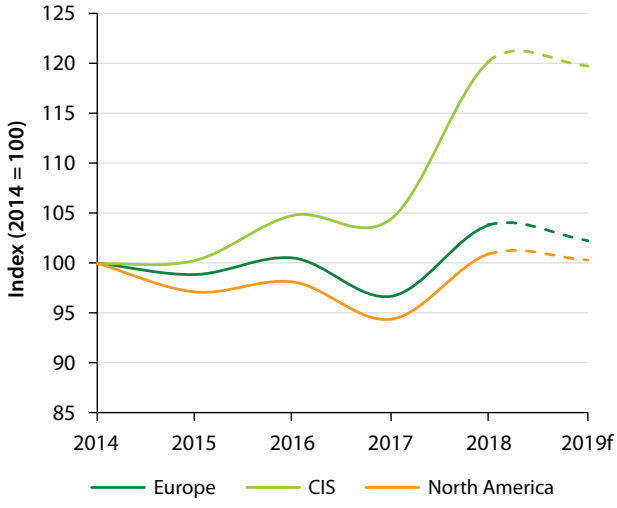


Notes: f = 2018 Committee on Forests and Forest Industry forecast. Industrial roundwood excludes woodfuel.

Source: FAOSTAT, 2019.

GRAPH 3.1.2

Apparent consumption of hardwood industrial roundwood in the UNECE region, by subregion, 2014-2019



Notes: f = 2018 Committee on Forests and Forest Industry forecast. Industrial roundwood excludes woodfuel.

Source: FAOSTAT, 2019.

2008 (an increase of more than 50% in ten years). Imports to Asia, eastern Europe and the Nordic countries grew by approximately 70% in the decade to 2018, and imports to central Europe rose by about 40%. The trade of logs within North America fell by 7% between 2007/2008 and 2018.

China was (again) the world's number-one importer of industrial softwood roundwood in 2018, accounting for 43% of global imports (40.1 million m^3), followed by Austria at 9% (9.1 million m^3), Germany at 8% (8.2 million m^3), Sweden at 7% (6.6 million m^3) and the Republic of Korea at 4% (3.9 million m^3) (table 3.1.1). The major softwood log trade flows were in the Pacific Rim, with shipments to China from New Zealand, the Russian Federation, the US and Australia accounting for four of the top five of these globally in 2018 (graph 3.1.3). In Europe, the major trade flows were from Czechia to Austria, from Poland to Germany and from Norway to Sweden.

TABLE 3.1.1

World's top five softwood log importers, 2008 and 2018
(million m^3)

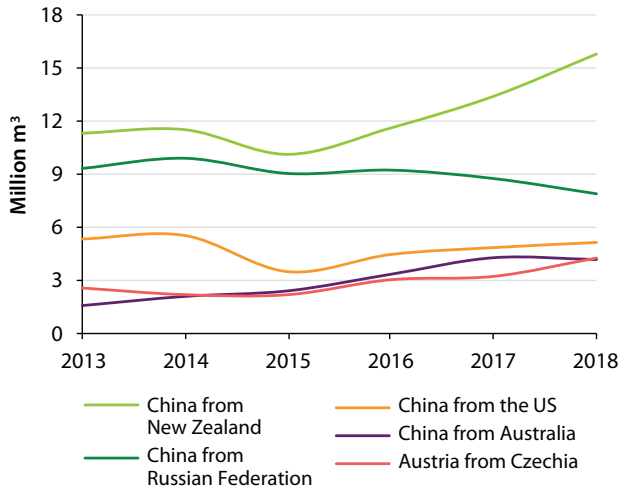
2008		*2018*	
China	18.5	**China**	40.1
Austria	6.4	**Austria**	9.1
Finland	5.8	**Germany**	8.2
Japan	5.4	**Sweden**	6.6
Republic of Korea	4.9	**Republic of Korea**	3.9

Note: Values reported in tonnes are converted using the conversion factor 0.935 tonnes/m^3 (FAO/ITTO/UNECE, in press).

Sources: Trade Data Monitor, 2019. Data for China in 2018 are from Wood Resources International, 2019a.

GRAPH 3.1.3

Top five global trade flows of softwood industrial roundwood, 2013-2018



Source: Wood Resources International, 2019a.

3.2 Europe

3.2.1 Industrial roundwood markets

Timber harvests in Europe have increased steadily since 2012 because of higher demand for wood raw materials in the solid wood sector. The consumption of logs in the sawnwood, wood panel and wood pulp industry grew by 10.3%, 8.5% and 5.1%, respectively, between 2014 and 2018.

Of the major log-producing countries in Europe, timber harvests increased most in the last five years in Finland, Poland and Turkey. Finland harvested a record 61 million m^3 in 2018, up by 23% in five years (FAOSTAT, 2019). The biggest jump was from 2017 to 2018, when demand for both sawlogs and pulplogs increased in response to expanding domestic industry production. In Poland, the major driver of higher harvest levels has been a fast-growing log export market.

Demand for logs in countries with large forest product sectors increased most in 2018 in Turkey (+15.0%), Germany (+11.8%), Finland (+11.4%) and Austria (+11.3%). The increases were more modest (less than 6%) in France, Latvia, Romania, Spain, Sweden and the UK; Poland was one of the few countries in Europe in which log demand fell (by 4.9%), mostly as a result of a competitive log export market.

The forest industry has been vigorous in the Baltic countries over the last five years or so, with investments in processing facilities (predominantly in pulp production) and a more active trade of wood raw materials among countries on the Baltic Sea. Forest companies in Baltic countries are increasingly seeing the entire area as their local wood basket, rather than just sourcing logs and wood chips domestically. The geographical expansion of the log market has not only increased trade, it has resulted in larger timber harvests in most countries in northern Europe. The industrial roundwood harvests increased by almost 10% in Estonia, Finland, Latvia,

Norway, Poland and Sweden between 2014 and 2018, to a total of 198 million m^3.

Many countries in central Europe, including Austria, Czechia, France, Germany, Italy, Slovakia and Switzerland, are hampered by large volumes of storm-damaged trees and beetle-infested forests. Northern Europe is also seeing increased beetle activity. It is estimated that 110 million-140 million m^3 of timber has been damaged in the last two years (Wood Resources International, 2019a). With a high risk of wildfires in 2019, it is likely that large volumes of logs that the forest industry could otherwise use will be further damaged, thus decreasing their value (perhaps useful only for woodfuel). The volume of timber damaged by storms and insects accounts for about 25% of the total annual timber harvest in Europe and resulted in a significant increase in removals in 2018 (table 3.2.1).

3.2.2 Trade of industrial roundwood

Europe's net roundwood imports increased from 8.3 million m^3 in 2017 to 10.4 million m^3 in 2018.

The trade of pulplogs among Baltic countries increased substantially in 2018, due mainly to increased demand for wood fibre by pulpmills in Finland and Sweden and to disruptions in the regular flow of wood fibre in northern Europe in the summer and fall of 2018. Sweden imported an estimated 6.1 million m^3 of softwood and hardwood pulplogs in 2018, and Finland imported just over 4 million m^3 of pulplogs, predominantly hardwood.

Germany has historically been a net exporter of softwood logs, but in the last decade it has almost doubled import volumes while exports have grown only modestly. Imports were down by 2% in 2018, however, and this decline continued in early 2019. Germany's log imports from Norway (-34%) and Estonia

TABLE 3.2.1

Industrial roundwood balance, Europe, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Removals	399,281	422,246	421,900	5.8
Imports	50,579	56,579	57,436	11.9
Exports	42,281	46,197	46,523	9.3
Apparent consumption	407,580	432,628	432,813	6.1

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

(-79%) fell substantially in 2018 but grew from Poland (+10%) and Czechia (+14%). Because of Germany's large volume of storm- and insect-damaged timber, it is likely that the country will reverse its decade-long pattern and become a net log exporter again in 2019 because the need for imported logs will diminish and there will be a surplus supply of domestic logs that could be exported.

3.2.3 Consumption of wood fibre by the pulp industry

The consumption of wood fibre by the pulp industry increased by 5% in Europe in 2018, to 155 million m^3, the highest level in 11 years (CEPI, 2019). The biggest increases were in Finland, Sweden, Slovakia, Spain and Austria (in descending order, by volume). The most investment in pulp capacity in 2018 was in the Nordic countries. The only countries in which fibre consumption fell in 2018 were Czechia, France and Germany.

The usage of roundwood rose in 2018 to meet an increase in fibre demand, but the consumption of residual chips was virtually unchanged. Nordic countries continued to be the major pulpwood importers, totalling over 14 million m^3 in 2018.

The share of imported softwood fibre (both logs and chips) increased from 30.0% of the total fibre furnish by the European pulp sector in 2017 to 32.2% in 2018. The import share of softwood fibre was only 28.0% in 2008.

3.3 The CIS subregion

3.3.1 Industrial roundwood markets

Industrial roundwood removals increased by almost 12% in the CIS in 2018, to a record 245 million m^3 (table 3.3.1). Almost all the increase was due to growth in hardwood and softwood removals in the Russian Federation. About 175 million m^3 of conifer logs were harvested in the Russian Federation in 2018, which was almost 90% of the total harvest of coniferous

logs in the subregion (FAOSTAT, 2019). The majority of log production is in the Russian northwest, although most of the growth in the past decade has been in eastern provinces (WhatWood, 2019), driven by demand for lumber in China. The Chinese forest industry has a history of importing logs for its raw-material needs due to a lack of domestic sources, but the trend in the last ten years has been towards imports of softwood lumber rather than logs. Chinese importers have gradually shifted their historical preference for logs away from the Russian Federation towards New Zealand and are now importing softwood lumber from their forest-rich neighbour in the north. The percentage of lumber as a share of total log and lumber import volume (roundwood equivalent) from the Russian Federation grew from 58% in 2014 to almost 80% in 2018.

In the future, it is expected that most investment in the Russian forest industry will be made in Siberia and the Far East to meet rising demand for lumber, plywood and pulp in China. There are also plans, however, to increase investments in panels, cross-laminated timber and pulp capacity in the western provinces, where it is still possible to increase timber harvests without reducing sustainability, thereby supplying new processing plants with competitively priced logs. Some of the new capacity added in 2018 resulted in larger year-on-year harvest increases in the west than in the east.

3.3.2 Trade of industrial roundwood

The Russian Federation is the only country in the CIS subregion exporting substantial volumes of roundwood. Belarus and Ukraine – the two other countries in the subregion with large forest resources – have both banned log exports.

The volume of coniferous industrial roundwood exports from the Russian Federation has fallen for two straight years and was only 11.0 million m^3 in 2018, the lowest export volume in more than 20 years. Export shipments have fallen by more than 55% since the country imposed high log export taxes in 2009, increasing the availability of logs for the domestic industry, and softwood lumber exports have doubled over the same period (a win for the Russian Federation in terms of money and jobs staying in the country).

Log exports have fallen most in the last five years to China, from 11.0 million m^3 in 2014 to 9.2 million m^3 in 2018. The decline continued in the first quarter of 2019, with shipments down, over the same quarter in 2018, to all major trading partners, including China (-29%), Finland (-29%), Kazakhstan (-1%) and Japan (-28%).

The opposite trend has applied to hardwood log exports, with a substantial increase in volume in the last decade. The Russian Federation exported just over 8 million m^3 of hardwood logs in 2018, more than double the volume in 2009. Shipments to China, Finland and Sweden accounted for 96% of the total export volume in 2018. China's sawmilling and veneer industry has increased its sourcing of hardwood logs from Siberia in recent years, resulting in a tripling of the hardwood log trade between China and the Russian Federation between 2012 and 2018. Nevertheless, Finland is still the largest market for Russian hardwood logs, with more than 4 million m^3 of pulplogs crossing the Finnish border in 2018 to meet increasing wood-fibre demand from the country's expanding pulp sector.

TABLE 3.3.1

Industrial roundwood balance, CIS, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Removals	219,362	245,109	249,584	11.7
Imports	474	486	486	2.5
Exports	21,418	19,206	20,001	-10.3
Apparent consumption	198,418	226,389	230,069	14.1

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

3.4 North America

3.4.1 Industrial roundwood markets

North American timber harvests increased overall in 2018, to 519 million m^3 (table 3.4.1) (FAOSTAT, 2019). However, the Canadian harvest declined to the lowest level since 2014 for two major reasons: a lower annual allowable cut in British Columbia, and reduced demand for conifer logs by the country's sawmill sector – a result of a weaker US wood market in the second half of 2018. US roundwood removals increased in 2018, predominantly because of higher softwood lumber production in the western states and the US South.

According to data from FAOSTAT (2019), the US industrial roundwood harvest was 368 million m^3 in 2018, up by 3.7% from 2017. However, estimates by Wood Resources International (2019a) based on derived log consumption by the forest industry and net log trade indicate that removals of industrial roundwood were more than 400 million m^3 in 2018.

The total consumption of industrial roundwood in North America grew by 2.3% in 2018, reaching the highest level since before the GFC. An estimated 385 million m^3, or 76% of total consumption, comprised softwood logs (and the remainder were hardwood logs). The biggest changes were

TABLE 3.4.1

Industrial roundwood balance, North America, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Removals	510,391	518,903	517,022	1.7
Imports	5,447	5,694	5,694	4.5
Exports	20,885	18,443	18,443	-11.7
Apparent consumption	494,953	506,154	504,272	2.3

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

the decline in softwood log consumption by the sawmill sector in western Canada and an increase in both conifer and non-conifer usage in the US.

3.4.2 Trade of industrial roundwood

North America's total log exports declined by 11.7% in 2018, to 18.4 million m^3. Although the trend has been downward for both Canada and the US in the last five years, US shipments increased slightly in the first half of 2018. They declined to China in the second half of the year, however, after China retaliated against the US by imposing tariffs on some US forest products. The fall continued in early 2019, with US shipments in the first quarter down by almost 30%, year-on-year, reaching the second-lowest quarterly export volume in nine years. US quarterly softwood log shipments to China dropped by $130 million from a four-year high in the second quarter of 2018 to the first quarter of 2019; the US market share of imported logs in China fell from 17% to 11% in the same period.

Softwood log exports from and imports to North America both fell in 2018, with net exports increasing slightly to 3.43 million m^3. The biggest changes in Canadian log export volumes were to China (down by 19% from 2017) and the US (up by 84%).

3.5 Extraregional influence on the UNECE

Before 2018, the UNECE region exported 25 million-30 million m^3 more logs annually than it imported. Net exports fell substantially in 2018, however, to 21 million m^3, mainly because of an increase in log imports by Austria, Finland and Sweden. These three countries accounted for almost all the

increase in log imports to the UNECE region, which rose from 57 million m^3 in 2017 to 63 million m^3 in 2018.

China had another record year of softwood log imports, with more than 40 million m^3 landing at Chinese ports in 2018. This was the third consecutive year of increase. Import volumes declined in the last five years from the key supplying regions of Canada and the Russia Federation but increased from Australia and New Zealand.

New Zealand continues to expand its market share in China, supplying 39% of the total log import volume in 2018, up from 32% in 2014. Market share declined most over the period in the Russian Federation (from 28% to 19%) and North America (from 23% to 18%) (table 3.5.1). The only other major change in the last few years has been an increase in pine log shipments from Uruguay, growing from just a few thousand cubic metres in 2016 to almost 2.5 million m^3 in 2018, of which most was imported by China.

A number of countries in Europe, although still small players, have expanded their presence in the Chinese industrial roundwood market in the last 6-12 months due to an oversupply of logs in their domestic markets. The European supply of coniferous and non-coniferous logs totalled almost 1 million m^3 in the first quarter of 2019, including shipments from Germany, France, Latvia, Czechia and Poland (in descending order, by volume).

3.6 Wood raw-material costs

A key factor determining the competitiveness of a country's forest industry is the cost of its wood raw materials. An estimated 65-75% of the production costs in the manufacture of softwood lumber is attributed to the costs of logs. For the pulp industry, wood-fibre costs have averaged 55-60% of the manufacturing costs in the past five years but can vary substantially between countries.

Global wood-fibre costs for the pulp industry trended upward in 2018 and the first few months of 2019 because of tight

TABLE 3.5.1

Softwood log imports to China, 2014 and 2018
(million m^3)

	2014	*2018*	*Change (%) 2014-2018*
New Zealand	11.5	15.8	37
Russian Federation	9.9	7.8	-21
US	5.5	5.1	-7
Australia	2.1	4.1	95
Canada	3	2	-33
Other	3.5	5.5	57
Total	**35.6**	**40.1**	**13**

Source: Wood Resources International, 2019a.

fibre supply and strong demand for pulp (although this may change because the pulp market showed signs of weakness in the second quarter of 2019). Sawlog prices generally fell in 2018 due to a plentiful supply or to reduced demand for lumber (depending on the region).

3.6.1 Sawlog prices

Sawlog price movements worldwide were mixed in 2018, although prices were mostly higher than in 2017. The Global Sawlog Price Index (GSPI) reached $80.73 per m^3 – its highest since 2014 – in early 2018. Prices generally increased in local currencies, but the dollar-denominated GSPI index fell by about 5% over the year as the US dollar strengthened, to $76.87 per m^3 in the fourth quarter (graph 3.6.1).

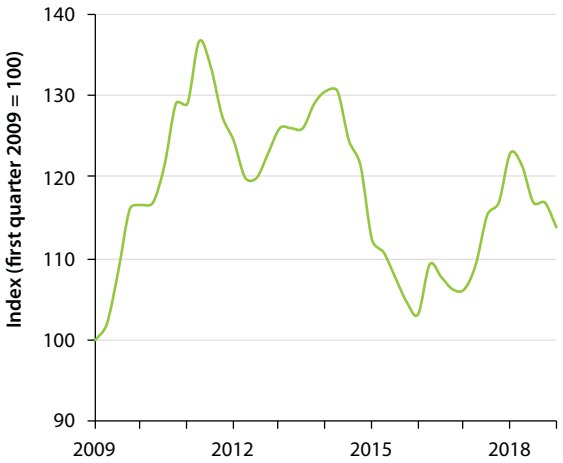
The biggest prices declines between the first quarter of 2018 and the first quarter of 2019 were in Europe, especially in the central and eastern parts. In North America, log prices fell in western US and eastern Canada, increased slightly in the US South and jumped by 16% in Interior British Columbia (graphs 3.6.2 and 3.6.3).

Large volumes of storm-damaged timber in central Europe moved sawlog prices down in the fall of 2018. Average prices in Austria, Czechia and Germany were down by about 10% in local currencies. Sawlog prices increased in the Nordic countries and the Baltic states, however, because of tighter log supply and healthy production levels in sawmills.

The euro-denominated European softwood sawlog price index (ESPI) was €81.08 per m^3 in the first quarter of 2019, down by 3.1% from the previous quarter and the lowest level since 2010. The downward price pressure on sawlogs was mostly a reflection of sufficient log supply and was only slightly connected to lower demand for raw materials in Europe's sawmill sector.

GRAPH 3.6.1

Global Softwood Sawlog Price Index, 2009-2019

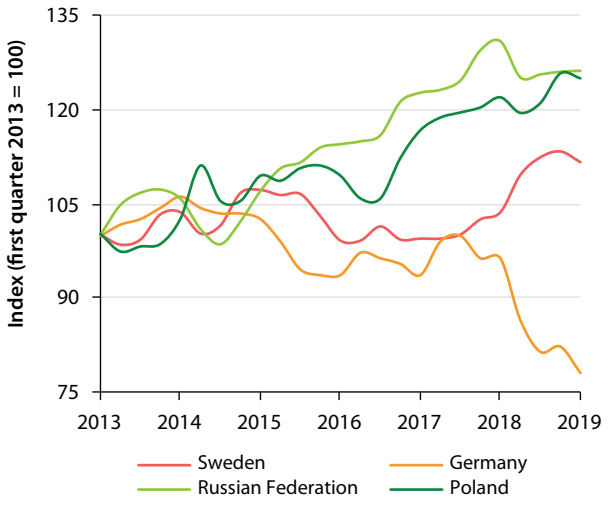


Note: Price index based on delivered sawlog prices in 19 key regions worldwide.

Source: Wood Resources International, 2019b.

GRAPH 3.6.2

Softwood sawlog price indices, selected European countries and the Russian Federation, 2013-2019



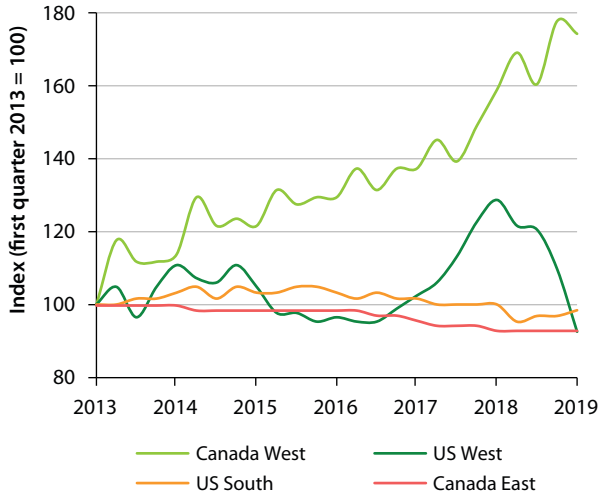
Note: Index based on delivered log price per m^3 under bark in local currencies.

Source: Wood Resources International, 2019b.

Although Russian softwood sawlog prices continued their four-year climb in rouble terms in the first quarter of 2019, log costs have declined in the last year for the country's sawmills in US dollar terms because of the strengthening dollar. Average prices in the northwestern provinces and Siberia were down by about 10% in the first quarter of 2019, year-on-year.

GRAPH 3.6.3

Coniferous Sawlog Cost Index, North America, 2013-2019

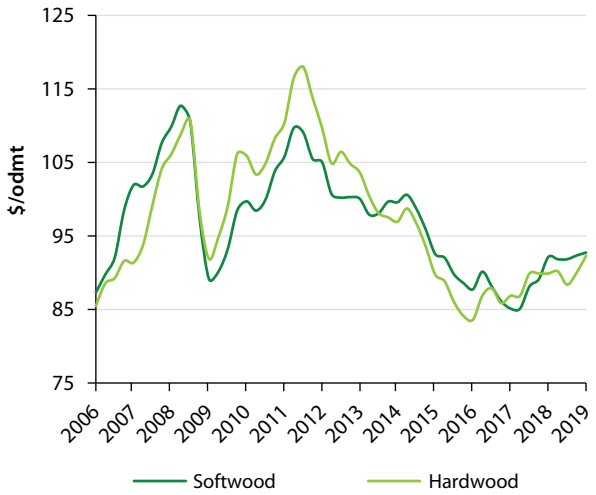


Note: Index based on delivered log price per m^3 under bark in local currencies. "US South" indicates the price for pine; "US West" indicates the price for hemlock; "Canada East" indicate prices for mixed conifers.

Source: Wood Resources International, 2019b.

GRAPH 3.6.4

Global Wood-Fibre Price Indices for softwood and hardwood pulp feedstock, 2006-2019



Note: Price indices are based on delivered pulpwood and wood-chip prices in 18 key regions worldwide. Indices are based on US dollars per oven-dry tonne (odmt).

Source: Wood Resources International, 2019a.

With lumber prices falling faster than the cost of sawlogs, sawmills in both North America and Europe saw their profit margins slide in the second half of 2018 and early 2019, as reported in the Wood Resource Quarterly (WRQ). In the western US and Canada, margins plunged to unprofitable levels and many companies decided to take market-related downtime in winter and spring 2019.

3.6.2 Pulpwood prices

Wood-fibre costs for the global pulp industry varied by country in 2018, according to Fisher International (2019), ranging from 45% to 70% of the cash costs of pulp production. The global average climbed from about 55% in late 2017 to 60% in late 2018 because wood costs increased more than other cost factors such as energy, chemicals and labour.

The prices of both wood chips and pulplogs were generally higher worldwide in 2018 than in 2017, with both the Softwood Fiber Price Index (SFPI) and the Hardwood Fiber Price Index (HFPI) reaching their highest levels in four years (graph 3.6.4).

Softwood-fibre prices (in US dollars) increased by more than 20% in the last two years in the US northwest, western Canada, the Nordic countries and Germany, according to WRQ. The only regions in which fibre costs have fallen since the fourth quarter of 2016 are Brazil and eastern Canada. Fibre costs declined in eastern Canada primarily because of an oversupply of wood chips, and they fell in Brazil due to a weakening of the Brazilian currency (the real). In Ontario and Quebec, growing lumber production has created ample supplies of residual chips, while demand for wood fibre has stagnated. As a consequence, wood-chip prices have fallen by almost 50% in six years, and some sawmills are struggling to find buyers for all their chips.

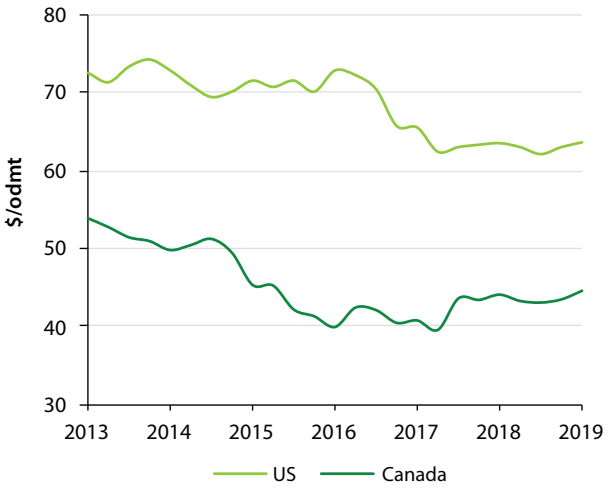
The cost of hardwood pulplogs has gone up in 15 of the 16 countries tracked by the WRQ in the last two years. Pulpmills in several of the major hardwood-pulp-producing regions, including China, Finland, Indonesia and Spain, saw their fibre costs go up by 10-30% between the fourth quarter of 2016 and the fourth quarter of 2018.

3.6.3 Fibre feedstock prices for pellet manufacturers

In the past year, higher demand and tighter supply of low-cost sawmill residues have pushed wood-fibre costs higher for pellet producers in both Canada and the US. The Pellet Feedstock Price Indices for the US (PFPI-US) and Canada (PFPI-Can) increased in the fall of 2018 and early 2019 to reach their highest levels in two years, according to the North American Wood Fiber Review (graph 3.6.5). The price increase in the US was due mainly to the wet conditions that began in late 2018 and intensified in the first quarter of 2019, which negatively affected harvesting operations and increased the cost of roundwood. There was also a slight shift between

GRAPH 3.6.5

Wood Pellet Feedstock Prices Indices, Canada and the US, 2013-2019



Note: Indices are based on delivered price per oven-dry tonne (odmt) in US dollars.

Source: North American Wood Fiber Review.

early 2018 and early 2019 from lower-cost sawmills residues to higher-cost logs.

The price increase for fibre in Canada reflects ongoing change in fibre availability in British Columbia, where most of Canada's pellet export facilities are located. There has been a decrease in the availability of sawdust and shavings due to the temporary curtailment of many sawmills in the British Columbia Interior. Although the increased volume of fibre from both grinding and chipping is making up the difference, this material is significantly costlier than sawmill residues. The higher prices of pellets overseas is enabling the British Columbia sector to handle the increase in fibre costs for now. It is likely, however, that fibre availability will become a concern in the remainder of 2019, which may result in further increases in the PFPI-Can. The annual allowable cut is likely to decrease by 15-20% in British Columbia in the next five years, resulting in both production reductions and the permanent closure of sawmills in the province.

Note: The statistical annex of the Forest Products Annual Market Review 2018-2019 is available at: www.unece.org/forests/fpamr2019-annex

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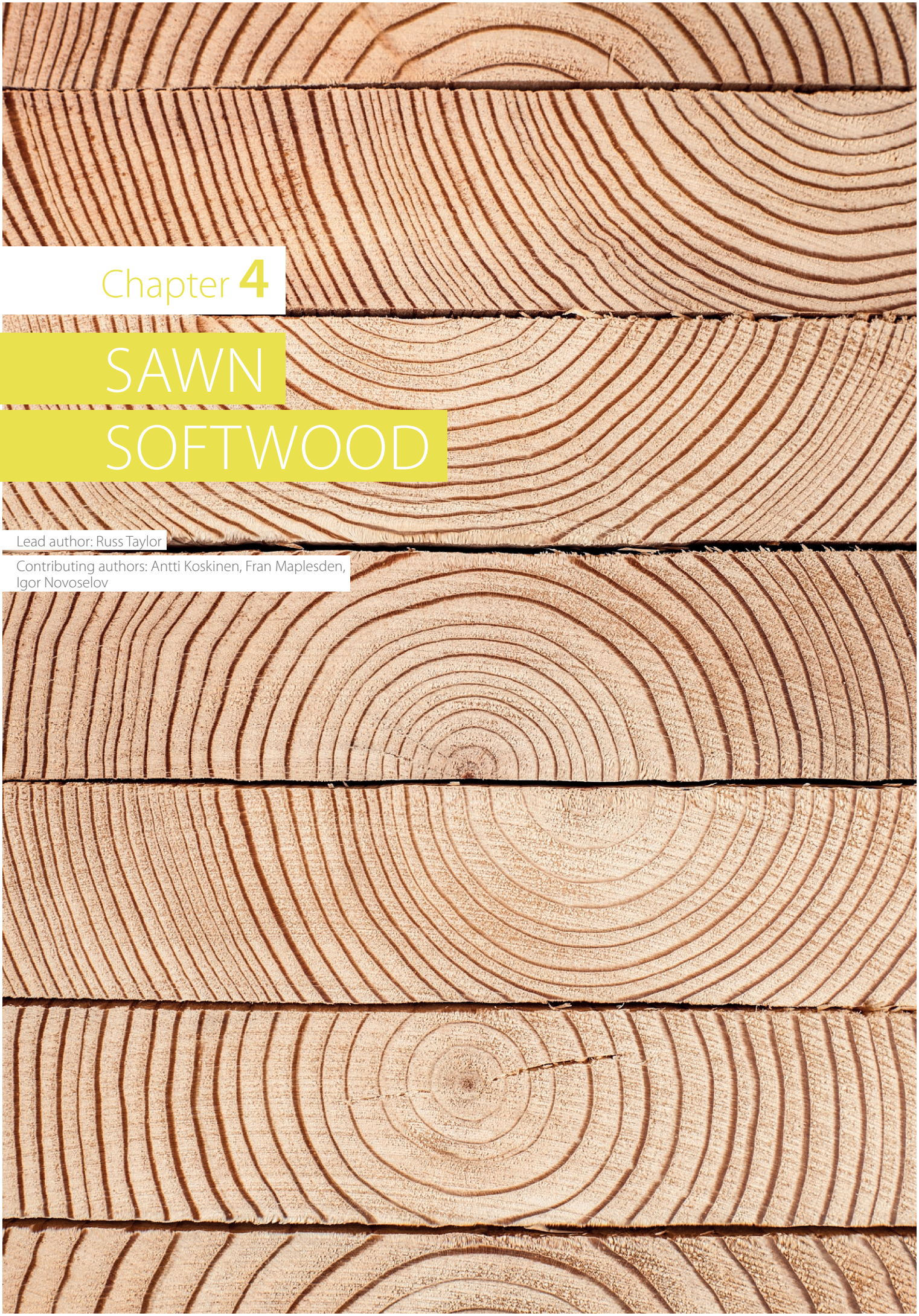

Chapter 4

SAWN SOFTWOOD

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Highlights

The three UNECE subregions recorded mixed results in the consumption of sawn softwood in 2018, with Europe rising by 2.6%, North America up by 1.0% and the CIS down by 0.5%.

Sawn softwood production increased in all three UNECE subregions in 2018 – by 1.7% in Europe, 7.1% in the CIS and 0.8% in North America.

Sawn softwood production increased by 4.4% in the Russian Federation in 2018, to 39.4 million m^3, which was more than 82% of the CIS subregion's output (47.0 million m^3).

Exports of Russian sawn softwood set a new volume record in 2018 of 29.8 million m^3, up by 6.2% over 2017. Export growth was due largely to China, which was the largest consumer of Russian sawn softwood (58% market share of exports) in 2018, at 17.3 million m^3.

Europe's sawn softwood production increased by 1.7% in 2018, to 112.5 million m^3, with notable gains in central Europe, partly from timber salvage programmes. Austria contributed the highest increase in European production in 2018, with an additional 0.54 million m^3 (+5.6%), followed by Turkey (+5.5%) and Germany (+2.5%).

European sawn softwood exports grew by 0.2% in 2018, to 51.9 million m^3. The increase was driven by growing intraregional exports in Europe, with demand declining in China and Japan.

European exports to the Middle East and North Africa increased by 3.6% in 2018 after a sharp decline in 2017.

US housing starts increased by 3.9% in 2018, but a slowing trend was evident in the second half of 2018 and first half of 2019. The apparent consumption of sawn softwood increased by only 0.8% in the US in 2018, to just over 82 million m^3.

The US output of sawn softwood grew by 3.2% in 2018, to 59.5 million m^3, but Canadian sawn softwood production dropped by 2.3%, to 45.2 million m^3. Import duties averaging 20.2% on shipments to the US, coupled with a slowdown in China, led to a series of short-term Canadian mill curtailments that were still occurring in the second quarter of 2019.

Canadian shipments of sawn softwood to the US declined by 4.8% in 2018, to 23.3 million m^3, despite soaring prices in the first half of the year. Canada's overseas exports also declined – by 4.7%, to 6.6 million m^3.

European exports of sawn softwood to the US leapt by about 50% in 2018, to 2.0 million m^3; however, weaker prices in the first half of 2019 slowed shipments by 10%, year-on-year.

4.1 Introduction

The three UNECE subregions recorded mixed results in the consumption of sawn softwood in 2018. The recovery continued in North America for the ninth consecutive year, with sawn softwood consumption increasing by 1.0%, although it slowed in the second half of 2018 and into 2019. Consumption increased by 2.6% in Europe in 2018 and decreased by 0.5% in the CIS (table 4.1.1). Sawn softwood production grew by 1.7% in Europe, 0.8% in North America and 7.1% in the CIS (led by the Russian Federation's 4.4% gain, to 39.4 million m^3, which was more than 82% of the CIS subregion's output.).

TABLE 4.1.1

Apparent consumption of sawn softwood in the UNECE region, by subregion, 2017-2018 (thousand m^3)

	2017	*2018*	*m^3/capita (2017)*	*Change (%) 2017-2018*
Europe	97,395	99,893	0.16	2.6
CIS	16,580	16,493	0.06	-0.5
North America	97,571	98,498	0.28	1.0
Total	**211,546**	**214,884**	**0.17**	**1.6**

Source: FAOSTAT, 2019.

4.2 Europe

4.2.1 Consumption

The European market showed steady growth in 2018, with consumption rising to 99.9 million m^3; it is expected to ease in 2019, however, (table 4.2.1).

The major consuming countries in Europe had mixed performances in 2018. Consumption increased by 0.8% in Germany, the largest sawn softwood market in Europe, to a record 19.5 million m^3. The UK is the second-largest consuming country in Europe but, after two years of remarkable growth, consumption there dropped by 7.6% in 2018, to 9.8 million m^3. Consumption was flat in France, at 8.2 million m^3.

The Baltic states are importing increasing quantities of sawn softwood from other European countries and the Russian Federation. Estonia has the highest sawn softwood consumption per capita in Europe, and Latvia is number three behind Austria.

TABLE 4.2.1

Sawn softwood balance, Europe, 2017-2019 (thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	110,577	112,498	112,054	1.7
Imports	38,611	39,307	39,351	1.8
Exports	51,793	51,912	52,247	0.2
Apparent consumption	97,395	99,893	99,157	2.6

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

4.2.2 Production and capacity change

Sawn softwood production grew by 1.7% in Europe in 2018, to 112.5 million m^3. The increase was driven more by European demand than by overseas exports, with demand declining in the key markets of China and Japan.

Production increases in central Europe were clearly above European averages, due partly to timber salvage programmes there to harvest trees damaged by storms or beetles. Output from the Nordic mills was more moderate, with production volume steady in Sweden in 2018, at 18.3 million m^3, and Finnish production up by 0.8%, to 11.8 million m^3. The biggest absolute gains in Europe in 2018 were in Germany (+2.5%) and Austria (+5.6%), both up by more than 500,000 m^3, and there was also an increase of more than 300,000 m^3 (+5.5%) in Turkey.

In addition to the large volumes of salvage timber available (beetle attacked, windthrow, etc.), the growth in sawn softwood production in the European subregion in 2018 was due to improved capacity utilization at existing mills and the debottlenecking of production equipment. There were no major greenfield investments or closures in the sawmill industry in Europe in 2018.

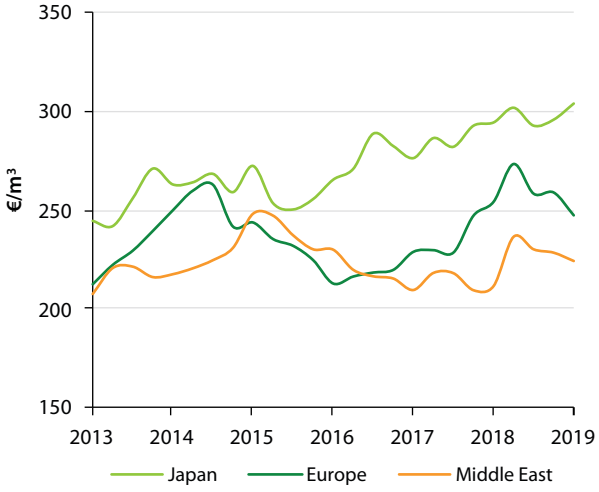
4.2.3 Prices

Prices increased for European sawn softwood in the first half of 2018 in Japan, Europe and the Middle East, but the trend changed in the second half of the year.

The price for Finnish whitewood (cost & freight, C&F) in Europe increased to the middle of the year but declined sharply in

GRAPH 4.2.1

European sawn softwood prices in Japan, Europe and the Middle East, 2013-2019



Notes: Data to March 2019. Japan: European whitewood lamina, KD rough FOB truck port yard. Europe: Finnish whitewood sawfalling, C&F. Middle East: Scandinavian/Baltic whitewood and red pine, sixths, CIF.

Sources: Japan Lumber Report, 2013-2019; Wood Markets, 2013-2019a.

the fourth quarter; nevertheless, it was 12% higher (in euros per m³) in 2018 than in 2017. Prices increased in the Middle East for European sawn softwood but still lagged behind those in Europe (graph 4.2.1). The price for Scandinavian/Baltic sawnwood (cost, freight & insurance; CIF) was up by 6% (in euros per m³) compared with 2017, and the year-on-year price in the first quarter of 2019 was also 6% higher.

The price trend in Japan for European sawn softwood was relatively stable in the local currency (yen) in 2018, although there was a moderate decline in the second quarter; the price was steady thereafter to the first quarter of 2019. Overall, there was a decline of only 1% in 2018 (free-on-board – FOB – truck Japanese port) in euro terms as the yen strengthened. On the other hand, the price was up by 3%, year-on-year, in the first quarter of 2019 (Japan Lumber Report, 2019; Wood Markets, 2013-2019a).

4.2.4 Trade

4.2.4.1 Imports

European imports of sawn softwood increased by 1.8% in 2018, to 39.3 million m³. The clear majority of imports are intra-subregional. Extra-subregional imports originate mainly in Belarus, the Russian Federation and Ukraine. Imports increased from Belarus (by 1.0 million m³) and Ukraine (0.6 million m³). Europe imported a total of about 4.8 million m³ from these two countries in 2018. Imports also increased from the Russian Federation (by 8%), to 3.8 million m³.

The UK, Germany and Italy are the largest importers of sawn softwood in the subregion, accounting for 40% of the total volume. Imports to the UK and Italy declined by 11% and 4.6%, respectively, in 2018 but increased by 6.0% in Germany (Eurostat, 2018-2019).

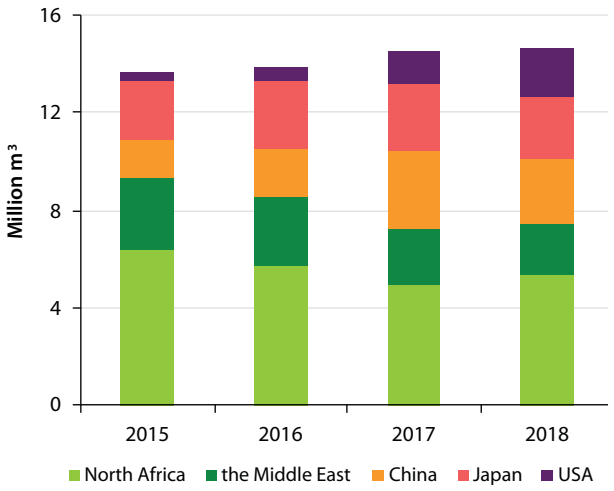
4.2.4.2 Exports

The volume of European sawn softwood exports was steady (+0.2%) in 2018, at 51.9 million m³. There was an increase in intraregional exports within Europe, but demand declined in the key overseas markets of China and Japan. Of the major exporters, volumes increased from Austria and Germany but fell slightly from Finland and Sweden. Central European suppliers had a clear advantage over Nordic producers in lower log prices due to salvaging programmes for timber damaged by storms and beetles.

European overseas exports of sawn softwood show strong regional variation and declined slightly (0.3%) overall in 2018 (graph 4.2.2). Combined exports to the MENA region (Middle East and North Africa) increased by 3.6% in 2018 after a sharp drop in 2017. Exports to Egypt (the largest market in the region) continued to decline, but positive developments in North Africa, including a sharp increase – a near-doubling – in exports to Algeria, compensated for the volumes lost to Egypt and the Middle East. Exports of European sawn softwood to Egypt picked up in the first quarter of 2019 and leapt overall by 20% in North Africa.

GRAPH 4.2.2

Main European sawn softwood overseas export markets, 2015-2018



Source: Comtrade, 2019.

The rapid growth in European exports to China came to an end in 2018. High stock levels combined with declining prices and increased exports from the Russian Federation resulted in a 25% drop in European exports to China compared with 2017, to 2.5 million m^3. Finland and Sweden – the main European exporters – took the hardest hit. This declining trend continued into the first quarter of 2019, with European exporters losing market share to the Russian Federation, despite increased imports to China (Eurostat, 2018-2019).

There was also a substantial drop (-9.4%) in European exports to Japan, to 2.5 million m^3, with only Austria increasing its trade. Japan's overall import volume declined by 6% in 2018, and Europe therefore lost market share to Chile, the Russian Federation and the US. Exports from Europe to Japan were also down (by 5%) in the first quarter of 2019 due to tight market conditions (Eurostat, 2018-2019).

European exports to the US continued to expand rapidly in 2018 (up by 54% to 2.0 million m^3). Half these exports were from Germany, followed by Sweden, Austria and Romania (Eurostat, 2018-2019).

4.3 CIS, with a focus on the Russian Federation

4.3.1 Consumption

Apparent sawn softwood consumption decreased by 0.5% in the CIS subregion in 2018, to 16.5 million m^3 (table 4.3.1).

4.3.2 Production/capacity change

The CIS subregion produced almost 48 million m^3 of sawn softwood in 2018, up by 7.1% over 2017. The Russian Federation made up the majority of this volume, at 39.5 million m^3.

The Russian Federation's harvest of coniferous logs was 238 million m^3 in 2018 (the highest volume since Soviet times). This provided sawmills with a stable log supply. The situation was better in the Russian Northwest than in the Far East. Sawn timber production increased by 10% (to more than 2 million m^3 of total production) in the Arkhangelsk region in 2018 and by 5.8% in the Vologda region (to about 1.6 million m^3). Sawn timber production in the Far East decreased by 1% (down to a total of 1.6 million m^3), however, due mainly to difficulties with raw materials and corporate issues in Vanino and Berezoviy (WhatWood, 2019).

The Government of the Russian Federation approved the "Strategy for the Development of the Forest Industry of the Russian Federation until 2030". It is expected that production will increase by about 75% between the end of 2018 and 2030. Domestic demand for sawn timber is expected to increase by just over 50% between now and 2030. Export markets for sawn softwoods from the Russian Federation are expected to grow by about 25% during the same period, with China the main destination (WhatWood, 2019).

TABLE 4.3.1

Sawn softwood balance, CIS subregion, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	44,574	47,746	47,799	7.1
Imports	5,009	5,037	5,036	0.6
Exports	33,002	36,291	36,692	10.0
Apparent consumption	16,580	16,493	16,143	-0.5

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

Russian sawmills continue to invest in capacity expansion, such as the following:

- The Sudoma Sawmill (Pskov region) increased capacity for brushed sawn timber.
- Cherepovetsles (Vologda region) completed a priority investment project with the construction of a new sawmill with an annual production capacity of 100,000 m^3 of kiln-dried sawn timber annually.
- The Ilim Timber sawmill in Ust-Ilimsk (Irkutsk region) invested in Valutec kilns to increase its drying capacity by about 140,000 m^3 annually.

4.3.3 Prices

The Russian rouble weakened against the US dollar throughout 2018 (down by 7.5%, at 62.7 roubles per dollar). This greatly helped Russian exporters to gain on rouble-based returns, given a reduction in sawn softwood prices in many global markets (WhatWood, 2019).

4.3.4 Trade

Sawn timber exports from the CIS amounted to 36.3 million m^3 in 2018 (up by 10% from 2017), about 86% of which was provided by the Russian Federation.

Exports of sawn softwood from the Russian Federation increased by 6.2% in 2018, to a record high of 29.8 million m^3; nevertheless, this growth was lower than in the previous two years, hampered by difficulties in the Chinese market, high stocks in ports, and lower prices after August 2018.

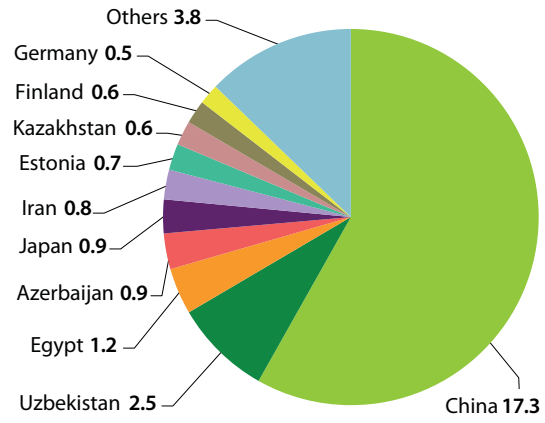
China imported about 58% (17.3 million m³) of the total volume of sawn softwood exported by the Russian Federation in 2018 (graph 4.3.1).

Sales of sawn softwood to Egypt in the last two years have been their lowest for 16 years. Nevertheless, the 1.2 million m³ traded in 2018 was an increase of 6.5% over 2017 (WhatWood, 2019).

Sales of sawn softwood to Europe from the Russian Federation increased by 7.2% in 2018, to 3.7 million m³. Russian exports grew by 13% to Estonia, to 673,200 m³, and by 15% to the UK, to 366,500 m³ (graph 4.3.2).

GRAPH 4.3.1

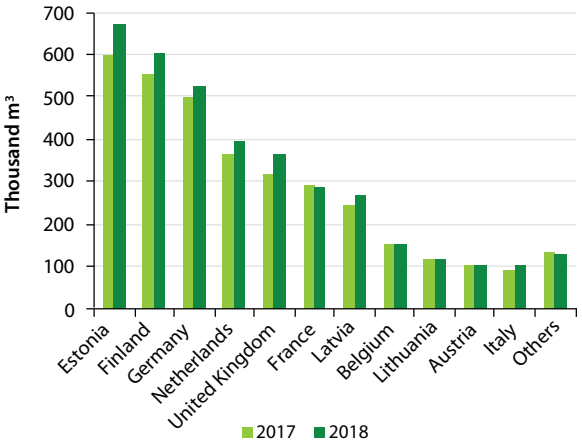
Russian Federation sawn softwood exports, by destination, 2018 (million m³)



Source: WhatWood, 2019.

GRAPH 4.3.2

Russian Federation sawn softwood exports to Europe, 2017 and 2018



Source: WhatWood, 2019.

4.4 North America

4.4.1 Consumption

North American sawn softwood markets started to ease in the second half of 2018, and demand barely grew in the first half of 2019, mainly a function of slowing US housing starts. A portion of this slowing was weather-related, with exceptionally cold or wet weather the norm since the fourth quarter of 2018. US housing starts were 1.25 million units in 2018, an increase of 3.9% over 2017 (US Census Bureau, 2019). Single-family housing grew by 3.2%, and the increase in multifamily starts was even higher, at 5.7%. With a very slow start to 2019, indications are that there will be about the same number of housing starts in 2019 as in 2018. Mortgage interest rates are lower, average incomes are growing at 3.5-4%, unemployment is at generational lows, and new-home sales are on the rise.

US residential improvement expenditures (an even larger driver of lumber demand than housing) slowed in 2018, despite an ageing US housing stock. The outlook is more positive for 2019, given low interest rates and pent-up demand.

The US economic outlook is relatively healthy, with GDP growth in 2019 expected to be similar to that in 2018 (2.9%), although the trade dispute with China could lead to a poorer result if not solved promptly (Forest Economic Advisors LLC, 2019). Apparent North American sawn softwood consumption was 98.5 million m³ in 2018, up by 1.0% from 2017 (table 4.4.1), comprising 82.1 million m³ in the US (up by 0.8%, year-on-year) and 16.4 million m³ in Canada (up by 1.6%).

TABLE 4.4.1

Sawn softwood balance, North America, 2017-2019 (thousand m³)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	103,892	104,686	106,758	0.8
Imports	27,624	26,349	27,159	-4.6
Exports	33,946	32,536	33,989	-4.2
Apparent consumption	97,571	98,498	99,929	1.0

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

4.4.2 Production/capacity change

US sawn softwood output was 59.5 million m^3 in 2018, up by 3.2% over 2017. Production gains were highest in the US West (+4.3%), followed by the US South and the Midwest/Northeast (both +2.4%). The ongoing depressed prices for standing timber in the US South are a result of excess and unused growing stock. The US South accounts for more than 55% of US sawn softwood production and continues to achieve the highest earnings in North America (Forest Economic Advisors LLC, 2019).

Canadian sawn softwood production was 45.2 million m^3 in 2018, a decline of 2.3% from 2017. All regions were hit by high purchaser inventories, slowing demand and slumping prices in the second half of 2018. Moreover, import duties on shipments to the US and a slowdown in China started a series of short-term mill curtailments that were still occurring in the second quarter of 2019. Production in the British Columbia Interior – Canada's leading region for sawn softwood production (accounting for 40% of national production in 2018) – declined by 5.2% in 2018 (Statistics Canada, 2019). Output in the rest of Canada also decreased, except for gains in the smaller producing regions of Ontario and Atlantic Canada.

Permanent import duties averaging 20.23% (the "all others" rate) on Canadian lumber exported to the US became effective in late December 2017 (preliminary duties were retroactive, starting from late January 2017) (US Department of Commerce, 2018).

4.4.3 Prices

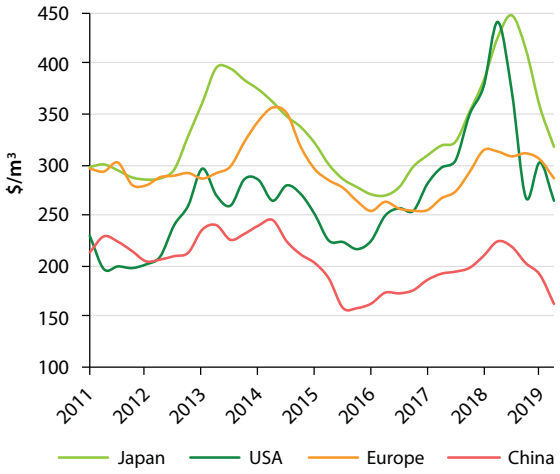
The price of softwood lumber in the US market (as measured by the Random Lengths framing lumber composite price index) peaked in early June 2018 at an all-time high of $582 per thousand board feet ($365 per m^3, net count) (Random Lengths, 2019). Forest fires, logistics disruptions and cold weather in western North America interacted with other events, leading to lumber shortages in the first half of 2018 followed by excessive field inventories in the second half of the year. In the fourth quarter of 2018, and again in the second quarter of 2019, prices fell to well below costs for some regions, at close to $300 per thousand board feet ($190 per m^3).

Sawn softwood prices declined in the fourth quarter of 2018 as a result of oversupplied export markets. Canadian SPF ("spruces, pines and firs") prices plunged by 25% in some markets (e.g. China) between the third quarter of 2018 and the second quarter of 2019.

Japanese prices for imported North American lumber rose to record levels in the second quarter of 2018, in parallel with soaring US prices. From their peak in mid-2018, however, prices had fallen by 28% by the second quarter of 2019. In contrast, prices paid in Japan for European exports were relatively flat over the same period (graph 4.4.1).

GRAPH 4.4.1

Quarterly prices for sawn softwood in China, Europe, Japan and the US, 2011-2019



Notes: Data to June 2019, delivered-to-market prices. Japan: BC W-SPF 2x4, J-grade, C&F; Europe: Swedish spruce 47x100, C&F; US: W-SPF grade #2&Btr, 2x4, delivered to Chicago; China: SPF/Hem-Fir, green, grade #3&Btr 1-7/8x4-12, C&F.

Sources: Wood Markets, 2013-2019a; Wood Markets, 2013-2019b.

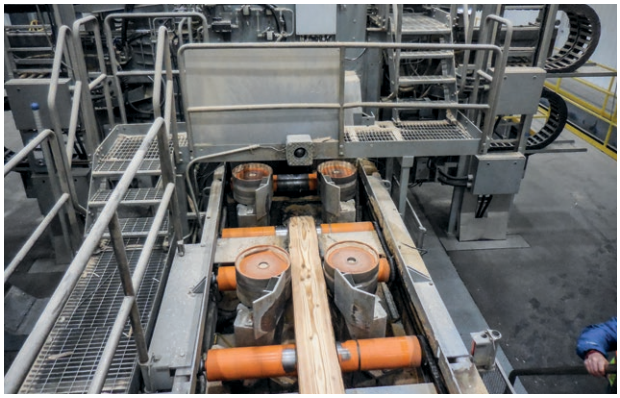
4.4.4 Trade

The countervailing and antidumping duties on Canadian exports to the US had a negative impact on Canadian producers from the second half of 2018 through the first half of 2019. The application of import duties coupled with low lumber prices have caused Canadian sawmills to curtail production. Canadian exports to China increased to offset low returns to the US, but slowing demand and soaring inventories there caused prices to plummet to levels well below cost. This is creating opportunities for US producers to make up the shortfall, but, as part of the China-US trade dispute, Chinese import duties have increased to 20-25%, essentially eliminating much of the US's exports to China. European exporters are looking to replace Canadian volumes in the US and North American volumes in China.

Japan's sawn softwood imports from all countries decreased by 0.8% in 2018, to 6.2 million m^3. North American exports to Japan declined by 1.8% (to 2.1 million m^3).

4.4.4.1 Imports

The US imported 25.5 million m^3 of sawn softwood in 2018, down by 4.5% from 2017. Canada continued to dominate US imports, with a 91% share in 2018. Canadian shipments to the



US were 23.3 million m^3 declined by 4.8% in 2018, despite very high US sawnwood prices in the first three quarters of 2018. Low US prices from the fourth quarter of 2018 to mid-2019 caused production curtailments. US imports from Europe soared to 2.0 million m^3 in 2018, up from 1.3 million m^3 in 2017, but were almost 10% lower in the first quarter of 2019 than in the same quarter the previous year due to lower prices (Wood Markets, 2013-2019a).

4.4.4.2 Exports

US sawn softwood exports increased by just 0.4% in 2018, to 3.9 million m^3, with the largest volumes directed to Canada, China and Mexico. US exports were almost 20% lower in the first quarter of 2019, year-on-year, due in part to the China-US trade dispute (Wood Markets, 2013- 2019a).

Canadian sawn softwood exports to all overseas markets declined by 4.7% in 2018, to 6.6 million m^3. There were increases in shipments only to Australia and Taiwan Province of China – all other major markets recorded declines.

Total Canadian exports were 15% lower in the first three months of 2019, year-on-year, with significant declines to the Republic of Korea (-17%), Europe (-15%) and the US (-5%).

The general oversupply and high inventories in many key export markets reduced shipments in the first half of 2019. All major exporting countries are looking for markets to ship incremental sawnwood, so curtailments or a spike in demand will be required to enable markets to re-establish a balance.

4.5 Extra regional influences affecting the UNECE region

Outside the UNECE region, China dominates sawn softwood imports (table 4.5.1). Its import volume grew strongly in 2017 and declined slightly to 24.9 million m^3 in 2018. China's sawn softwood imports are destined mainly for the housing and construction market, which continued to grow strongly in 2018. Investment in real estate development increased by 9.5%, although the pace of growth slowed in the second half of the year (National Bureau of Statistics of China, 2018). The increase in residential housing starts occurred despite government efforts to reduce property speculation following concerns that the property market was overheated. Although many top-tier Chinese cities and government agencies introduced measures to curb the pace of growth, real estate development continued to grow nationally as investments transferred to lower-tier cities, prompting concerns about the high proportion of unoccupied houses.

Slower economic growth is forecast in China in 2019, with manufacturing slowing in small and medium-sized enterprises in the first quarter and an expectation that growth will continue to be affected by the China-US trade dispute. Despite the anticipated slowdown, construction activity may be boosted in 2019 by government plans to counter the economic slowdown by boosting spending, increasing foreign firms' access to Chinese markets, cutting taxes and company fees, and reducing value-added tax for the transportation and construction sectors.

China's imports of sawn softwoods in 2018 were predominantly from UNECE sources, particularly the Russian Federation (about 60% by volume) and Canada (17%), with the Russian Federation's exports increasing by 10%, year-on-year, to reach record heights. Brazil, Chile and New Zealand were the only significant competitors outside the UNECE region.

Japan's volume of sawn softwood imports was little changed in 2018; this followed the trend in housing starts, which declined by 2% in 2018. Housing demand is being driven partly by a planned rise in the consumption tax in October 2019, which is expected to increase the purchase cost of housing. A range of measures have been introduced to incentivize customers to purchase houses after the introduction of the tax in an effort to mitigate an expected pre-tax surge in housing demand (ITTO, 2019a).

Japan's sawn softwood imports in 2018 were overwhelmingly from North American and EU sources, with demand affected by rising prices of imported sawnwood, shortages of supply from the US, and the increasing availability of low-cost domestic species.

The only significant exporters of sawn softwoods outside the UNECE region in 2018 were Chile, Brazil, New Zealand and Australia (in descending order, by volume). Chile's export markets are diversified, with significant volumes shipped to Asia, Latin America and the Middle East. Brazil's exports of sawn softwoods continued to increase strongly in 2018 in response to sustained sawn softwood demand in the US, the major export market. New Zealand's major markets in 2018 were predominantly within the Asia-Pacific region – China, the US, Australia, Viet Nam, Thailand and the Republic of Korea (in descending order, by volume).

TABLE 4.5.1

Major importers and exporters of sawn softwoods outside the UNECE region, 2016-2018 (thousand m^3)

	2016	*2017*	*2018*	*Change (%) 2017-2018*
MAJOR IMPORTERS				
China	21,584	25,046	24,880	-0.7
Japan	6,099	6,124	6,106	-0.3
Egypt	4,390	3,986	n/a	n/a
Republic of Korea	1,942	1,471	1,870	27.1
Mexico	1,560	1,588	1,499	-5.6
MAJOR EXPORTERS				
Chile	3309	3659	4,075	11.4
Brazil	1,813	2,281	2,374	4.0
New Zealand	1,731	1,824	1,940	23.7
Australia	270	244	149	-38.9

Sources: Comtrade, 2019; ITTO, 2019b; China Customs, 2019.

4.6 Policy and regulatory influences on the sector

The nine-year US–Canada Softwood Lumber Agreement expired in mid-October 2015. Based on US trade law procedures, the US Department of Commerce initiated preliminary countervailing and antidumping duties in early 2017. Final duties (five companies received specific duties, and the "all others" rate was 20.23%) commenced in late December 2017.

The China-US trade dispute reached a new level of tension when the US was matched by China in imposing higher tariffs of 20-25% on most forest products.

Efforts continue in North America to promote wood as a building material of choice. The role of the Softwood Lumber Board (SLB) is to strengthen and diversify demand for softwood lumber. Since its inception in 2012, the SLB has created more than 4.8 billion board feet (8.2 million m^3) of new demand and resulted in an increase of $1.9 billion of revenue. SLB initiatives continue to increase wood use (including cross-laminated timber) in taller/larger apartment and non-residential buildings, and they are attracting interest in North America and worldwide. Such initiatives should lead to further increases in North American sawnwood consumption.

In Europe, Brexit is the most significant policy issue with potential to affect sawn softwood, especially UK imports from the EU. Of the EU countries, the UK is second only to Germany for imports of forest products (by value). The impacts of Brexit on sawn softwood producers in the EU will depend on the terms of the exit and on changes to the exchange rate between the pound sterling and the euro.

Note: The statistical annex of the *Forest Products Annual Market Review 2018-2019* is available at: www.unece.org/forests/fpamr2019-annex

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Chapter 5

SAWN HARDWOOD

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Highlights

The consumption of sawn hardwood in the UNECE region was relatively flat overall in 2018, at 35.8 million m^3, although there was a big jump (+16%) in the CIS.

Sawn hardwood production was also almost unchanged overall in the UNECE region in 2018, at 42.7 million m^3, with slight declines in Europe and North America and a significant rise (10.5%) in the CIS.

Of Europe's top five producers of sawn hardwood (Croatia, France, Germany, Romania and Turkey), only Germany showed an increase in production (+1.4%) in 2018. There was a drop of almost 9% in the largest producer, Turkey.

Sawn hardwood markets in the UNECE region continue to be influenced by hardwood furniture producers in the Asia-Pacific region. The sawn hardwood industry faces a number of challenges, however, including a trend towards low-cost flat-packed furniture made of less-expensive non-hardwood materials.

Despite a wide range of hardwood species in Europe and North America, producers continue to favour oak to match the demand of consumers. Birch accounts for the largest share of production, consumption and exports in the CIS, however.

The Russian Federation is the leading producer of sawn hardwood in the CIS. Most of the country's production is in the west, but Siberia and the Far East account for 40% of Russian production.

Exports of sawn hardwood from the Russian Federation to China amounted to 1.45 million m^3 in 2018, an increase of 14% over 2017.

In North America, sawn hardwood consumption increased by 1% in 2018 across all sawn hardwood sectors, including appearance (furniture, cabinets, millwork and flooring), industrial (pallets and sleepers) and other (staves, structural building products, etc.).

Despite a growing economy and positive movement in the production of hardwood office furniture, combined sawn hardwood consumption by all industries in the US furniture subsector declined by an estimated 0.5% in 2018.

Prices for North American sawn hardwood appear to be waning for high-grade products but increasing for the lower industrial grades, such as pallet stock and railroad ties (sleepers).

US exports of hardwood lumber to China fell away dramatically in late 2018 and early 2019 as China implemented retaliatory tariffs in response to tariffs imposed by the US on exports from China.

The tropical sawn hardwood trade continues to be dominated by the Asian region, with China and, to a lesser extent, Thailand and Viet Nam the major importers and Thailand, Malaysia, Gabon and Cameroon the major exporters.

5.1 Introduction

Sawn hardwood consumption and production in the UNECE region continues to stagnate, despite relatively good economic conditions in most of the region in 2018.

Exports of sawn hardwood outstrip imports in all three UNECE subregions, and overall the region exports about double the volume it imports. The single biggest export destination for sawn hardwood exporters is China. The trade dispute between China and the US is having a significant impact on the US hardwood industry and could potentially affect established sawn hardwood trade flows globally.

The sawn hardwood industry faces a number of headwinds in the UNECE region, including an increasing consumer preference for inexpensive home furnishings and cabinetry made from composite wood products and non-wood materials (away from traditional hardwood furniture).

5.2 Europe

5.2.1 Consumption

The apparent consumption of sawn hardwood in Europe declined by 1.4% in 2018, to 13.1 million m^3 (table 5.2.1). The subregion's largest national market for sawn hardwood, Turkey, decreased by 9.3% due the economic downturn there. (FAOSTAT, 2019).

TABLE 5.2.1

Sawn hardwood balance, Europe, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	14,595	14,303	14,330	-2.0
Imports	5,055	5,080	5,184	0.5
Exports	6,347	6,262	6,425	-1.3
Apparent consumption	13,303	13,120	13,089	-1.4

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

European furniture consumption – another important source of sawn hardwood demand – grew by 2% in 2018 in the main markets of France, Germany, Poland, Spain and the UK. Europe continues to lose market share to Asia, however, in both production and consumption. Furniture production in the Asia-Pacific region more than doubled between 2008 and 2017 (from $122 billion to $239 billion), a period in which changes in other world regions were comparatively small. As a result, more than half the global furniture production took place in the Asia-Pacific region in 2017 (CSIL, 2018).

Another aspect affecting hardwood furniture demand (as discussed in last year's *Review*) is the general trend in Europe (and elsewhere in the UNECE region) away from traditional hardwood-based furniture to low-cost flat-pack furniture, which is often made of composite panels (particleboard or fibreboard), sawn softwood or other materials (Shriver, 2018; Schwarz, 2018). The temporary nature and affordability of flat-packed furniture is accommodating societal shifts toward more frequent household moves and style changes.

The parquet (wooden flooring) industry in Europe is an important consumer of European hardwoods. Parquet consumption in the EU declined by about 2% in 2018 after three years of modest growth. The largest European market for parquet is Germany (accounting for almost one-fifth of consumption in the EU). Production in Europe also declined by just over 1%. Poland is the largest producer, followed by Sweden, Austria and Germany (FORDAQ, 2018).

The outlook for parquet consumption in 2019 and 2020 is generally positive. Oak continues to be the species of choice for parquet, accounting for more than 80% of the surface wood used for parquet production (European Federation of the Parquet Industry, 2019).

5.2.2 Production and capacity change

European hardwood lumber production contracted by 2% in 2018, to 14.3 million m^3. Production in Turkey dropped by 8.8%, to 2.3 million m^3, and this was the main contributor to the decline in European production (graph 5.2.1) (FAOSTAT, 2019). The supply of raw materials at a cost that allows profitability continues to be a problem for hardwood sawmills in Europe, and this is exacerbated by a strong dependence on European oak and competing demand from Asia for raw materials.

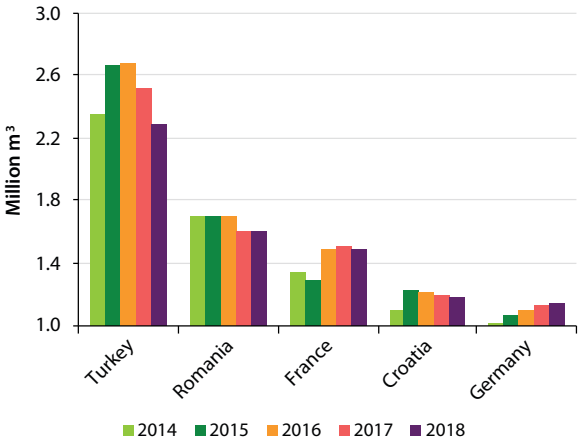
Graph 5.2.2 provides an overview of the main export destinations of hardwood logs outside the EU, showing the strong and increasing role of Viet Nam and especially China. This is a concern for European sawmills because competition by wood traders for overseas markets drives up demand and thus prices. It should be noted, however, that Europe exports far more sawn hardwood volume than log volume outside the EU (Comtrade, 2019).

5.2.3 Prices

Prices for oak sawnwood and logs increased in 2018 and into 2019. Prices for oak sawlogs have increased at twice the rate as those for sawn timber in the last three years, squeezing margins for producers. Domestic and overseas demand for

GRAPH 5.2.1

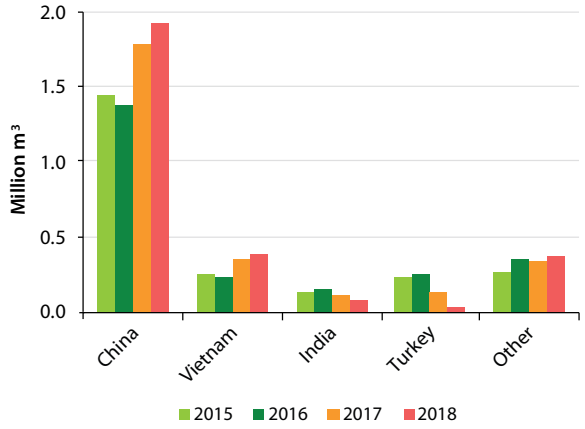
Top five countries in Europe, non-coniferous sawnwood production, 2014-2018



Source: FAOSTAT, 2019.

GRAPH 5.2.2

EU hardwood log exports by destination, 2015-2018



Note: Converted from tonnes (mt) using the conversion factor 1 mt = 0.91 m³.

Source: Eurostat, 2019.

oak, as well as export prohibitions in Europe and the CIS (e.g. Ukraine and Croatia) have driven the increase in log prices (FAOSTAT, 2018 and ITTO, 2018).

5.2.4 Trade

5.2.4.1 Imports

Total imports of sawn hardwood by European countries were almost flat in 2018, at about 5.1 million m³. Italy, the UK and Belgium (in descending order, by volume) continue to be the largest importers of sawn hardwood in Europe.

5.2.4.2 Exports

Europe's hardwood lumber exports were down by about 1.3% in 2018, to 6.3 million m³. Croatia was easily the largest exporter of sawn hardwood in Europe, shipping out just over 1 million m³ in 2018. Significant declines were recorded in Romania (down by 12.3%, to 564,000 m³) and Germany (-4.9%, to 771,000 m³) (FAOSTAT, 2019).

5.3 The CIS subregion

5.3.1 Production and consumption

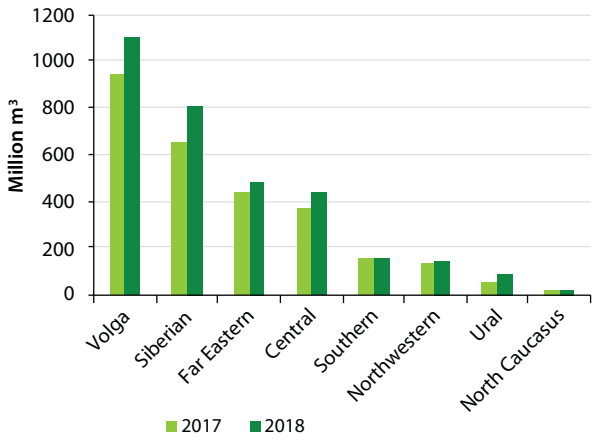
According to WhatWood, sawn hardwood production in the CIS increased by 10.5% in 2018, to 4.2 million m³, and consumption increased by 16.0%, to 1.7 million m³ (table 5.3.1) (WhatWood, 2019). The Russian Federation produced 3.2 million m³ of sawn hardwood in 2018, an increase of 16.1% over 2017. The majority of this was produced in the Volga district, followed by Siberia and the Far Eastern districts (graph 5.3.1).

5.3.2 Prices

Weighted average export prices for sawn hardwood in the Russian Federation in 2018 were 8,563 roubles ($133), an increase of 10% over 2017 (graph 5.3.2).

GRAPH 5.3.1

Production of sawn hardwood, by federal district, Russian Federation, 2017-2018



Source: WhatWood, 2019.

TABLE 5.3.1

Sawn hardwood balance, CIS, 2017-2019
(thousand m^3)

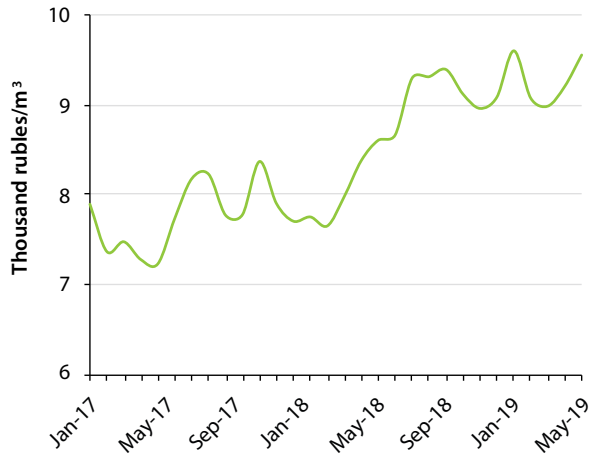
	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	3,769	4,164	4,333	10.5
Imports	111	108	107	-2.4
Exports	2,419	2,578	2,732	6.6
Apparent consumption	1,461	1,695	1,708	16.0

Note: f = 2017 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

GRAPH 5.3.2

Monthly prices for sawn hardwood exports, Russian Federation, 2017-2019



Note: Tonnes (mt) converted to m^3 using 1.5 m^3 = 1 mt

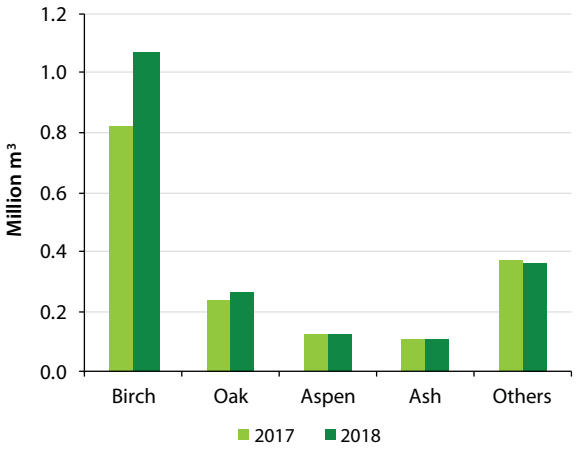
Source: Trade Data Monitor.

5.3.3 Trade

Sawn hardwood exports from the CIS amounted to 2.6 million m^3 in 2018 (an increase of 6.6% over 2017), of which 1.9 million m^3 was from the Russian Federation (up by 14% over 2017). The Russian Federation exported 1.45 million m^3 of sawn hardwood to China in 2018, an increase of 14% over 2017 and the largest quantity of Russian sawn hardwood ever shipped to China. Birch is the dominant species exported from the Russian Federation (graph 5.3.3) (WhatWood, 2019).

GRAPH 5.3.3

Sawn hardwood exports, Russian Federation, 2017-2018



WhatWood, 2019.

5.4 North America

5.4.1 General overview

North American sawn hardwood consumption increased by 210,000 m^3 (1%) in 2018 (table 5.4.1), and production was flat (at 24.3 million m^3). Sawn hardwood imports increased by 298,000 m^3 (19.1%) in 2018 and exports grew by 30,000 m^3 (0.6%). US exports were stable in the first half of 2018 but declined in the third and fourth quarters. The fall caused prices of higher-quality hardwood sawn products used in appearance applications (e.g. cabinets, furniture, millwork and flooring) and exports to trend downward in the second half of 2018 through the first half of 2019 (USDA Foreign Agricultural Service, 2019).

Housing starts in the US continued to increase in 2018, rising by 3.9%. Single-family starts grew by 3.2% and multifamily units by 5.7% (US Census Bureau, 2019). These increases are expected to result in incremental increases in North American sawn hardwood consumption by the housing industry in 2019. Larger quantities of appearance-grade sawn hardwood are consumed in the manufacturing of cabinet, flooring and millwork for single-family units than for multifamily units.

5.4.2 Consumption

The increase in North American apparent sawn hardwood consumption was modest in 2018, at 1.0%. US consumption increased slightly across all application sectors (graph 5.4.1), including appearance, industrial (pallets and sleepers) and other (staves, structural building products, etc.). Industrial

TABLE 5.4.1

Sawn hardwood balance, North America, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	24,343	24,284	24,318	-0.2
Imports	1,564	1,863	1,865	19.1
Exports	5,086	5,115	5,214	0.6
Apparent consumption	20,822	21,032	20,968	1.0

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

products had the largest increase (1.5%). The consumption of sawn hardwood by US construction-related industries increased by 1.4% in 2018, down from 2.0% in 2017.

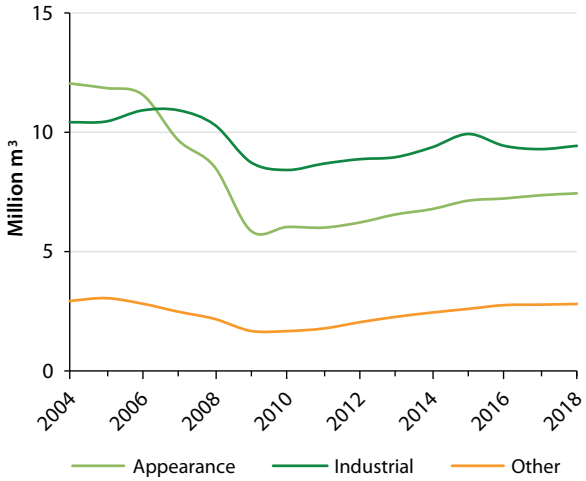
The consumption of sawn hardwood in the higher-value appearance applications is relatively low, accounting for less than 40% of US domestic consumption in 2018. Within the appearance sector, the US non-upholstered wood household furniture industry has had the largest volumetric decline (1.9 million m^3) in consumption since 2004. In contrast, the US wood office and institutional furniture industries have partially rebounded from 2009 levels to become the most important component of the US furniture industry. Nevertheless, sawn hardwood consumption by all industries combined in the furniture subsector declined by an estimated 0.5% in 2018 (Luppold and Bumgardner, 2016, 2017 and 2019 unpublished).

5.4.3 Prices

The price of sawn hardwood used in appearance applications is reflected in the movement of the multi-species or aggregate price index of mid-grade Number 1 Common

GRAPH 5.4.1

US sawn hardwood consumption by segment, 2004-2018



Source: Luppold and Bumgardner, 2019 (unpublished data).

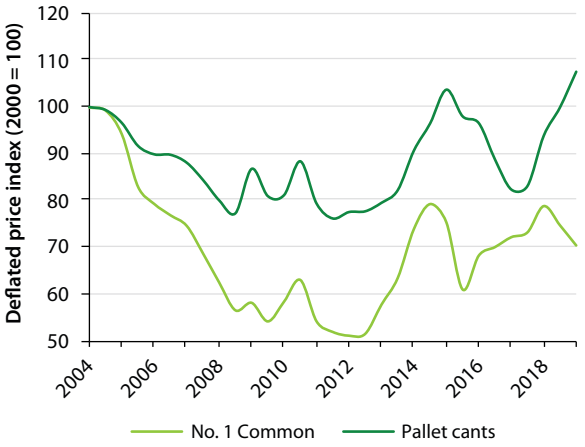
boards (1C) shown in graph 5.4.2; prices of sawn hardwood used in industrial applications are represented in the graph by the pallet cants price index. The 1C price index declined by 50% between 2004 and 2012, the largest decline recorded in North America since the Second World War; it was also the most prolonged period of declining prices (eight years). The decline in the 1C price between 2004 and 2009 was the result of declining consumption of appearance-grade sawn hardwood (depicted in graph 5.4.1). The decline between 2010 and 2012 was the result of a liquidation of sawn hardwood inventories by sawmills and secondary hardwood product manufacturers, which were forced out of business as a result of the Great Recession.

The aggregate price of 1C lumber began to climb after 2012 as a result of stable domestic consumption and an increase in exports. The downward movement of 1C price in 2016 appears to have been a normal cyclical adjustment due to temporary overproduction. The decline in price in the second half of 2018 was associated with a large decline in exports in the corresponding period (Luppold and Bumgardner, 2019, unpublished).

Historically, pallet cants and sleepers are manufactured from the centres of logs, the outer parts of which provide higher-value boards used for appearance applications. When prices of sawn hardwoods used in appearance applications decline, so too does the supply of pallet cants produced in conjunction with these products. Industrial materials can also be manufactured from lower-quality (and lower-cost) logs that yield little or no appearance-grade products. Mills

GRAPH 5.4.2

Inflation-adjusted price indices for sawn hardwood product grades, 2004 to first half 2019



Note: Deflated by the US producer price index (US Bureau of Labor Statistics, 2019).

Source: Hardwood Market Report (2004-2019); US Bureau of Labor Statistics, 2019.

designed to process these low-quality logs normally differ, however, from mills designed to cut higher-quality logs.

As indicated in graphs 5.4.1 and 5.4.2, sawn hardwood consumption and prices for industrial products declined moderately between 2004 and 2008 and were relatively flat between 2008 and 2012. The price spike in 2015 coincided with a peak in industrial consumption, and the moderate price decline in 2016-2017 coincided with declining consumption. The upward movement in the price of pallet cants after 2017 was a result of insufficient supply relative to demand, with total sawn hardwood production declining (table 5.4.1).

5.4.4 Trade

5.4.4.1 Imports

Historically, North American sawn hardwood imports have been heavily influenced by bilateral trade between Canada and the US. The US primarily imports aspen and maple from Canada and exports a variety of temperate species, such as red oak, white oak and yellow poplar. In 2004, 47% of US imports on a value basis were from Canada and 94% of Canadian imports were from the US. Between 2004 and 2018, Canadian imports of sawn hardwood declined by 68% in volume and 39% in value, although 94% of the total (value basis) continued to originate from the US in 2018. During the same period, the volume of US sawn hardwood imports declined by 51% and the value of imports declined by 23%, while imports from Canada declined by nearly 70% in volume and 50% in value. The decline in US imports from Canada reflects decreased US demand for sawn hardwood for appearance and industrial applications (USDA Foreign Agricultural Service, 2019; Statistics Canada, 2019).

More than 50% of the value of US sawn hardwood imports were tropical species in 2018, with the value of these imports increasing by 15% between 2004 and 2018. On a volume basis, balsa continues to be the most important tropical species imported into the US, with 22% market share in 2004 and 23% in 2018. In value terms, mahogany was the most important species imported in 2004, with 27% of market share, but ipê comprised nearly one-third of the value of tropical imports in 2018. Mahogany is an important tropical species used in the declining US furniture industry. Ipê is used in outdoor decking and docks because it is naturally rot- and termite-resistant, but it is a relatively expensive substitute for pressure-treated softwood, with an imported price of $2,367 per m^3 in 2018 (Luppold and Bumgardner, 2019, unpublished).

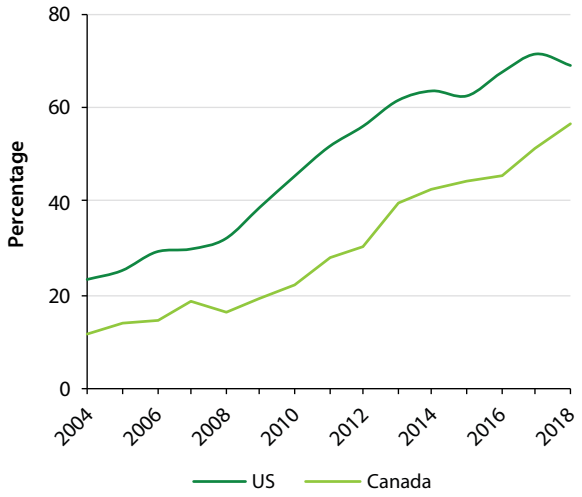
5.4.4.2 Exports

North American sawn hardwood exports were flat in 2018, the result of decreased US and Canadian shipments. US exports to China declined by 16% (nearly 390,000 m^3) and exports to Mexico decreased by 9%. US exports to Europe and Canada were relatively unchanged in 2018, but exports to Viet Nam increased by nearly 56,000 m^3 (13%) (USDA Foreign Agricultural Service, 2019; Statistics Canada, 2019).

North American exports to China, Hong Kong SAR, and Viet Nam ("CHKV" for the combined market region) are interlinked. In the early 2000s, China, Hong Kong SAR was used as a trans-shipment point for sawn hardwood going into China. Exports to Viet Nam increased In the late 2000s as the Chinese bedroom furniture industry relocated there after a trade dispute with the US. Since 2004, the value of sawnwood exports from the US and Canada to CHKV increased by 540% and 335%, respectively. In 2018, 69% of US exports and 56% of Canadian exports excluding bilateral trade went to CHKV (graph 5.4.3).

GRAPH 5.4.3

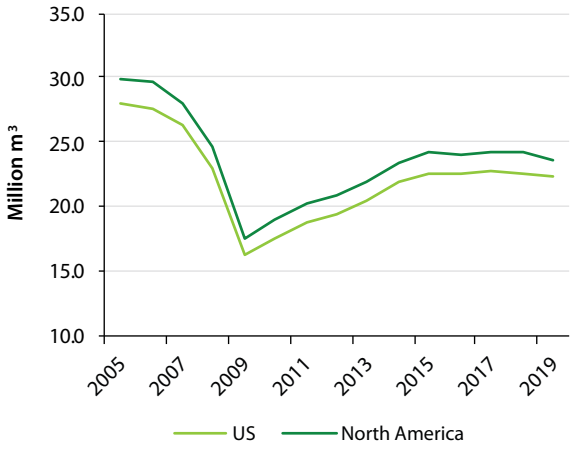
Percentage of US and Canadian sawn hardwood exports (excluding bilateral trade) going to China, Hong Kong SAR, and Viet Nam, value basis, 2004-2018



Source: USDA Foreign Agricultural Service, 2019; Statistics Canada, 2019.

GRAPH 5.4.4

US and North American production of sawn hardwood, 2005-2019



Source: Luppold and Bumgardner, 2019 (US, Unpublished); FAOSTAT, 2019 (Canada).

5.4.5 Production and capacity charges

Total North American sawn hardwood production declined by 12.9 million m^3 (42%) between 2004 and 2009. Production increased by nearly 6.5 million m^3 between the low point in 2009 and 2018 but is still less than 25 million m^3 (graph 5.4.4). This level of production is roughly equal to North American production in the early 1980s. Sawn hardwood production in North America was essentially flat in 2018: Canadian production increased by 61,000 m^3 (3.9%) and US production declined by 120,000 m^3 (0.5%).

The decline in North American production since 2004 is the result of reduced domestic consumption and associated reduced prices for sawn hardwood used in appearance applications. Although prices remain relatively high for industrial pallet cants and sleepers, prices for number 1 common grade sawn hardwood are still at levels historically associated with recessions in the twentieth century.

Although it is difficult to directly estimate, a greater volume of sawn industrial products is being manufactured from lower-quality logs in the US. One indication of this is the real price of low-quality "blocking logs" in Ohio, which traded at prices above 2004 levels in 2018, while prices of higher-quality sawlogs were below 2004 levels (ODNR & OSUE, 2003-2018). The only species for which high-quality logs were above 2004 prices in 2018 was black walnut, due to increased sawn hardwood and log exports.

5.5 Extraregional influences affecting the UNECE region

Asia continues to dominate the tropical sawnwood trade, with China and, to a lesser extent, Thailand and Viet Nam the major importers and Cameroon, Gabon, Malaysia and Thailand the major exporters. World imports of tropical sawnwood increased each year from a low in 2012 to reach 12.3 million m^3 in 2017; the volume declined in 2018, however, to 11.7 million m^3 (ITTO, 2019).

China imported 58% of world exports of tropical sawnwood in 2018, although the volume was down in 2018 (at 7.2 million m^3) after a period of rapid growth in 2014-2017 and a record 7.4 million m^3 in 2017 (table 5.5.1). China's demand for tropical sawnwood has been driven by a decline in the availability of tropical logs as more producer countries impose restrictions on log exports, and by increasing manufacturing costs in China, which have made tropical sawnwood imports more competitive with domestic sawnwood. Although the import volume was still high in 2018, domestic demand reportedly dropped at the end of 2018 and in early 2019. In 2019, imports are expected to be affected by the trade dispute with the US and volatility in the renminbi exchange rate, with domestic consumption expected to decline as the economy slows. China's major suppliers of tropical sawnwood in 2017 were Thailand (65% by volume), Viet Nam (7%), Gabon (6%), Malaysia (5%), and Indonesia and the Philippines (both 4%). Sawn hardwood demand is increasingly driven by domestic consumption in China's interior joinery and furniture sectors, which are servicing a rapidly growing middle class. Although

TABLE 5.5.1

Major importers and exporters of tropical sawn hardwood outside the UNECE region, 2015-2017
(thousand m^3)

	2016	*2017*	*2018*	*Change (%) 2017-2018*
MAJOR IMPORTERS				
China	6,579	7,393	7,190	-2.7
Thailand	868	687	…	…
India	277	360	295	-18.0
Viet Nam	545	618	…	…
Philippines	306	268	219	-18.3
MAJOR EXPORTERS				
Thailand	4,161	4,859	4,459	-8.2
Malaysia	1,960	2,154	2,135	-0.8
Cameroon	496	663	942	42.1
Lao People's Democratic Republic	800	646	700	8.4
Viet Nam	483	512	539	5.3

Note: … = not available.

Sources: Comtrade, 2019; ITTO, 2019; China Customs, 2019.

China's imports from Thailand are predominantly of lower-value rubberwood, Africa's supplies are mainly of high-value specialty timbers for the high-end market (ITTO, 2018 and ITTO, 2019).

Thailand was the second-largest importer of tropical sawnwood in 2017, importing mainly structural-grade material from Malaysia (60% of tropical sawnwood imports), with the Lao People's Democratic Republic the only other significant supplier. Tropical sawnwood imports declined in Thailand in 2015 when political turmoil disrupted economic activity, including construction activity; it recovered in 2016 but dropped again in 2017, to 687,000 m^3. A significant feature of the tropical sawnwood trade in Asia is the reciprocal trade between some countries, with Malaysia and Thailand importing and exporting significant volumes of each other's tropical sawnwood (ITTO, 2018 and ITTO, 2019).

India, the US and Viet Nam were also important markets for tropical sawnwood in 2018. India's imports have been affected in 2019, however, by the volatility of the rupee and by slowing construction activity in response to financing difficulties because of the introduction of a goods and services tax.

Thailand was the top-ranked exporter of tropical sawnwood in 2018, most of which was plantation rubberwood. Its export volume rose by 17% in 2017, reaching 4.9 million m^3. The volume declined in 2018, however, to 4.5 million m^3, reflecting slowing demand in China's secondary processed wood products' industries (China imported more than 99% of Thailand's tropical sawnwood exports in 2018). Malaysia's exports totalled 2.1 million m^3 in 2018; however, the availability of Malaysian certified sawnwood, which is preferred for conformance with the EU Timber Regulation and other green procurement requirements, was reportedly limited in early 2019. (ITTO, 2018 and ITTO, 2019)

Tropical sawnwood exports from Africa comprised about 18% of world exports in 2018, with Cameroon and Gabon the major exporters. Gabon's exports rose significantly (by 42%) in 2018, to 942,000 m^3, with a surge in exports to China accounting for most of the increase. EU markets have been important destinations for African sawnwood exports, but a significant trend in Africa is the shift in industry investment away from predominantly European to Asian-owned firms, reflecting an increase in China's demand for hardwood sawnwood from non-traditional sources. Asian markets take a wider range of species than required by European buyers, and the costs are also higher in supplying the certified products required by European markets (ITTO, 2018). The main drivers of the overall decline in tropical timber demand in the EU, in declining order of significance, have been identified as substitution by temperate wood, composites and other materials; environmental prejudice; competition from outside the EU for raw materials and finished goods; and the challenges of conformance with the EU Timber Regulation (FLEGT IMM, 2019).

5.6 Policy and regulatory influences

As a consequence of the ongoing trade dispute between China and the US, first-quarter exports of sawn hardwood from the US to China fell by 40%, year-on-year (to 352,000 m^3). The situation had escalated by June 2019, with retaliatory tariffs (as high as 25%) from China affecting about $60 billion of products from the US, including sawn hardwood and logs (Timber Industry News, 2019).

The US hardwood industry was not included in the US government assistance package offered to farmers affected by the trade dispute. The reduced production of hardwood lumber due to the higher tariffs has already affected the domestic production of pallets. Pallet manufacturers have been large consumers of lower-grade hardwood lumber but are having to transition to less-durable softwood because curtailed hardwood sawnwood production is reducing their ability to source their preferred materials (Brindley, 2019).

Note: The statistical annex of the *Forest Products Annual Market Review 2018-2019* is available at: www.unece.org/forests/fpamr2019-annex

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Chapter 6

WOOD-BASED PANELS

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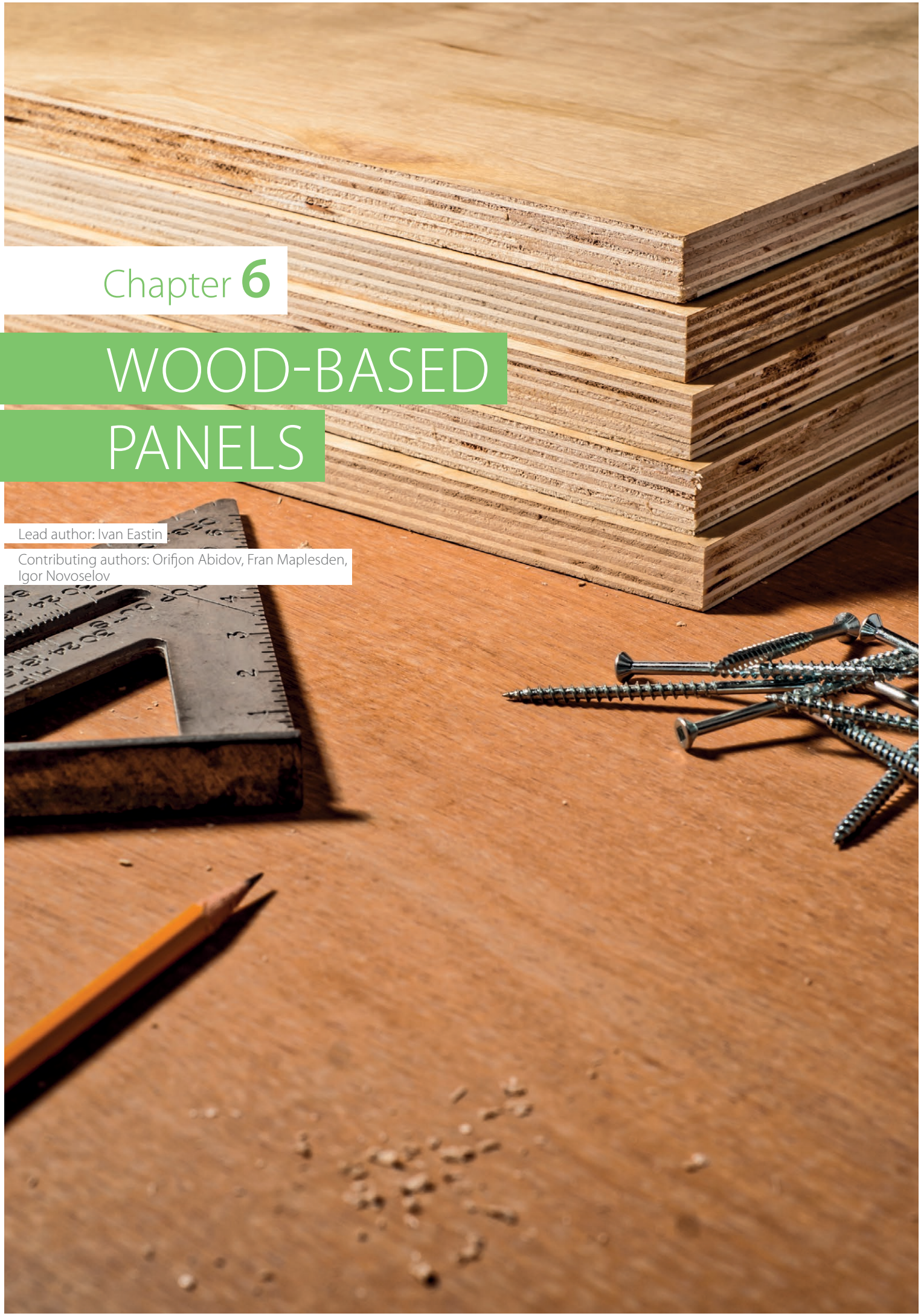


Highlights

Overall demand for structural panels in North America is expected to increase by 2.4% in 2019, due primarily to strong demand for OSB (set to increase by 6.2%); demand for plywood is expected to fall by 1.6% in the subregion, however.

Two-thirds of overall particle board production and more than half of MDF production in Europe was consumed in the furniture sector in 2018.

The apparent consumption of wood-based panels increased by 9.6% in the CIS subregion in 2018, to 20.3 million m^3.

OSB exports from the Russian Federation more than doubled in 2018, reaching 257,000 m^3.

Japan's tropical plywood imports picked up in 2017 and 2018 in response to steady housing demand and the anticipated effects on housing prices of a rise in the consumption tax in 2019.

Chinese hardwood plywood lost market share in the US in 2018 due to US tariffs. On the other hand, Chinese exports of softwood plywood (primarily for non-structural applications) to the US jumped by 54.3% as Chinese manufacturers placing softwood veneers on the outside faces of hardwood plywood panels.

China's exports of tropical plywood dropped by 16% in 2018, to 675,000 m^3, in response to a significant drop in production as the industry adjusts to new environmental regulations.

6.1 Introduction

In general, 2018 was a mixed year for the wood-based panel sector in the UNECE region. Strong economic growth in North America did not drive up consumption or production but a mild winter in the CIS helped drive demand for wood-based panels in most end-use applications. Overall, panel production was up by 1.1% in the UNECE region and apparent consumption grew by 1.3%. Growth in the wood-based panels sector is projected to continue into 2019, with production expected to increase by 2.1% and apparent consumption by 0.5% (FAOSTAT, 2019).

6.2 Europe

Wood-based panel production was almost unchanged overall in Europe in 2018, at nearly 75 million m^3 (table 6.2.1) (FAOSTAT, 2019). There was a sizeable (4.8%) drop in plywood production, however, and the production of oriented strand board (OSB) retracted slightly (by 0.4%). Fibreboard production increased by 0.4% and particle board production by 0.3% (FAOSTAT, 2019).

6.2.1 Consumption

Particle board. Europe's apparent consumption of particle board is expected to increase by 1.7% in 2019 (FAOSTAT, 2019). The main end use is in furniture production (67%), followed by construction (21%) and packaging (12%) (EPF, 2019).[5]

Fibreboard. The consumption of fibreboard increased by 985,000 m^3 (4.5%) in 2018, to 22.8 million m^3 (FAOSTAT, 2019).

MDF. Furniture (56%) was by far the largest end-use segment for medium-density fibreboard (MDF) in 2018, followed by laminate flooring (16%), other segments (15%), building (10%) and moulding products (3%) (EPF, 2019).

OSB. Continued improvement in building activity in Europe in 2018 supported 1.9% growth in OSB consumption (FAOSTAT, 2019). OSB/3 (for humid conditions) panels were the major OSB category (87% of European OSB output in 2018). OSB/2 panels (for dry conditions) constituted 11% of production and OSB/4 panels (heavy-duty for humid conditions) accounted for 2% (EPF, 2019).

5 Figures and trends provided by the European Panels Federation (EPF) for its 27-member countries differ from those for the European subregion reported in FAOSTAT (39 countries, including Israel, Serbia and Turkey). The EPF reports information for the following 27 European countries: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the UK. In this chapter, data and trends attributed to the EPF pertain to these countries.

TABLE 6.2.1

Wood-based panel balance, Europe, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	74,972	74,877	76,918	-0.1
Imports	35,330	35,929	36,271	1.7
Exports	36,002	35,136	36,403	-2.4
Apparent consumption	74,299	75,670	76,786	1.8

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

Plywood. Overall plywood consumption in Europe dropped by less than 1% in 2018 (FAOSTAT, 2019). The main applications were in construction (39%) and furniture (30%), followed by transport (13%), packaging (8%) and other uses (10%) (EPF, 2019).

6.2.2 Production and capacity utilization

Graph 6.2.1 shows that particle board comprised more than half of total wood-based panel production in Europe in 2018. Fibreboard accounted for 33% and OSB for almost 10% (FAOSTAT, 2019).

Particle board. European particle board production increased by 0.3% in 2018, to 37.8 million m^3. This volume is still well below the peak obtained in 2007 (EPF, 2019; FAOSTAT, 2019).

Particle board production capacity increased by 3.1% in EPF member countries in 2018, to 37.8 million m^3. New capacity came online in Poland, there were capacity expansions in Portugal and Spain, and a shuttered mill in Italy restarted. Overall, however, particleboard capacity in EPF member countries in 2018 was still substantially below the pre-global-financial-crisis level of 43 million m^3 (EPF, 2019).

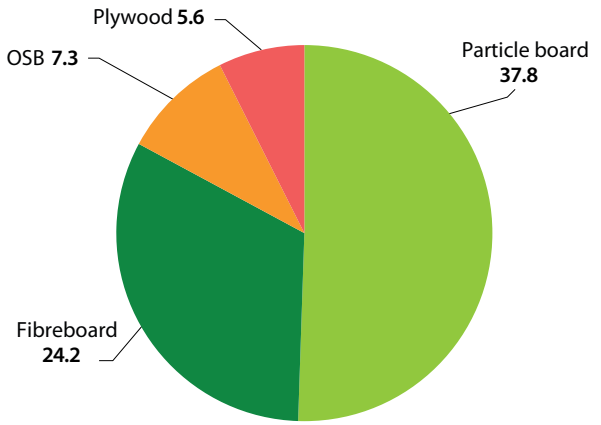
Fibreboard. The production of fibreboard increased by 102,000 m^3 (0.42%) in 2018, to 24.2 million m^3. The top five producing countries were, in descending order, Germany, Poland, Turkey, Spain and France, together accounting for about 76% of production in the subregion (FAOSTAT, 2019).

MDF. European MDF production capacity increased by 400,000 m^3 in 2018, mainly as a result of the restart of a plant in Romania. Capacity totalled near 15.1 million m^3 in 2018 (EPF, 2019).

European production of wet-process hardboard totalled 533,000 m^3 in 2018, up by 1.5% compared with 2017. Total

GRAPH 6.2.1

Wood-based panel production, Europe, 2018
(million m^3)



Notes: Total wood-based panel production in Europe in 2018 = 74.4 million m^3. "Fibreboard" comprises MDF (72%), Other board (16%) and hardboard (12%).

Source: FAOSTAT, 2019.

installed wet-process hardboard production capacity in EU28 and EFTA[6] countries was little changed in 2018, at 707,000 m^3 (EPF, 2019).

Fibreboard. The production of fibreboard increased by 102,000 m^3 (0.42%) in 2018, to 24.2 million m^3. The top five producing countries were, in descending order, Germany, Poland, Turkey, Spain and France, together accounting for about 76% of production in the subregion (FAOSTAT, 2019).

MDF. European MDF production capacity increased by 400,000 m^3 in 2018, mainly as a result of the restart of a plant in Romania. Capacity totalled near 15.1 million m^3 in 2018 (EPF, 2019).

European production of wet-process hardboard totalled 533,000 m^3 in 2018, up by 1.5% compared with 2017. Total installed wet-process hardboard production capacity in EU28 and EFTA[7] countries was little changed in 2018, at 707,000 m^3 (EPF, 2019).

The installed production capacity for rigid softboard was steady in 2018, at 3.5 million m^3. Flex softboard production capacity increased by 100,000 m^3, to 2.3 million m^3, thanks to

6 Official country-supplied data on wet-process hardboard are not considered reliable because of misclassification between it and HDF, but producer data supplied to the EPF are considered reliable. Thus, the figures reported here are not for the entire European subregion.

7 Official country-supplied data on wet-process hardboard are not considered reliable because of misclassification between it and HDF, but producer data supplied to the EPF are considered reliable. Thus, the figures reported here are not for the entire European subregion.

an expansion project in France (EPF, 2019). Both rigid and flex softboard are non-structural panels (also known as insulation board): rigid softboard is often used as ceiling panels for aesthetics (to hide wiring and plumbing) and for thermal and acoustic purposes, and flexible softboard is used in walls as an insulator in place of fibreglass or foam panels).

OSB. Total European (excluding Turkey) production capacity of OSB increased by 200,000 m^3 (3%) in 2018, to 6.9 million m^3, due to an expansion of capacity in Luxembourg (EPF, 2019).

Plywood. European plywood production decreased by 4.8% in 2018, to 5.6 million m^3. There were declines of 0.8% in Finland (the largest producer in the subregion, accounting for more than 20% of production) and 25.8% in Spain (the second-largest producer, with 13% of total production) (EPF, 2019).

6.2.3 Trade

6.2.3.1 Imports

Particle board. European countries imported 12.8 million m^3 of particle board in 2018, a drop of 0.2% compared with 2017 (FAOSTAT, 2019). Germany remained the largest European importer, at nearly 2.1 million m^3. Despite a decline of 6.2% in 2018, Poland remained the second-largest importer ahead of Italy (FAOSTAT, 2019).

Fibreboard. European imports of fibreboard increased by 4.3% in 2018, to 11.4 million m^3. Germany was the largest importer, followed by France and then Belgium; combined, these three countries accounted for more than 30% of imports in 2018 (FAOSTAT, 2019).

OSB. European imports of OSB were steady in 2018, at 3.6 million m^3. The imports came mainly from Belarus, the Russian Federation, Ukraine, the US and China (in descending order, by volume) (Comtrade, 2019).

Plywood. Europe imported more than 8.2 million m^3 of plywood in 2018, an increase of 1.9% over 2017. Germany (+3.5%) was Europe's largest importer of plywood in 2018,

with a volume of more than 1.5 million m^3. The UK (+7.5%) maintained second position, importing 1.3 million m^3, ahead of the Netherlands (+7.6%) at 680,000 m^3 (FAOSTAT, 2019).

6.2.3.2 Exports

Particle board. Particle board exports from countries in the European subregion increased to 13.6 million m^3 in 2018. Austria remained the largest exporter, with a volume of 1.93 million m^3 (down by 0.8% over 2017), just ahead of Germany at 1.91 million m^3 (+1.2%). France was the subregion's third-largest exporter in 2018, at 1.5 million m^3 (+1.1%) (FAOSTAT, 2019).

Fibreboard. European exports of fibreboard decreased by 3.1% in 2018, to 12.8 million m^3. Germany is by far the biggest exporter, followed by Poland and France; combined, these three countries accounted for more than 50% of the subregion's exports in 2018 (FAOSTAT, 2019).

OSB. European exports of OSB declined by 3.5% in 2018, to 4.3 million m^3 (FAOSTAT, 2019). EU OSB exports in 2018 went mainly to Switzerland, Turkey, Norway, Japan and Chile (in descending order, by volume) (Comtrade, 2019).

Plywood. Exports from the European subregion totalled 4.6 million m^3 in 2018, down by 0.8% over 2017. More than three-quarters of this volume comprised broadleaved plywood, followed by coniferous (16%) and tropical (8%) plywood. Finland maintained its position as the subregion's largest plywood exporter, at nearly 1 million m^3 (down by 2.6% compared with 2017), followed by Belgium (403,000 m^3, no change) and Germany (390,000 m^3, +2.4%). Austria, Latvia and Poland are other significant European plywood exporters, each shipping out more than 300,000 m^3 of plywood in 2018 (FAOSTAT, 2019).

6.3 CIS, with a focus on the Russian Federation

Trends in the production and consumption of wood-based panels were mostly positive in 2018. In the Russian Federation, the 2018 winter harvesting season, and the whole year, were favourable for logging companies (as opposed to the log shortages of 2017). All wood-based panel producers received sufficient raw materials, and demand was stable. The country's total wood harvesting volume grew by 12% in 2018, setting an absolute record since 1990.

6.3.1 Consumption

Apparent consumption of wood-based panels increased by 9.6% in the CIS subregion in 2018, to 20.3 million m^3 (table 6.3.1).

6.3.2 Production and capacity utilization

The production of wood-based panels in the CIS increased by 9.7% in 2018, to 24.9 million m^3. The Russian Federation's production was 17.3 million m^3, an increase of 11.2% over 2017 (FAOSTAT, 2019).

Plywood. Plywood production increased by 7.6% in the CIS subregion in 2018, to 4.6 million m^3. The Russian Federation

TABLE 6.3.1

Wood-based panel balance, CIS, 2017-2019 (thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2016-2017*
Production	22,705	24,906	25,988	9.7
Imports	5,048	5,209	4,979	3.2
Exports	9,268	9,850	10,381	6.3
Apparent consumption	18,485	20,265	20,586	9.6

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

TABLE 6.3.2

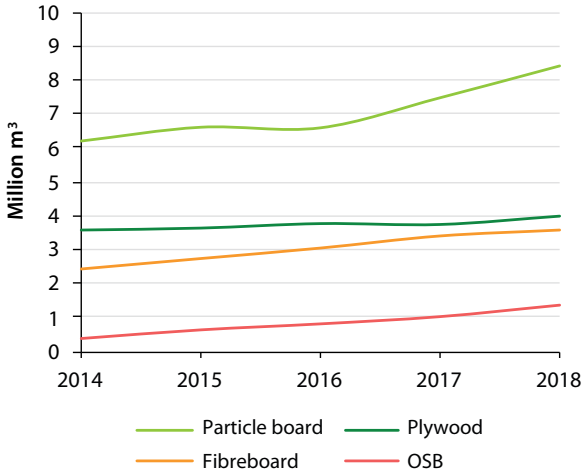
Wood-based panel production, Russian Federation, 2015-2018 (thousand m^3)

	2015	*2016*	*2017*	*2018*	*Change (%) 2017-2018*
Plywood	3,607	3,759	3,729	4,013	7.6
Particle board	6,591	6,573	7,460	8,400	12.6
Fibreboard	2,722	3,032	3,390	3,565	5.2
OSB	618	797	1,013	1,356	33.9
Total	13,538	14,161	15,592	17,334	11.0

Source: FAOSTAT, 2019.

GRAPH 6.3.1

Wood-based panel production, Russian Federation, 2014-2018



Source: FAOSTAT, 2019.

produced 4.0 million m³, an increase of 7.6% over 2017 (graph 6.3.1; table 6.3.2). Production increased because of a plentiful supply of veneer logs and an expansion of plywood mill capacities (WhatWood, 2019a). The current capacity of Russian plywood plants is 4.7 million m³ per year (WhatWood, 2019a) and the average capacity utilization is 85%. The capacity of plywood plants continued to grow in 2018, due mainly to targeted investment projects for the modernization of existing plants and the startup of new facilities in Murashinsky, Russia (WhatWood, 2019a). The capacity of newly announced plywood investment projects to 2022 amounts to 1.4 million m³ (WhatWood, 2019a).

Particle board. Particle board production increased by 9.1% in the CIS in 2018, to 11.8 million m³. Particleboard production in the Russian Federation grew by 12.6%, to 8.4 million m³, with the increase due largely to the increased output by the companies Kronospan Bashkortostan, Swiss Krono and Tomlesdrev (WhatWood, 2019b).

OSB. OSB production increased significantly (+22.6%) in the CIS subregion in 2018, to 2.2 million m³. The increase was driven entirely by a rise in production in the Russian Federation, where OSB production climbed by 34% in 2018, to 1.4 million m³. The growth in production was ensured by additional production capacity at the Talion Arbor plant (Tver region, Torzhok) and the launch of the new OSB line, Kronospan OSB, in Bashkiria, Ufa (WhatWood, 2019c). Apparent OSB consumption in the CIS subregion was 2 million m³ in 2018, up by 13.7% compared with 2017 (FAOSTAT, 2019).

Fibreboard. Fibreboard production increased by 8.4% in the CIS subregion in 2018, to 6.4 million m³. Production increased in the Russian Federation by 5.2%, to 3.6 million m³ (table 6.3.2). The gains were made by the following companies: Egger Gagarin, Kastamonu, Kronospan and Swiss Krono. Current production capacity for MDF and high-density fibreboard (HDF) is 4.2 million m³. Seventy-four percent of the volume of MDF/HDF produced in the Russian Federation is controlled by companies with foreign capital – Kastamonu, Swiss Krono, Kronospan, Egger and Asinovsky MDF (WhatWood, 2019d).

6.3.3 Prices

Plywood. Russian producer prices for plywood (averaged across all regions) increased by 16.9% in 2018, to 28,740 roubles per m³. Export prices increased by 18.1%, to 30,775 roubles per m³ (graph 6.3.2). From the second quarter of 2018, the Russian plywood market was marked by negative price dynamics, which began as a result of excess demand and a global trend of lower prices for forest products (WhatWood, 2019a; Trade Data Monitor, 2019; FAOSTAT, 2019).

Particle board. The average price of particle board in the Russian Federation rose by 26% in 2018, to 16,512 roubles per m³. Export prices saw a slight decrease in the first quarter of 2019 (Trade Data Monitor, 2019; FAOSTAT, 2019).

Fibreboard. Average export prices increased by 13%, to 16,402 roubles per m³ (graph 6.3.2). Prices continued to increase in the first quarter of 2019 (Trade Data Monitor, 2019; FAOSTAT, 2019).

6.3.4 Trade

6.3.4.1 Imports

Plywood. The volume of plywood imported by CIS countries increased by 7.0% in 2018, to 518,000 m³ (graph 6.3.3). Imports into the Russian Federation grew by 10.5%, to 74,000 m³ (mainly from Belarus and China). Plywood imports are of minor importance in the Russian Federation.

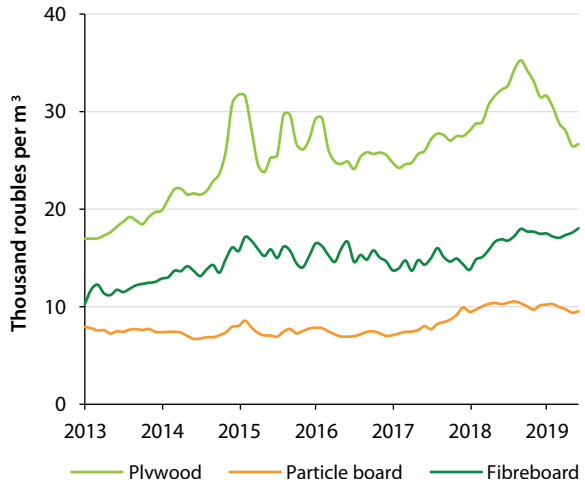
OSB. CIS imports of OSB – mainly between CIS countries – decreased by 5.2% in 2018, to 686,000 m³. Russian Federation imports declined slightly in 2018 (graph 6.3.3); Belarus is still the main supplier.

Particle board. CIS imports of particle board increased by 1.3% in 2018, to 2.07 million m³. Imports into the Russian Federation were up by 7.9%, to 275,000 m³ (graph 6.3.3). Belarusian deliveries of particle board to the Russian Federation increased by 13.5% in 2018, to 226,000 m³ (WhatWood, 2019b).

Fibreboard. Overall, CIS fibreboard imports increased by 7.7% in 2018, to 1.9 million m³, but imports by the Russian Federation fell by 0.7%, to 481,000 m³ (graph 6.3.3). The main exporters of MDF, HDF and insulation board to the Russian market in the last few years have been Belarus, China, Germany

GRAPH 6.3.2

Monthly prices for wood-based panel exports, Russian Federation, 2013-2019

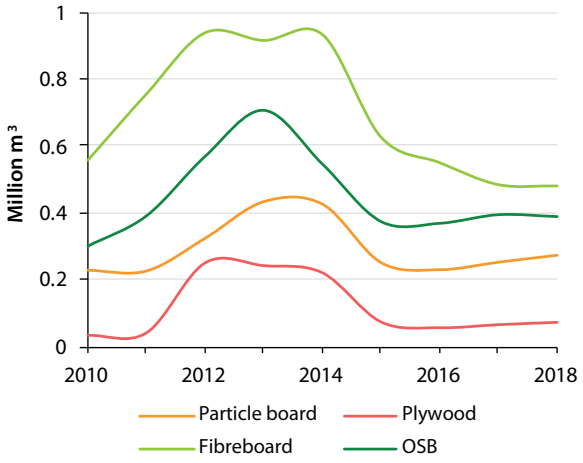


Notes: Particle board tonnes (mt) converted to m^3 using 1.65 m^3 = 1 mt; fibreboard tonnes (mt) converted to m^3 using 1.43 m^3= 1 mt

Source: Trade Data Monitor, 2019; FAOSTAT, 2019.

GRAPH 6.3.3

Imports of fibreboard, OSB, particle board and plywood, Russian Federation, 2010-2018



Source: FAOSTAT, 2019.

and Poland (in decreasing order of magnitude); these four countries accounted for 92% of Russian imports of fibreboard in 2018 (WhatWood, 2019b). About 80% of the products imported into the Russian Federation under the HS code for fibreboard are semi-finished or finished products (e.g. flooring, wall and ceiling panels, blanks for interior doors, baseboards and mouldings) (WhatWood, 2019e; FAOSTAT, 2019).

6.3.4.2 Exports

Plywood. CIS plywood exports grew by 8.4% in 2018, to just over 3.0 million m^3. Russian plywood exports increased by 8.6%, to 2.7 million m^3 (graph 6.3.4). Deliveries from the CIS to Turkey fell sharply (by 56%) in 2018, to 40,000 m^3. Plywood exports from the CIS to the US increased significantly (by 22%), to 412,000 m^3, as did exports to Egypt, which grew by 13% to 310,000 m^3 (WhatWood, 2019a); those two countries were the main export markets for Russian plywood in 2018 (graph 6.3.5).

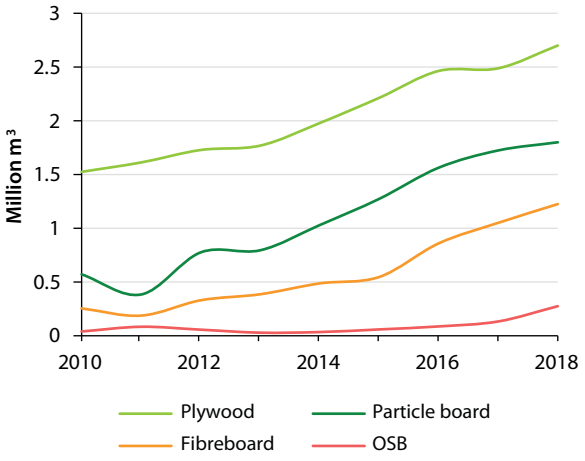
Particle board. CIS exports of particle board decreased by 2.6% in 2018, to 3.3 million m^3. Exports have grown by 69.7% since 2014, driven mainly by the Russian Federation, where exports increased from 1.0 million m^3 in 2014 to 1.8 million m^3 in 2018. The increase in Russian exports was much lower in 2018 than in each of the previous four years, however, at 4.4% (WhatWood, 2019b; FAOSTAT, 2019).

Fibreboard. CIS fibreboard exports increased by 19.4% in 2018, to 2.6 million m^3 (FAOSTAT, 2019). About half the volume (1.2 million m^3) originates in the Russian Federation. Export volumes from the Russian Federation have almost tripled since 2014, and they grew by 16.5% in 2018 (FAOSTAT, 2019).

OSB. The CIS exported 869,000 m^3 of OSB in 2018 (up by 2.0%). The volume of OSB exports from the Russian Federation more than doubled (125%) to 257,000 m^3. About one-third of the export volume from the Russian Federation went to Kazakhstan (WhatWood, 2019c; FAOSTAT, 2019).

GRAPH 6.3.4

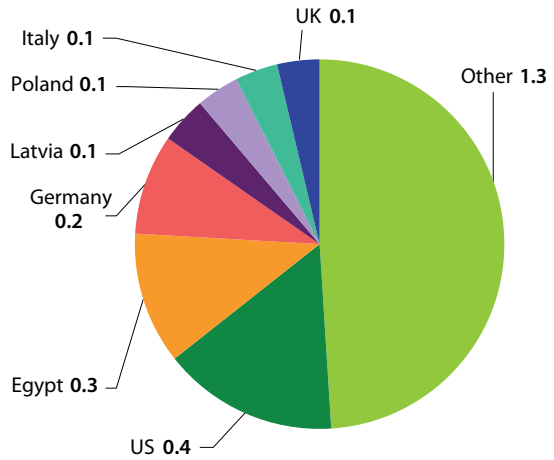
Exports of fibreboard, OSB, particle board and plywood, Russian Federation, 2010-2018



Source: FAOSTAT, 2019.

GRAPH 6.3.5

Plywood exports, Russian Federation, 2018 (million m³)



Note: The total volume of plywood exports from the Russian Federation in 2018 was 2.7 million m³.

Source: WhatWood, 2019a.

6.4 North America

6.4.1 Consumption

The consumption of wood-based panels in North America is tied to economic growth and housing starts. GDP growth in the US rose from 2.2% in 2017 to 2.9% in 2018; it is projected to ease slightly in 2019, to 2.4%. US housing starts grew from 1.2 million in 2017 to 1.24 million in 2018 and are projected to be stable at 1.25 million in 2019 (US Census Bureau, 2019; MBA, 2019). GDP growth in Canada fell from just over 3% in 2017 to 2.1% in 2018; 2.1% is also projected for 2019. Canadian housing starts fell from 219,800 in 2017 to 202,400 in 2018. A further fall is projected for 2019, to 194,000, as home buyers continue to adjust to the overheated housing market (BMO, 2019; RBC, 2019; Scotia Bank, 2018; TD Bank, 2019). The apparent consumption of wood-based panels in North America decreased by 1.9% in 2018; total wood-based panel production in the subregion decreased by 1.0%, to 48.1 million m³ (table 6.4.1).

The consumption of structural wood-based panels in North America was fairly stable (up by 0.8%) in 2018 (graph 6.4.1), with demand for OSB and plywood increasing by 1.0% and 0.2%, respectively (FAOSTAT, 2019).

The largest market for OSB in 2018 was residential construction, which consumed 57.2% of total production.

TABLE 6.4.1

Wood-based panel balance, North America, 2017-2019 (thousand m³)

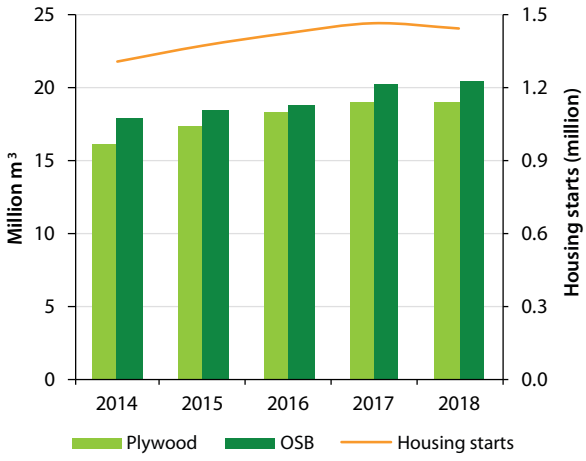
	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	48,581	48,072	48,115	-1.0
Imports	18,281	19,470	18,546	6.5
Exports	10,259	12,033	11,826	17.3
Apparent consumption	56,603	55,509	54,835	-1.9

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

GRAPH 6.4.1

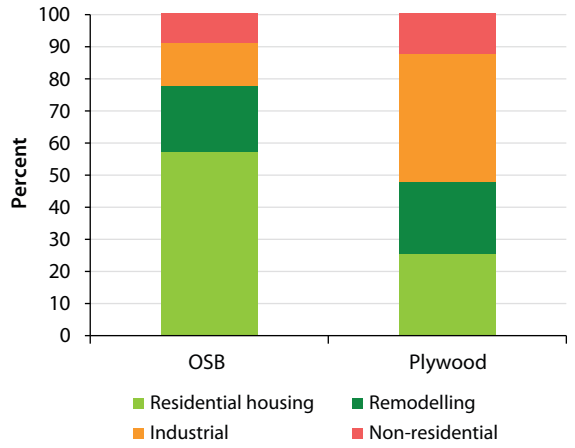
Structural panel consumption and housing starts, North America, 2014-2018



Sources: FAOSTAT, 2019; APA, 2019.

GRAPH 6.4.2

Four main end-use markets for OSB and plywood, North America, 2018



Notes: Residential, non-residential and industrial are new construction.

Source: APA, 2019.

The strongest growth in demand for OSB was also in the residential housing sector, with an increase of 4.5% in 2018. Demand for OSB increased by 1.2% in the remodelling market and by 0.7% in the non-residential sector; it declined by 3.0% in the industrial market. The largest market for plywood in 2017 was the industrial sector, which consumed 39.6% of total plywood production. Plywood demand grew by 14.8% in the industrial sector, by 1.5% in the remodelling sector and by 1.2% in non-residential sector, but it fell by 3.7% in the residential housing sector (graph 6.4.2) (APA, 2019).

North American demand for structural panels is expected to increase overall by 2.4% in 2019, comprising an increase of 6.2% for OSB and a decrease of 1.6% for plywood. The total apparent consumption of wood-based panels in North America is projected to increase by 2.4% in 2019 (FAOSTAT, 2019).

North American consumption of non-structural panels (particle board and fibreboard) was down by 7.6% in 2018, with fibreboard dropping by 10.0% and particle board by 3.5%. With North American housing starts projected to remain stable in 2019, the production of non-structural wood-based panels is not expected to grow in 2019 (Composite Panel Association, 2019a, 2019b).

6.4.2 Production and capacity utilization

Production capacity in the North American structural panel subsector increased by 2.1% in 2018, to 38.9 million m^3. Despite this increase, capacity utilization in the North American structural panel industry decreased from 77.8% in 2017 to 77.6% in 2018; it is expected to fall to 74% in 2019. Capacity utilization in the plywood subsector decreased in 2018 from 76% in 2017 to 74% in the US and from 78% to 76% in Canada. Capacity utilization in the OSB subsector was up slightly in North America, at 79% (graph 6.4.3), increasing from 80% to 81% in the US and from 78% to 79% in Canada (APA, 2019).

North American production capacity for non-structural panels was up by 1.5% in 2018, to approximately 13.5 million m^3 (Composite Panel Association, 2019b), with most of the increase occurring in the US. The capacity utilization rate decreased in the particle board subsector, from 70.3% in 2017 to 69.8% in 2018, but it increased in the MDF subsector, from 76.3% in 2017 to 79.0% in 2018.

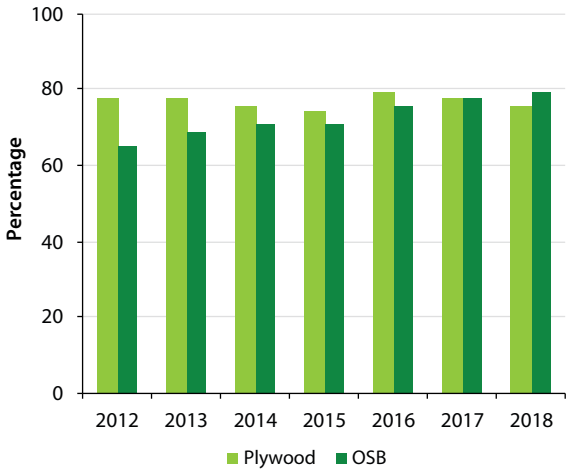
6.4.3 Prices

The overall increase in demand for most types of wood-based panels in North America helped increase capacity utilization rates in 2018. Not surprisingly, the increase in demand helped drive up product prices and contributed to substantial price increases in the first half of 2018 (graph 6.4.4). The Federal Reserve raised interest rates four times in 2018, from 1.5% to 2.5%, which pushed up mortgage rates and caused housing starts to decline.

OSB prices showed strong price growth in the first half of 2018 before falling in the second half; overall, there was a decrease of 34.8% for the year. Southern plywood prices dropped by 22.8% in 2018 and western plywood prices were down by 26.8%. Prices for both particle board and MDF were

GRAPH 6.4.3

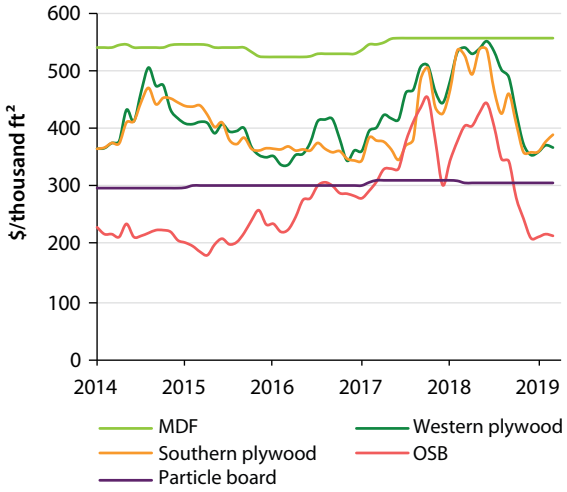
Plywood and OSB capacity utilization rates, North America, 2012-2018



Source: APA, 2019.

GRAPH 6.4.4

Wood-based panel prices, North America, 2014-2019



Notes: Western plywood (Coast), ½ inch, CD exterior (3-ply); OSB (North Central), 7/16 inch; MDF (East) 5/8 inch; particleboard (West) 5/8 inch industrial.

Source: Random Lengths, 2019.

flat, with MDF prices showing no change and particle board prices declining by 1.6% (Random Lengths, 2019).

6.4.4 Trade

6.4.4.1 Imports

The value of North American imports of wood-based panels increased by 0.7% in 2018, to $7.0 billion (table 6.4.2). The value of panel imports grew by 1% in the US but fell by 1.5% in Canada (FAOSTAT, 2019). Plywood comprised the largest share of imports to North America (47.4% of the total value of wood-based panel imports), followed by OSB (23.8%), fibreboard (22.8%) and particle board (6.0%). North American imports from outside the subregion increased in 2018 for all four categories of wood-based panels.

US tariffs on Chinese hardwood plywood had a significant impact on US imports of plywood panels in 2018, causing China's market share to fall from 41.7% in 2017 to 31.3% in 2018. As a result, market share increased for Indonesia (from 8.3% to 12.5%), Brazil (from 7.8% to 9.2%), Chile (from 5.1% to 6.3%) and Viet Nam (from 2.7% to 6.2%).

Chinese hardwood plywood manufacturers have begun placing softwood veneers on the outside faces of hardwood plywood panels to evade punitive tariffs. Accordingly, Chinese exports of softwood-faced plywood panels to the US jumped by 54.3% in 2018 (Coalition for Fair Trade of Hardwood Plywood, 2019). Overall, however, Chinese plywood exports to the US fell by 9.3%, from $1.14 billion in 2017 to $1.04 billion in 2018. Total US plywood imports (excluding North American trade) leapt by 21.2% in 2018 (to $3.3 billion).

6.4.4.2 Exports

The value of exports of wood-based panels from North America grew by 4.4% in 2018, to $3.4 billion, with Canada accounting for 76.2% of the total (table 6.4.3). The value of exports from North America (including trade between Canada and the US) increased by 13.3% for OSB and by 9.7% for fibreboard but decreased for particle board (-1.6%) and plywood (-15.3%). The largest markets for US plywood exports in 2018 were Canada (39% by value), Mexico (19.2%) and Australia (16.2%). Canada (72.1%) and Mexico (13.3%) were the main markets for US fibreboard, while the main markets for US particle board were Canada (56%) and Mexico (30.7%). Canadian wood-based panel exports went almost exclusively to the US – including 94.6% of plywood, 97.9% of fibreboard, 95.5% of particle board and 95% of OSB.

TABLE 6.4.2

Value of wood-based panel imports, North America, 2015-2018 ($ million)

	2015	*2016*	*2017*	*2018*	*Change (%) 2017-2018*
US					
Plywood	2,681	2,775	2,917	2,907	-0.3
OSB	948	1,236	1,452	1,630	12.3
Particle board	289	321	333	310	-7.0
Fibreboard	1,138	1,178	1,274	1,191	-6.5
Total	**5,056**	**5,510**	**5,976**	**6,038**	**1.0**
CANADA					
Plywood	334	342	416	415	-0.2
OSB	28	29	39	34	-11.3
Particle board	66	65	99	106	7.4
Fibreboard	411	430	427	410	-3.9
Total	**839**	**866**	**980**	**966**	**-1.5**
NORTH AMERICA					
Plywood	3,015	3,117	3,333	3,322	-0.3
OSB	976	1,265	1,491	1,665	11.7
Particle board	355	386	433	416	-3.7
Fibreboard	1,548	1,608	1,700	1,601	-5.8
Total	**5,895**	**6,377**	**6,956**	**7,004**	**0.7**

Note: Does not include veneer sheets.

Source: FAOSTAT, 2019.

TABLE 6.4.3

Value of wood-based panel exports, North America, 2015-2018 ($ million)

	2015	*2016*	*2017*	*2018*	*Change (%) 2017-2018*
US					
Plywood	346	344	415	276	-33.5
OSB	64	65	55	67	22.6
Particle board	110	97	90	97	7.9
Fibreboard	219	213	210	220	5.1
Total	**739**	**719**	**769**	**661**	**-14.1**
CANADA					
Plywood	348	314	341	364	6.7
OSB	1,010	1,314	1,538	1,738	13.0
Particle board	257	272	272	259	-4.8
Fibreboard	291	297	307	346	12.8
Total	**1,905**	**2,197**	**2,458**	**2,708**	**10.1**
NORTH AMERICA					
Plywood	693	658	756	640	-15.3
OSB	1,074	1,379	1,593	1,806	13.3
Particle board	367	369	362	356	-1.6
Fibreboard	510	510	517	567	9.7
Total	**2,644**	**2,916**	**3,228**	**3,368**	**4.4**

Note: Does not include veneer sheets.

Source: FAOSTAT, 2019.

6.5 Extraregional influences affecting the UNECE region

A few major players continue to dominate the global trade of tropical plywood: Japan, the Republic of Korea and the US are the main importers and Indonesia and Malaysia are the biggest exporters (table 6.5.1). World imports of tropical plywood increased from a low in 2016, rising by 9% in the two years to 6.7 million m^3 in 2018. More than three-quarters of world imports of tropical plywood were by countries outside the UNECE region (ITTO, 2019; Comtrade, 2019).

Tropical plywood comprises more than 62 percent of Japan's total plywood imports. The country's tropical plywood imports amounted to 1.8 million m^3 in 2017 and 1.9 million m^3 in 2018, recovering from a record low of 1.6 million m^3 in 2016. Imports picked up in 2017 in response to steady housing demand and low inventories of imported plywood; the increase in 2018 was influenced by the anticipated effects on housing prices of a rise in the consumption tax in 2019. About 50% of imports were sourced from Malaysia in 2018 and 44% from Indonesia. The remainder was imported mainly from China and Viet Nam (ITTO, 2019; Comtrade, 2019).

Japan's domestic tropical plywood industry continues to contract. Significant production curtailment and plant closures have occurred in recent years because of the restricted supply of Southeast Asian logs, which have also increasingly been diverted to other markets, such as China and India. Japanese plywood mills now predominantly use domestic peeler logs rather than Southeast Asian logs, and there has been considerable substitution of tropical plywood by softwood plywood and other panel products. Although tropical plywood demand is expected to increase in 2019 in response to investment in infrastructure for the Olympic Games in 2020 and rehabilitation work in the wake of disasters, this will be constrained by a declining population and continued substitution with domestic plywood as Japan targets 51% self-sufficiency in roundwood supply by 2025.

As in previous years, Indonesia and Malaysia were the dominant tropical plywood exporters in 2018, together supplying 73% of world exports. Malaysia's exports have been affected by a chronic log shortage, however, due mainly to policies aimed at achieving sustainable forest management and to periodic poor weather and logistical problems that have restricted the supply of peeler logs to domestic plywood

TABLE 6.5.1

Major global importers and exporters of tropical plywood, by volume, 2016-2018 (thousand m^3)

	2016	*2017*	*2018*	*Change (%) 2017-2018*
MAJOR IMPORTERS				
Japan	1,627	1,810	1,916	5.9
Republic of Korea	754	973	973	0
US	705	582	863	48.3
Taiwan Province of China	381	335	335	0
Malaysia	216	272	247	-9.2
MAJOR EXPORTERS				
Indonesia	2,299	2,330	2,348	0.8
Malaysia	2,489	2,494	2,336	-6.3
China	606	806	675	-16.3
Viet Nam	356	477	477	0

Source: ITTO, 2019; Comtrade, 2019.

mills. Although log-export restrictions have been imposed in the Malaysian state of Sabah since May 2018, there has been no significant increase in the supply of peeler logs to the domestic plywood industry. Plywood export prices rose in 2018 in response to increased raw-material and labour costs.

China's exports of tropical plywood picked up between 2014 and 2017, reaching 806,000 m^3 in 2017. Exports dropped by 16% in 2018, however, to 675,000 m^3, in response to a significant decline in production as the industry adjusts to new environmental regulations.

Note: The statistical annex of the *Forest Products Annual Market Review 2018-2019* is available at: www.unece.org/forests/fpamr2019-annex

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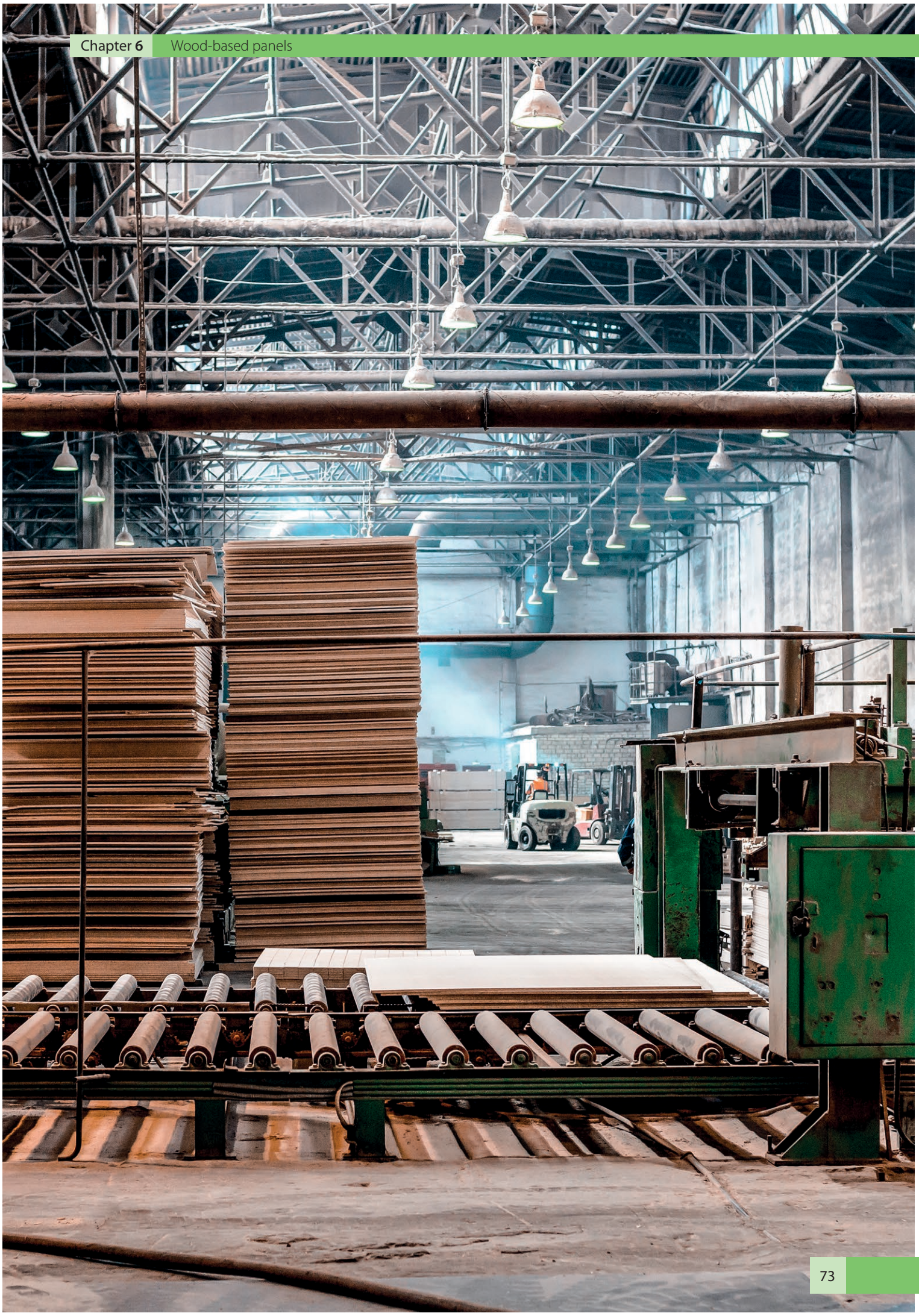

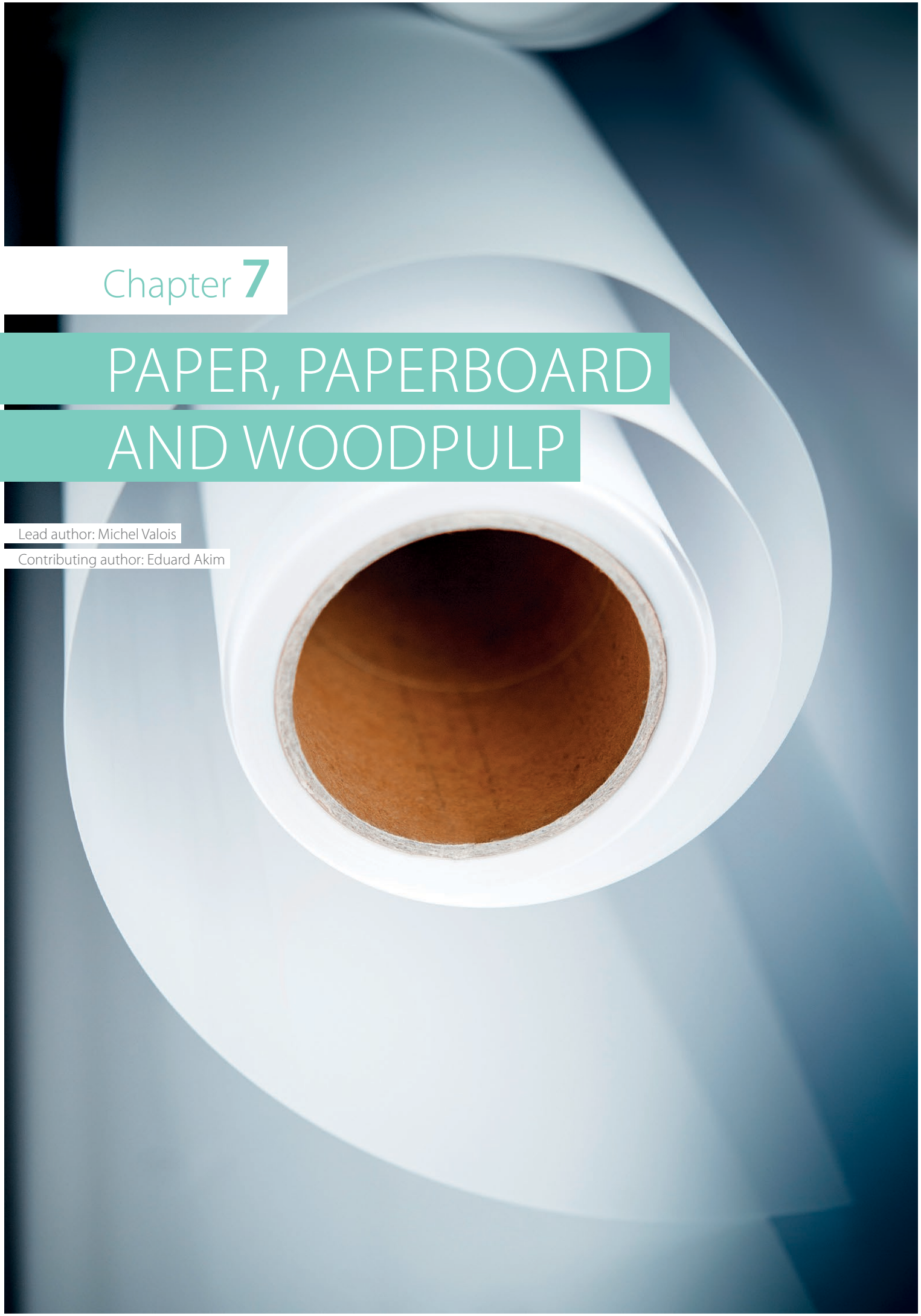

Chapter 7

PAPER, PAPERBOARD AND WOODPULP

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Highlights

Paper and paperboard production rose in the CIS (by almost 4%) in 2018, was flat in Europe and dropped slightly in North America.

Overall paper demand declined in the UNECE region by 1.2%, with packaging and tissue grades partially offsetting reduced demand for graphic grades.

Woodpulp production rose in Europe in 2018 due to increased demand and capacity but fell slightly in North America on unplanned downtime. Woodpulp production was higher in the CIS due to increased capacity and a weak Russian rouble.

The apparent consumption of woodpulp was stable in Europe and North America despite higher prices and declining graphic-paper demand. Woodpulp for the packaging, sanitary and household paper segments is increasingly being supplied from South America.

Graphic-paper capacity in the UNECE region fell by 1.4 million tonnes in 2018 and is expected to decline by another 4.4 million tonnes in 2019.

Graphic-paper production in North America fell by 1.74 million tonnes in 2018, an 8.4% decline from previous years due to higher prices; however, the higher prices, imposed to cover rising costs for pulp, energy and transportation, also caused a drop in demand (enabled by the ongoing shift to electronic communication).

The production of sanitary and household paper increased in all three UNECE subregions region in 2018; consumption increased significantly in the CIS but was flat in Europe and North America.

Prices for woodpulp rose in the first half of 2018, with strong demand prompting a flurry of buying as consumers tried to bear successive price increases. By the end of 2018, overcapacity driven by record high prices and falling graphic-paper demand and a weakening Chinese economy caused a price correction that continued into mid-2019.

China's recovered-paper imports fell by 34.8% in 2018, to 17.0 million tonnes, as customs officials enforced quality controls.

7.1 Introduction

The global pulp, paper and paperboard industry continued its resurgence in early 2018, driven by a much tighter supply–demand balance for woodpulp and continued strong demand for packaging and sanitary and household products. Prices for virtually all products rose throughout the UNECE region in 2018. By the middle of the year, however, signs of stresses had begun to appear in Asia (particularly China) and Europe as costs in the pulp and paper segments began to have a negative impact on apparent consumption.

The production and apparent consumption of graphic papers continued to decline in virtually every market in 2018 as end users reduced their advertising budgets for print media and swung towards electronic communication, including the Internet. The decline in the apparent consumption of graphic papers accelerated in early 2019 due to price increases. As paper producers saw orders declines, a growing number turned to producing pulp for the market as a way of filling machine time.

The apparent consumption of paper and paperboard fell slightly in the UNECE region in 2018, with Europe and North America both declining by just over 1% and the CIS increasing by 2.6% (graph 7.1.1).

Global chemical market-pulp capacity rose by 2.97 million tonnes (4.3%) in 2018 (Valois Vision Marketing, 2019a), with increases mainly in Asia and South America.

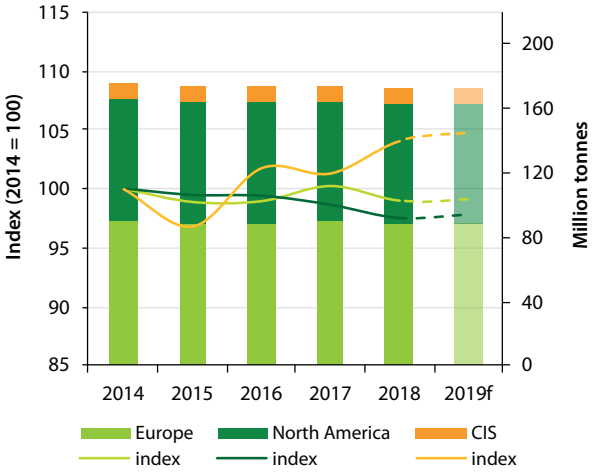
On the demand side, rising pulp prices and weaker apparent consumption in all regions for graphic papers allowed pulp consumers to build stocks. Market-pulp suppliers experienced a record inventory surge in the second half of 2018. The result was a gradual but sustained decline in market-pulp prices that persisted into mid-2019.

There was significant overcapacity in the graphic-paper sector throughout the UNECE region in 2018 as consumers continued to shift to electronic communication. Consequently, there were closures and conversions in all regions in both the newsprint and printing-and-writing subsectors. Graphic-paper capacity in the UNECE region fell by 1.4 million tonnes in 2018 and is expected to decline by another 4.4 million tonnes in 2019. Globally, 1.8 million tonnes of graphic-paper capacity was removed from production indefinitely or permanently in 2018, and a further drop of 6.5 million tonnes worldwide is expected in 2019 (Valois Vision Marketing, 2019b).

Paper and paperboard production was flat in Europe, the CIS had an almost 4% increase, and North America experienced a slight drop. The net result was that paper and paperboard production was flat in the UNECE region (graph 7.1.2). Woodpulp production and consumption followed similar trends, with essentially no overall change in production in the region; there was a notable increase in the CIS but almost no change in Europe and North America (graphs 7.1.3 and 7.1.4).

GRAPH 7.1.1

Apparent consumption of paper and paperboard, UNECE region, 2014-2019

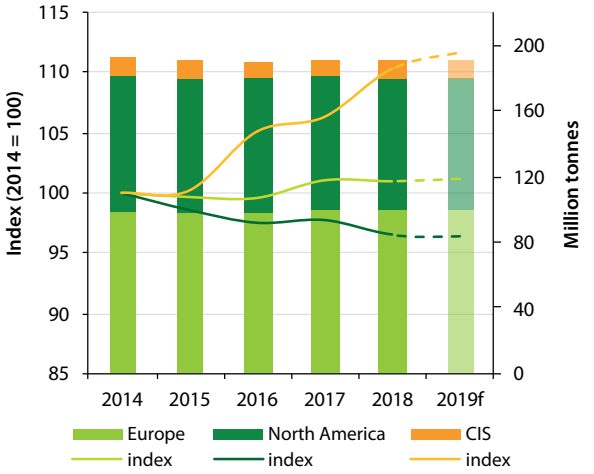


Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

GRAPH 7.1.2

Production of paper and paperboard, UNECE region, 2014-2019

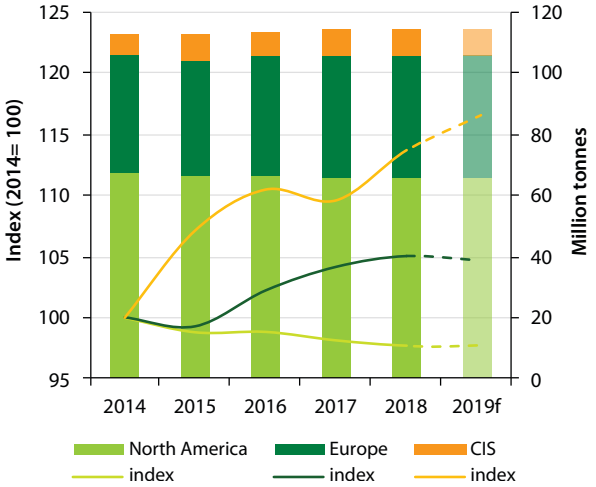


Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

GRAPH 7.1.3

Production of woodpulp, UNECE region, 2014-2019

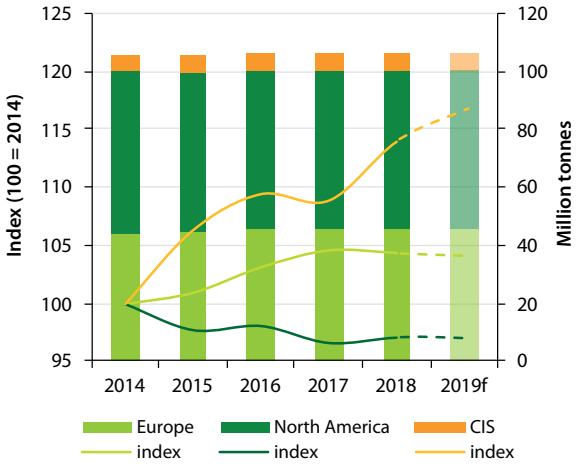


Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

GRAPH 7.1.4

Apparent consumption of woodpulp, UNECE region, 2014-2019



Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

7.2 Europe

7.2.1 Paper and paperboard production

Europe's production of paper and paperboard was essentially flat in 2018, at 99.1 million tonnes (table 7.2.1). Graphic-paper production fell by 3.0%, with newsprint showing the biggest fall (5.3%), followed by coated papers (3.5%). The production of paperboard (packaging material) rose by 1.4%, with conversion from newsprint fuelling much of the growth. Imports of paper and paperboard dropped by 1.0%, while exports increased by 0.7%. Europe has a positive trade balance in paper and paperboard. European paper and paperboard production, consumption, imports and exports are forecast to stay at roughly the same level as 2018 in 2019.

Announcements of price increases across most graphic grades driven by rising pulp and energy costs initially fuelled demand – mostly stock-building among commercial printers and merchants. The added paper cost burden to advertisers and end users eventually drove demand lower for graphic grades towards the end of 2018, however, pushing producers to take downtime or, for some, declare bankruptcy. This accelerated the decline in graphic-paper consumption, leading to a rise in paper-machine closures.

7.2.2 Paper and paperboard consumption and prices

Europe's apparent consumption of paper and paperboard edged 1.2% lower in 2018, with graphic papers declining by 4.0% led by a drop of 8.8% in coated papers. Rising paper costs for publication grades pushed consumers more quickly towards electronic advertising and communication.

There was a 2.7% decline in the apparent consumption of newsprint in 2018 due to lower circulations and advertising, including fewer page counts. There was a drop of about 1% in the consumption of uncoated wood-free and uncoated mechanical papers.

Paperboard apparent consumption was flat in 2018, with decreases in case materials and wrapping paper of 0.5% and 2.1%, respectively. Apparent consumption increased for cartonboard (+2.0%) and other papers (+1.8%).

7.2.3 Market and integrated pulp production

Total pulp production rose by 0.9% in 2018 (table 7.2.2) on stronger paperboard demand and despite weaker pull from the graphic-paper segments. Mechanical and semi-chemical pulp production was up by 2.6% and chemical production by 0.3%. Market-pulp production grew by 1.6%, driven by rising prices throughout much of the year as well as by an increase

TABLE 7.2.1

Production and apparent consumption of paper and paperboard, Europe, 2014, 2017 and 2018
(thousand tonnes)

	Production				Apparent consumption			
	2014	*2017*	*2018*	*Change (%) 2017-2018*	*2014*	*2017*	*2018*	*Change (%) 2017-2018*
Graphic papers	38,627	34,977	33,942	-3.0%	32,478	29,293	28,131	-4.0%
Newsprint	7,485	6,355	6,017	-5.3%	7,437	6,081	5,915	-2.7%
Uncoated mechanical	6,101	6,128	6,034	-1.5%	4,776	4,872	4,805	-1.4%
Uncoated wood-free	9,673	8,934	8,810	-1.4%	8,774	8,325	8,278	-0.6%
Coated papers	15,368	13,560	13,081	-3.5%	11,490	10,015	9,134	-8.8%
Sanitary and household papers	7,606	8,286	8,520	2.8%	7,586	8,217	8,258	0.5%
Packaging materials	48,170	51,490	52,189	1.4%	45,419	47,556	47,527	-0.1%
Case materials	27,928	30,140	30,586	1.5%	28,117	30,131	29,966	-0.5%
Cartonboard	10,433	11,185	11,390	1.8%	8,369	7,972	8,131	2.0%
Wrapping papers	5,396	5,415	5,410	-0.1%	4,764	4,928	4,824	-2.1%
Other papers, mainly packaging	4,414	4,749	4,802	1.1%	4,168	4,525	4,607	1.8%
Other paper and board	3,682	4,419	4,438	0.4%	3,879	4,499	4,549	1.1%
Total paper and paperboard	**98,085**	**99,171**	**99,089**	**-0.1%**	**89,361**	**89,565**	**88,465**	**-1.2%**

Sources: FAOSTAT, 2019; CEPI, 2019.

in market-pulp capacity (mainly in Finland and Sweden). List price levels reached record heights.

Europe's apparent consumption of woodpulp fell by 0.2% in 2018, in part due to high market-pulp prices and a decline in the production of graphic paper, cartonboard and wrapping papers.

Falling demand for printing and writing paper, and strong margins for chemical and mechanical pulp, enabled integrated mills to fill machine time by running pulp for the market. As demand for market pulp waned in the fourth quarter of 2018, however, the additional volumes from integrated players added to overcapacity, and price falls persisted to mid-2019.

TABLE 7.2.2

Woodpulp balance, Europe, 2017-2019
(thousand tonnes)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	39,715	40,058	39,903	0.9
Imports	21,102	21,003	20,996	-0.5
Exports	14,795	15,138	15,138	2.3
Apparent consumption	46,023	45,924	45,761	-0.2

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

7.2.4 Use of paper for recycling

The use of paper for recycling in member countries of the Confederation of European Paper Industries (CEPI)[8] rose by 0.4% in 2018, to 48.5 million tonnes.

7.3 The CIS subregion

7.3.1 Paper and paperboard production and apparent consumption

The pulp and paper industry is growing in the CIS with increased investment, and the production and consumption of all major pulp and paper products rose in 2018 (tables 7.3.1 and 7.3.2). Paper and paperboard production grew by 3.8% in the subregion, to almost 10.7 million tonnes. The Russian Federation accounted for a large part (9.0 million tonnes) of this.

TABLE 7.3.1

Paper and paperboard balance, CIS, 2017-2019
(thousand tonnes)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	10,339	10,730	10,854	3.8
Imports	2,591	2,675	2,631	3.2
Exports	3,410	3,633	3,657	6.5
Apparent consumption	9,520	9,772	9,827	2.6

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

7.3.2 Chemical woodpulp production and apparent consumption

Chemical woodpulp production was higher in the CIS in 2018 due to investments in incremental capacity. The weaker Russian rouble coupled with an increase in domestic capacity enabled a 1.2% increase in the subregion's pulp exports, to 2.14 million tonnes. The apparent consumption of chemical woodpulp was up by 3.6% in 2018, to 4.3 million tonnes (table 7.3.2).

8 Through its 18 member countries (Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom), CEPI represents 495 pulp, paper and paperboard companies in Europe.

TABLE 7.3.2

Chemical woodpulp balance, CIS, 2017-2018
(thousand tonnes)

	2017	*2018*	*Change (%) 2017-2018*
Production	6,021	6,193	2.9
Imports	224	228	1.5
Exports	2,113	2,139	1.2
Apparent consumption	4,133	4,282	3.6

Source: FAOSTAT, 2019.

7.3.3 Russian Federation - production and capacity

The production of pulp, paper and paperboard increased by 3.6% in the Russian Federation in 2018, to 17.6 million tonnes (FAOSTAT, 2019), following strong domestic and export demand. The annual trade balance for pulp, paper and paperboard was positive in 2018, at $2.2 billion. Exports of paper and paperboard reached $2.3 billion and imports $1.5 billion (FAOSTAT, 2019).

Russian production of pulp, paper and paperboard grew by 5.7% in 2018. Market pulp production increased by 3.0%, to 2.8 million tonnes and by 6.2% for newsprint (to 1.5 million tonnes).

Aided by rising prices across the pulp and paper segment in general, the value of Russian pulp and paper exports grew by 28% in 2018. The largest contributors to the higher export

TABLE 7.4.1

Production and apparent consumption of paper and paperboard, North America, 2014, 2017 and 2018
(thousand tonnes)

	Production				Apparent consumption			
	2014	*2017*	*2018*	*Change (%) 2017-2018*	*2014*	*2017*	*2018*	*Change (%) 2017-2018*
Graphic papers	24,343	20,772	19,032	-8.4	23,125	20,137	18,773	-6.8
Newsprint	5,939	4,251	3,960	-6.8	3,822	2,859	2,484	-13.1
Uncoated mechanical	3,433	2,905	2,745	-5.5	3,470	2,919	2,778	-4.8
Uncoated wood-free	8,538	8,175	7,366	-9.9	8,819	8,153	7,484	-8.2
Coated papers	6,433	5,442	4,961	-8.8	7,013	6,206	6,028	-2.9
Sanitary and household papers	7,427	7,675	7,689	0.2	7,540	7,831	7,862	0.4
Packaging materials	50,352	51,799	52,924	2.2	43,885	45,609	46,525	2.0
Case materials	33,949	35,553	36,942	3.9	29,796	31,079	32,139	3.4
Cartonboard	12,158	12,194	7,392	-39.4	10,539	11,125	10,987	-1.2
Wrapping papers	1,854	1,804	2,814	56.0	1,161	1,216	1,222	0.5
Other papers, mainly packaging	2,391	2,248	5,776	156.9	2,388	2,189	2,176	-0.6
Other paper and board	1,746	1,755	1,362	-22.4	1,504	1,460	1,046	-28.3
Total paper and paperboard	**83,868**	**82,003**	**81,006**	**-1.2**	**76,053**	**75,037**	**74,205**	**-1.1**

Sources: FAOSTAT, 2019; AF&PA, 2019; Valois Vision Marketing estimates.

value were market pulp (+37%), at $1.5 billion, kraft and test liners (+32%) and newsprint (+40%). Pulp exports exceeded 2.2 million tonnes in 2018.

7.4 North America – production and apparent consumption

North America's production of paper and paperboard was 1.2% lower in 2018, at 81.0 million tonnes (table 7.4.1). Closures of graphic-paper machines more than offset higher paperboard production. Imports increased by 3.1% and exports by 1.1%.

North America's apparent consumption of paper and paperboard continued its downward trend in 2018, declining by 1.1% to 74.2 million tonnes (table 7.4.1). Imports (including intrasubregional trade) are forecast to stay at about 12.2 million tonnes in 2019 and exports are expected to drop marginally, from 19.0 million to 18.7 million tonnes.

The subregion's production and consumption of paper and paperboard is forecast to continue at about the same level in 2019 as in 2018, with production steady at 81.0 million tonnes and consumption up slightly to 74.4 million tonnes.

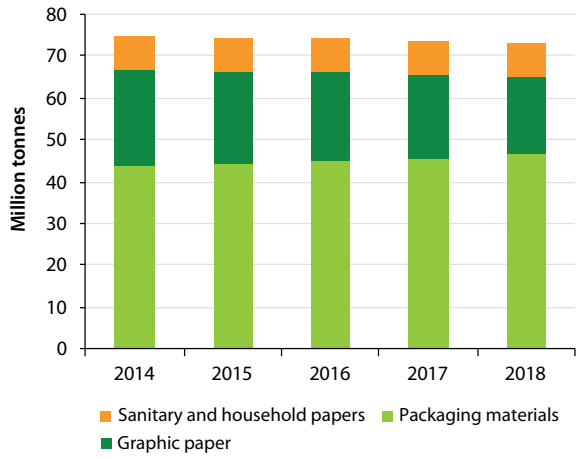
The production of graphic papers in North America fell by 8.4% in 2018 (table 7.4.1) as capacity was permanently removed due to falling demand and competition from imports. The production of packaging materials increased by 2.2% in 2018.

The production of newsprint fell by 6.8% in North America in 2018, to 4.0 million tonnes. Low prices and poor profitability resulted in capacity rationalization. Production dropped by 5.5% for uncoated mechanical paper (to 2.7 million tonnes), by 9.9% for uncoated wood-free paper (to 7.4 million tonnes), and by 8.8% for coated papers (to 5.0 million tonnes). The production of sanitary and household papers rose by 0.2%, to 7.7 million tonnes.

North America's apparent consumption of graphic paper dropped by 6.8% in 2018, to 18.8 million tonnes (table 7.4.1), as the digitalization of communication continued to negatively affect the sector. The apparent consumption of newsprint declined by 13.1% in 2018, to 2.5 million tonnes (35% less than in 2014). North America's apparent consumption dropped by 4.8% for uncoated mechanical paper (to 2.8 million tonnes), by

GRAPH 7.4.1

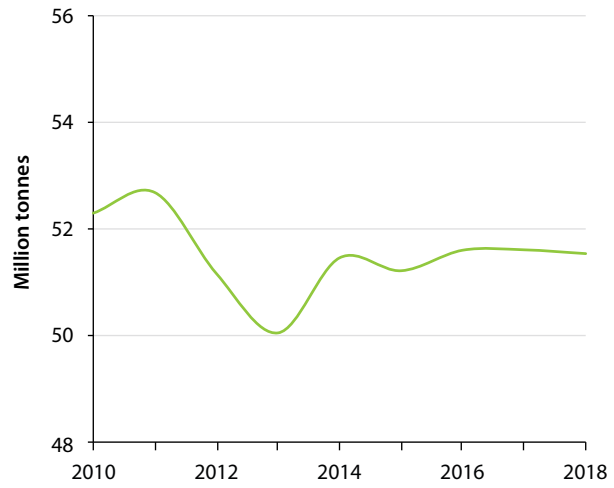
Apparent consumption of paper and paperboard, North America, 2014-2018



Source: FAOSTAT, 2019.

GRAPH 7.4.2

Production of chemical woodpulp, North America, 2010-2018



Source: FAOSTAT, 2019.

8.2% for uncoated wood-free paper (to 7.5 million tonnes), and by 2.9% for coated papers (to 6.0 million tonnes). Apparent consumption grew by 0.4% for sanitary and household papers (to 7.9 million tonnes) and by 2.0% for packaging materials (to 46.5 million tonnes) (graph 7.4.1). Apparent consumption fell by 1.2% for cartonboard (to 11.0 million tonnes) but increased by 3.4% for case materials (to 32.1 million tonnes) and by 0.5% for wrapping papers (to 1.2 million tonnes).

North American production of chemical woodpulp was down by 0.1% in 2018 (graph 7.4.2).

Demand from sanitary and household papers continued to grow with the addition of new capacity. The apparent consumption of chemical pulp grew slightly (+1.1%).

7.5 Extraregional influences affecting the UNECE region

7.5.1 South America

7.5.1.1 Brazil

Brazil produced 21.0 million tonnes of pulp (integrated and market) in 2018, up by 7.9% over 2017 (table 7.5.1), and 10.5 million tonnes of paper and paperboard, down by 0.2% (table 7.5.2). Higher pulp production was due mainly to

TABLE 7.5.1

Woodpulp balance, Brazil, 2017-2018
(thousand tonnes)

	2017	*2018*	*Change (%) 2017-2018*
Production	19,492	21,035	7.9
Exports	13,199	14,722	11.5
Imports	211	180	-14.7
Apparent consumption	6,504	6,493	-0.2

Source: Ibá, 2019.

TABLE 7.5.2

Paper and paperboard balance, Brazil, 2017-2018
(thousand tonnes)

	2017	*2018*	*Change (%) 2017-2018*
Production	10,477	10,452	-0.2
Domestic sales	5,466	5,491	0.5
Exports	2,114	2,017	-4.6
Imports	758	714	-5.8
Apparent consumption	9,121	9,149	0.3

Source: Ibá, 2019.

globally higher prices. Brazil exported 14.7 million tonnes of pulp in 2018 (table 7.5.1) (Ibá, 2019).

Brazil's pulp imports fell by 14.7% in 2018 (table 7.5.1), due mainly to higher domestic production of specialty fluff pulp and the national government's continued imposition of import duties on fluff pulp from the US.

Unlike pulp, most paper and paperboard produced in Brazil is consumed internally. Exports accounted for 19.3% of production in 2018, down from 20.2% in 2017 (table 7.5.2).

7.5.1.2 Chile

Chile's exports of pulp, paper and paperboard rose by 5.5% in 2018 (table 7.5.3), due mainly to increased demand and prices. Chile's aggregate pulp exports rose by 4.4%, to 4.7 million tonnes.

Newsprint exports grew by 12.3% in 2018 due to overseas paper-machine closures and conversions. Chile's paperboard exports were up by 16.0% on strong global demand.

Chile's exports of bleached radiata pine pulp increased by 5.7% in 2018, unbleached radiata pine pulp exports were up by 7.7%, and bleached eucalyptus kraft pulp exports rose by 2.4%.

TABLE 7.5.3

Pulp, paper and paperboard exports, Chile, 2017-2018
(thousand tonnes)

	2017	*2018*	*Change (%) 2017-2018*
Bleached radiata kraft	1,898	2,006	5.7
Bleached eucalyptus kraft	2,142	2,194	2.4
Unbleached radiata kraft	452	487	7.7
Newsprint paper	57	64	12.3
Paperboard	468	543	16.0

Source: Infor, 2019.

7.5.2 China

China experienced an economic slowdown in 2018 that had negative impacts on pulp and paper production and consumption. The country's pulp production fell by 9.4% in 2018 (table 7.5.4) and consumption was down by 6.6% as paper and paperboard mills took market-related downtime to cope with their large inventories of finished goods (Valois Vision Marketing, 2019c). China's total paper and paperboard production fell by 6.2% in 2018 due to this downtime. The consumption of paper and paperboard was 4.2% lower. However, China's total pulp imports grew by 4.6% in 2018, to 24.8 million tonnes (table 7.5.5).

TABLE 7.5.4

Production and apparent consumption of pulp, paper and paperboard, China, 2018 (thousand tonnes)

	Production		*Apparent consumption*	
	2018	*Change (%) 2017-2018*	*2018*	*Change (%) 2017-2018*
Pulp	72,010	-9.4	93,870	-6.6
Paper and paperboard	104,350	-6.2	104,390	-4.2

Note: Pulp figures include recovered paper pulp (production of 54.4 million tonnes including pulp from imported recovered paper).

Source: China Paper Association, 2019.

TABLE 7.5.5

Pulp imports, China, 2017-2018
(thousand tonnes)

	2017	*2018*	*Change (%) 2017-2018*
Kraft	19,242	20,034	4.1
Mechanical	1,796	1,541	-14.2
Dissolving	2,603	2,838	9.0
Other	65	389	498.5
Total	**23,707**	**24,803**	**4.6**

Source: China Customs Bureau, 2019.

TABLE 7.5.6

Recovered-paper imports, China, 2017-2018
(million tonnes)

	2017	*Share (%) of total*	*2018*	*Share (%) of total*
Imports in China	26.1	100	17.0	100
Of which from the US	10.8	41.4	7.8	45.6
US exports	18.3	100	19.1	100
Of which to China	10.8	59.1	7.8	40.7

Sources: China Customs Bureau, 2019; US Census Bureau, 2019.

China's recovered-paper imports fell by 34.8% in 2018, to 17.0 million tonnes, as customs officials enforced quality controls (table 7.5.6) (Valois Vision Marketing, 2019c).

7.6 Conclusion

The pulp, paper and paperboard industry in the UNECE region began to show signs of overcapacity in the woodpulp segment in 2018, while an ongoing decline in the apparent consumption of graphic papers caused market-pulp prices to falter towards the end of 2018.

The production and apparent consumption of paperboard continued to rise as the industry benefited from capacity rationalization, robust economies in the UNECE region and increased demand for packaging (driven largely by online shopping).

A slowdown in China's economic performance in 2018 fuelled by rising costs and trade tensions created an imbalance in the pulp, paper and paperboard segments. As a result, price weakness in China began to spread through economies in the UNECE region in late 2018, persisting to mid-2019.

Challenges facing the industry in the UNECE region include industry consolidation, ongoing cost-cutting initiatives, by both pulp, paper & paperboard producers and consumers, and investments in new products and niche markets, all while managing a rise in global trade tensions.

Note: The statistical annex of the *Forest Products Annual Market Review 2018-2019* is available at: www.unece.org/fpamr2019-annex

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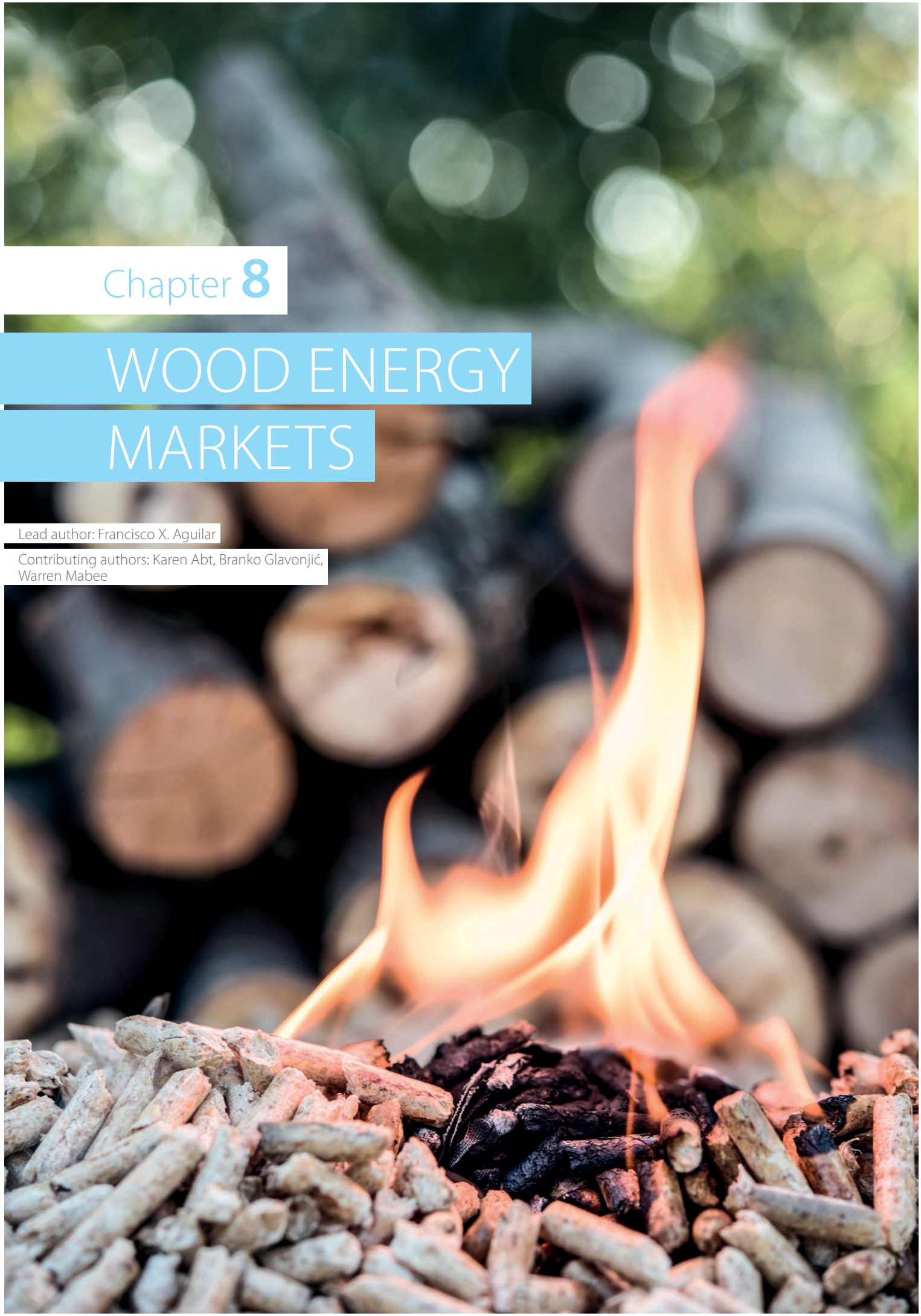

Chapter 8

WOOD ENERGY MARKETS

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Highlights

The apparent consumption of wood pellets reached nearly 25.4 million tonnes in the Europe subregion in 2018 and is projected to exceed 26.0 million tonnes in 2019.

Spot prices for wood pellets increased in Europe in 2018-2019, due partly to increased demand for biopower and unexpected halts and disruptions in supply.

ENplus-certified pellets represented an estimated 70% of the European wood pellet heating market in 2017.

The Russian Federation produced 1.8 million tonnes of wood pellets in 2018, 300,000 of which (17%) were sold domestically.

Most Russian pellet enterprises are located in the northwest; Siberia is now the Russian Federation's second-largest pellet producing region.

Canadian consumption of wood energy remains stable, with the dominant supply being solid wood waste and spent pulping liquor.

Canada's newly released Clean Fuel Standard – designed to reduce greenhouse-gas emissions by 30 million tonnes of CO_2 equivalent per year by 2030 – could increase the country's use of biofuels.

Wood pellets accounted for 8.5% percent of the total value of US wood product exports in 2018.

Almost all (more than 99%, by volume) wood pellets exported by the US in 2018 originated in the US South.

8.1 Introduction

Wood energy consumption changed little overall in the UNECE region in 2018. The trans-Atlantic trade of wood pellets reached new heights, however, and continues to dominate the international woodfuel trade. A combination of increased demand and slower-than-expected growth in operative production capacity led to higher prices for industrial wood pellets. The emergence of Asian utility wood pellet markets may offer an opportunity for market expansion in UNECE countries.

In 2018, European Union Directive 2018/2001 set new renewable energy targets for meeting commitments made in the Paris Agreement on climate change and outlined conditions for the sustainable procurement of forest biomass. Canada's Clean Fuel Standard could spur the increased use of forest-based biofuels there. US federal agencies are working on the adoption of consistent federal policies to promote the use of forest biomass as a carbon-neutral form of bioenergy.

8.2 Europe

8.2.1 Consumption and production

Primary energy production derived from solid biofuels in the EU28 was 3,986 PJ in 2017, up by 1.5% from 2016 (Eurostat, 2019a). Total primary energy production from solid biofuels grew by 30.7% in the EU28 in the ten years from 2007 to 2017. Imports comprised 9.4% of total primary energy production from solid biofuels in 2017 (graph 8.2.1).

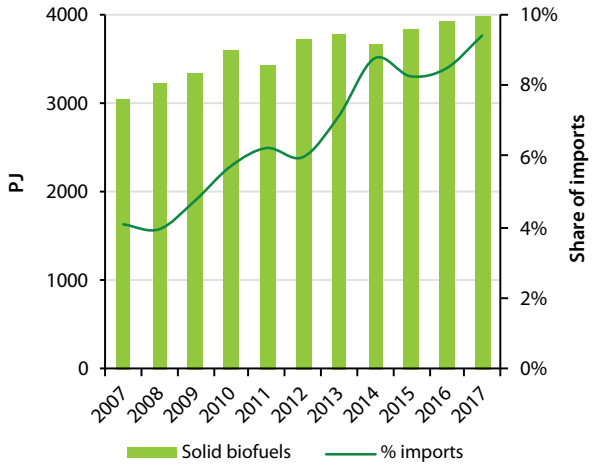
According to Poore (2019), European wood-pellet-based power-plant generation capacity exceeded 6 thousand MW in 2018 and is forecast to surpass 8 thousand MW by 2020. Total wood-pellet-based power-plant capacity exceeded 3 thousand MW in 2017. European wood pellet production reached 18.0 million tonnes in 2018. Germany is the largest producer of wood pellets in the EU, supported by a strong domestic heating market (Bioenergy Europe, 2018). Sweden, the second-largest producer, almost exclusively makes high-quality ENplus A1-class pellets. The production of ENplus A-1 pellets for the European residential heating market also continues to grow in Latvia, the EU's third-largest wood pellet producer. European apparent consumption of wood pellets for heating reached 15.7 million tonnes in 2018, up by 3.5% from 2017 (Poore, 2019). Europe's total apparent consumption of wood pellets in 2018 was 25.4 million tonnes (Table 8.2.1).

TENplus certification has expanded significantly since it was launched in seven countries in 2011 (ENplus, 2019), and about 10 million tonnes of ENplus-certified wood pellets were produced in 45 countries globally in 2018. Bioenergy Europe (2018) estimated that ENplus-certified pellets accounted for 70% of the European wood pellets heating market in 2017.

In the Western Balkans[9], wood energy consumption increased by 6.5% in 2018, to 220.3 PJ. The consumption of wood chips reached 876,000 tonnes, an increase of 8.5% compared with 2017. Croatia led this consumption, with 39% of the total share. Firewood consumption in the Western Balkans grew by 1.2% in 2018, to 21.2 million m^3. After years of growth, however, the consumption of wood pellets dropped by

GRAPH 8.2.1

Total EU28 primary energy production from solid biofuels, and share of imports, 2007-2017



Note: Excluding charcoal.

Source: Eurostat, 2019a.

TABLE 8.2.1

Wood pellet balance, Europe, 2017-2018
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	16,911	17,140	18,020	1.4
Imports	15,445	17,379	17,702	12.5
Exports	8,215	9,126	9,707	11.1
Apparent consumption	24,141	25,393	26,016	5.2

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

9 The Western Balkans include: Albania, Bosnia and Herzegovina, Croatia, North Macedonia, Montenegro, Serbia and Slovenia.

1.5%, to 871 thousand tonnes, due to a decline in Serbian consumption.

The production of woodfuels levelled off in the Western Balkans in 2018 at an energy-equivalency value of 273.1 PJ (an increase of 0.5% compared with 2017), but the production of wood chips for energy increased by 10.6%, to just over 1.5 million tonnes. The production of wood briquettes also increased, by 3.4%, firewood production was relatively flat at just more than 25 million m^3, and wood pellet production dropped by 1.2%, to 1.2 million tonnes. Serbia's largest wood pellet producer completed construction of the country's first dedicated wood-fuelled combined-heat-and-power plant in March 2019, with an installed capacity of 2.4 MWe and 8.2 MWth.

8.2.2 Prices

Argus Media (2019) reported that cost, insurance and freight (CIF) spot prices for industrial wood pellets at Amsterdam, Rotterdam and Antwerp increased steadily in 2018 and through February 2019 (graph 8.2.2), with the highest annualized growth (above 50%, year-on-year) in January 2018. Poore (2019) attributed the price increase partly to growth in European wood pellet demand throughout the year: for example, new biopower facilities in Demark (Orsted) and the Netherlands (RWE & Uniper) added new demand of about 2.25 million tonnes per year. Higher prices have also been a function of delays in manufacturing facilities, supply disruptions and shortfalls in expected production. The latter set of challenges made European buyers more reliant on the spot market, thereby creating new price pressures.

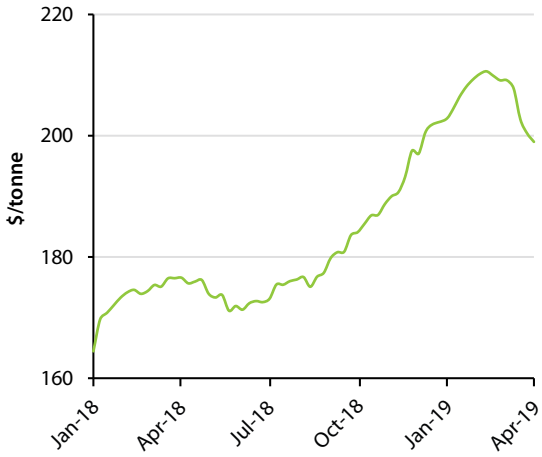
Prices for firewood increased in the Western Balkans in 2018. Wood pellets were more variable, however, with prices in Serbia below the levels achieved in late 2017 and 26.8% less than those in Slovenia in late 2018 (graph 8.2.3).

8.2.3 Trade

European wood pellet imports continue to grow. The volume exceeded 17 million tonnes in 2018, up by 1.9 million tonnes

GRAPH 8.2.2

Wood pellet prices at Amsterdam, Rotterdam and Antwerp, January 2018-April 2019

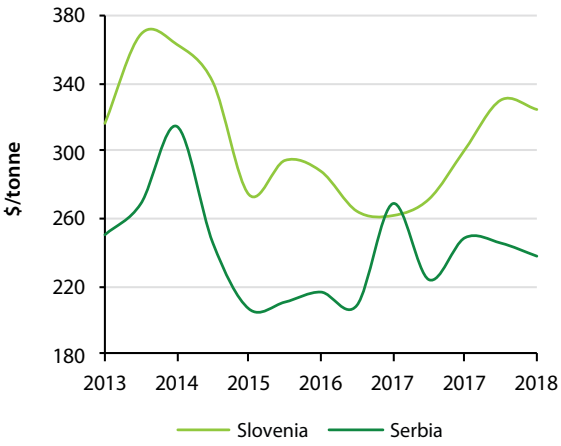


Note: Spot CIF prices within 90 days.

Source: Argus Media, 2019.

GRAPH 8.2.3

Wood pellet market prices in Serbia and Slovenia, 2013-2018



Note: The yearly data points are March and October, except for 2017 when the data points are February, March and October.

Source: Glavonjić, 2019; Slovenian Forestry Institute, 2019.

(12%) compared with 2017 (FAOSTAT, 2019). Nearly 60% (by weight) of imports into the EU28 from outside the EU were from the US, followed by Canada (17%) and the Russian Federation (13%). The trade of wood pellets within the EU28 exceeded 7.7 million tonnes in 2018 (Eurostat, 2019b).

Wood energy exports from the Western Balkans increased by 2.9% over 2017, to 45.5 PJ, which was 16.7% of production.

These exports included 2.0 million m^3 of firewood, 841 thousand m^3 of wood chips and 753 thousand tonnes of wood pellets (Comtrade, 2019).[10] Western Balkan imports of wood pellets increased by 25% in 2018, to 123 thousand tonnes (primarily from Belarus, the Russian Federation and Ukraine).

8.3 The CIS subregion

Fuelwood is the primary form of wood energy consumed in the CIS, where many rural areas lack access to natural gas and other forms of affordable energy.

Fuelwood consumption and production are notoriously underestimated in the UNECE region, including the CIS, because a large proportion of fuelwood gathering is done informally. For example, official forestry data for Tajikistan indicate that fuelwood production and consumption amount to about 90 thousand m^3; a recent official study involving household surveys, however, estimated production and consumption at 7.7 million m^3, nearly 86 times more (TAJSTAT, 2018).

As stated previously in chapter 2, Russian citizens are now allowed to collect deadwood in forests for their own needs (Deutsche Welle, 2019). An estimated 47 million m^3 of woodfuel is removed from forests in the CIS subregion annually, mainly for local use: less than 5% of the woodfuel harvest is traded internationally.

According to the Energy Balance of Ukraine issued by the State Statistics Service of Ukraine, the share of renewable energy sources in the country's total primary energy supply was 4.4% in 2017 (up from 3.8% in 2016). Biofuels and waste (both mainly wood-based) accounted for more than 80% of renewable energy production in 2017, increasing by 8%, year-on-year, to 3,618 ktoe. About 15% of these biofuels and waste were exported and the remainder was consumed domestically.

8.3.1 Consumption and production

In contrast to traditional fuelwood markets, the production and trade of wood pellets are highly dynamic. Wood pellet production increased by 11.5% in the CIS in 2018 and is expected to increase by another 3.8% in 2019 (table 8.3.1). The largest portion of the production (as well as of the increase in production) is in the Russian Federation.

According to WhatWood (2019), the Russian Federation produced 1.8 million tonnes of wood pellets in 2018, 300 thousand tonnes of which (about 17%) was sold domestically.

10 Moisture content is commonly 20-40% for firewood and wood chips and less than 8% for wood pellets.

TABLE 8.3.1

Wood pellet balance, CIS, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	2,399	2,676	2,779	11.5
Imports	9	11	11	22.9
Exports	1,890	2,170	2,348	14.8
Apparent consumption	518	518	442	0.0

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

The total capacity of all Russian wood pellet plants increased slightly in 2018, to an estimated 3.6 million tonnes of finished product. Most of the pellet enterprises are in the northwest. Siberian wood pellet producers became more active between 2016 and 2018; today, Siberia is the Russian Federation's second-largest pellet producing region. Production in the Far East has good potential to grow, due primarily to the attractiveness of exports to Asia (WhatWood, 2019). In addition, the classification of wood pellets as high-tech products allows Russian producers to receive compensation for transportation when selling for export (USDA Foreign Agricultural Service, 2018). The Irkutsk region of the Russian Federation contains one of the largest forest complexes in the country and is actively developing wood pellet production despite a lack of shipping options.

8.3.2 Prices

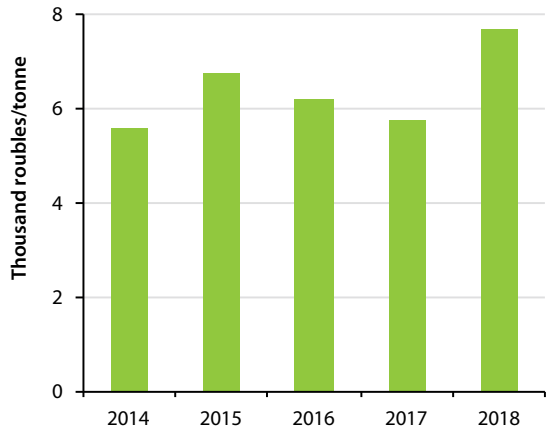
The average export price for pellet was 7,700 roubles per tonne in 2018 (FAOSTAT, 2019). The average price (denominated in roubles) increased by 25% in 2018, due to favourable export markets and a weakening rouble (down by 12% against the euro in 2018, compared with 2017) (graph 8.3.2) (WhatWood, 2019; FAOSTAT,2019).

8.3.3 Trade

Of the 2.7 million tonnes of wood pellets produced in the CIS in 2018, more than 80% (2.2 million tonnes) were exported. The main destinations for wood pellets exported from the Russian Federation were Denmark (669 thousand tonnes), Sweden (150 thousand tonnes) and Italy (147 thousand tonnes). About 64% of Russian export pellets went to these three countries, with the market in Italy growing by 136% (by volume) since 2016 (Trade Data Monitor, 2019). The Republic of Korea imported a similar quantity of wood pellets as Sweden in 2016 and 2017, but its imports from the Russian

GRAPH 8.3.1

Export prices for wood pellets in the Russian Federation, 2014-2018



Source: FAOSTAT, 2019.

Federation fell by 50% in 2018, due mostly to the production difficulties of a key supplier, (WhatWood, 2019). Wood pellets from the Russian Far East are struggling for market share in the Republic of Korea in competition with lower-priced pellets from Viet Nam, Malaysia, Indonesia and Thailand (in descending order by market share).

8.4 North America

8.4.1 Consumption and production

In Canada, the majority of wood energy generated in 2017 was from solid wood waste, including bark and wood-processing residues (12.1 million tonnes) and pulping liquor consumed in recovery boilers (17.9 million tonnes); this is expected to continue through 2018 (Statistics Canada, 2019a). Canada's consumption of wood pellets in 2018 was about 18% of the country's production of 3.0 million tonnes. The production of fuelwood has declined in recent years and was 2.05 million m^3 in 2018 (FAOSTAT, 2019).

Wood energy production and consumption were little changed in the US in 2018. The US Department of Energy's short-term projections indicate a small decrease in the industrial[11] use of wood for energy, a small increase in electricity-sector use over the next two years, and no change in other commercial[12] uses (US DOE EIA, 2019b). Residential use is projected to increase from 2018, but overall total wood energy consumption is projected to decline by 3.3% between 2018 and 2020. Data on US residential wood

11 The industrial sector mainly comprises the wood product and pulp and paper industries.

12 The commercial sector includes service-providing facilities such as stores, schools and restaurants.

TABLE 8.4.1

Trends in various US wood energy production and consumption measures, 2012-2018

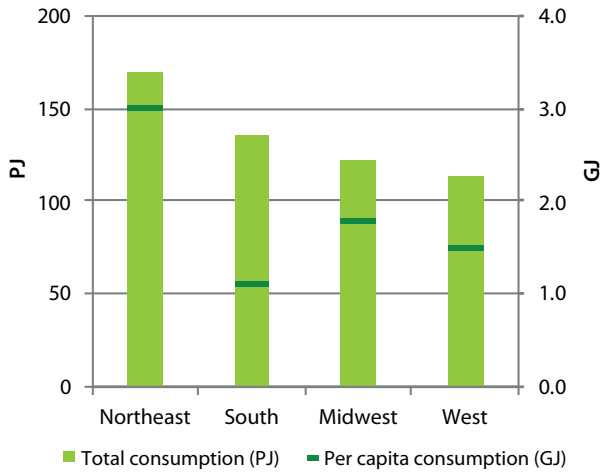
	2012	2013	2014	2015	2016	2017	2018
Pellets as a percent of total wood product exports, by value[1]	3.2	4.3	5.5	7.9	7.0	7.0	8.5
Percent of wood pellets exported from southern ports, by volume[1]	98.3	99.0	98.2	99.4	99.7	99.5	99.6
Percent of US wood pellet exports to the Republic of Korea and Japan, by volume[1]	0.0	1.2	1.4	0.1	1.1	0.2	0.1
Percent of US South pellet production that is premium or standard[2]	…	…	…	…	4.6	4.6	3.7
Percent of US production of utility pellets[2]	…	…	…	…	76.0	79.0	80.0
Percent of housing units using wood as primary source of energy for heating[3]	2.1	2.1	2.1	2.0	1.9	1.8	…

Note: … = not available.

Sources: [1] USITC, 2019; [2] US DOE EIA, 2019a – survey did not begin until 2016; [3] US DOC BOC (2018).

GRAPH 8.4.1

Per capita residential wood energy consumption for primary and secondary heating, by US Census region



Source: US DOC BOC, 2018.

energy consumption point to differing trends. The American Community Survey (ACS) showed that the absolute number of housing units and the percentage of all housing units using wood as the primary heat source have declined since 2012 (table 8.4.1; USDOC BOC, 2018). In contrast, the Residential Energy Consumption Survey (RECS) suggested an increase in residential wood energy consumption (US DOE EIA, 2018). The methodology for assessing wood energy consumption changed slightly between 2009 and 2015 – for example, the 2015 survey included the use of wood for secondary heating, but this was not included in earlier RECS and ACS estimates, making trends difficult to assess.

Graph 8.4.1 shows residential wood energy consumption in 2015 by US Census region as a share of US total consumption and in energy per capita. The Northeast region, with its cold winters, uses more wood for heating overall and per capita than do the South and West regions (where the weather is milder) and the Midwest region (which often has limited fuelwood availability). Projections for an increase in residential use in the US Department of Energy's Short-Term Energy Outlook (US DOE EIA, 2019b) after 2018 contradict recent declines in residential use but are predicated on a forecast of winters colder than 2018.

North American wood pellet production reached 10.5 million tonnes in 2018 and is expected to exceed 11 million tonnes in 2019 (table 8.4.2). Additional growth is expected to come from new and restarting operations, including, in the US, the German Pellets facility in Woodville, Texas, and Enviva Wilmington Holdings in Hamlet, North Carolina; and, in Canada, Pinnacle's facilities in Entwistle, Alberta, and Smithers in British Columbia (German Pellets 2019; Pinnacle 2019a, b).

There has been a slight shift in pellet production strategy in the US South, where pellet mills that previously produced for the domestic market have been converted to large-capacity utility pellet production (US DOE EIA, 2019a). This trend is reflected in a drop in the share (by weight) of premium pellets produced in the US South, from 4.6% in 2017 to 3.7% in 2018. The US South was hit by Hurricanes in September 2018, which disrupted wood pellet production and exports.

8.4.2 Prices

Table 8.4.3 shows wood energy prices in North America in the period 2016-2019.

8.4.3 Trade

The majority of Canadian wood pellet production is exported, with total exports reaching 2.65 million tonnes in 2018. The largest export destinations are the UK (1.58 million tonnes), Japan (0.62 million tonnes) and the US (0.22 million tonnes); these destinations accounted for 91% of Canadian wood pellet exports in 2018. The Netherlands was a new export destination for Canadian wood pellets, taking in 0.06 million tonnes in 2018. Minimal exports of fuelwood (0.02 million tonnes) and charcoal (0.09 million tonnes) were reported in 2017, and this was expected to continue through 2018 (FAOSTAT, 2019). Imports of wood energy products into Canada were negligible in 2018, except for 0.02 million tonnes of wood pellets, primarily from the US (Statistics Canada, 2019b).

In value terms, exports of wood pellets (HS 440131) grew from 3.2% of total US wood product exports (HS 44) in 2012 to 8.5% in 2018 (USITC, 2019). These exports were sourced mainly from forestland in the US South, with 99.6% of the

TABLE 8.4.2

Wood pellet balance, North America, 2017-2019
(thousand m^3)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
Production	9,806	10,517	11,349	7.3
Imports	231	241	241	4.2
Exports	7,375	8,668	9,380	17.5
Apparent consumption	2,661	2,089	2,210	-21.5

Note: f = 2018 Committee on Forests and the Forest Industry forecast.

Source: FAOSTAT, 2019.

total volume shipped from southern ports in 2018 (USITC, 2019; see table 8.4.1).

Policy restrictions in Japan and the Republic of Korea have reduced expectations that Asia will increase its imports of North American wood pellets; as of end 2018, exports to these markets constituted only a small share of total US wood pellet exports (USITC, 2019). The impact of Japan's policy on wood pellet imports could be especially significant for Canada: Japan has grown in recent years as an export destination for Canadian wood pellets to become the second-largest (behind the UK), constituting about 28% of Canadian exports (by volume) in the first quarter of 2019 (Statistics Canada, 2019b). A lack of growth in the Japanese market would affect Canadian production in coming years if no other markets can be developed.

8.5 Policy, standards and regulatory influences

The EU's revised Renewable Energy Directive (RED II, 2018/2001/EU) entered into force in December 2018 (European Commission, 2019). The aim of this regulation is to help the EU meet its emission-reduction commitments under the Paris Agreement on climate change by establishing a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023. EU countries must draft ten-year national energy and climate plans for 2021-2030 outlining how they will meet the new 2030 targets. During this process, EU member states should consider the available sustainable supply of biomass and avoid unnecessary distortions of raw-material

TABLE 8.4.3

Wood energy product prices, North America, 2016-2019

	unit	*2016*	*2017*	*2018*	*2019**
CANADA					
Bagged wood pellets for domestic use	$/mt	211-294	189-245	221-266	213-264
Wood pellet exports	$/mt FOB	132	135	143	140
Fuelwood ("firewood") exports	$/mt FOB	166	166	167	167
Fuelwood ("firewood") for domestic use	$/cord*	81	66	65	71
US					
Pellets, domestic average†	$/mt FOB	177	166	169	181
Pellets, export average†	$/mt FOB	164	152	185	179
Domestic wood pellets, retail	$/mt (bulk)	248-292	263-275	287-325	298-314
Domestic wood pellets, retail (super premium, bulk)	$/mt (bulk)	309-331	274-297	303-336	298-320
Northeast wood pellets, retail (premium, bagged)	$/mt	327	287	320	321
Northeast wood pellets, retail (premium, bulk)	$/mt	287	282	287	299

Notes: * Data are for spring 2019; prices are for US pellets in domestic and export markets based on January and February 2019 monthly data. ** Data are based on the average price per cord (shortwood), assuming a mass of 2.0865 tonnes per cord and a moisture content of 25%. † Average moisture content of US pellets in 2018 was 6.2% for exports and 4.5% for domestic uses. A cord is a unit of measure of stacked wood (wood, bark and void space) occupying a space of 128 cubic feet (3.625 m^3). The solid-wood content of a cord varies but is often assumed to be 66.7% wood, 11.5% bark and 21.8% void.

Sources: BT Enterprises, 2019; US DOE EIA, 2019a; State of Massachusetts Office of Energy and Environmental Affairs, 2019; FAOSTAT, 2019; Statistics Canada, 2019b.

markets. Specific to forest biomass, RED II notes that biofuels, bioliquids and biomass fuels produced from forest biomass should minimize the risk of unsustainable practices. To this end, countries in which forest biomass is harvested for such purposes should have relevant laws as well as monitoring and enforcement systems to ensure: (1) legality; (2) forest regeneration; (3) the conservation of protected areas; (4) the minimization of harvesting impacts; and (5) the maintenance or improvement of long-term land productivity. If country-level information is unavailable, a management system should be put in place at the level of forest sourcing areas to ensure that the above five criteria are met. To ensure the sustainable harvesting of biomass, RED II requires the regeneration of harvested areas, special attention for areas designated for protective purposes, the conservation of biodiversity, and the tracking of carbon stocks. Thus, primary-sourced forest biomass should be harvested following sustainable forest management principles implemented through national laws or best management practices at the level of sourcing areas. Operators should take appropriate steps to minimize the risk of using unsustainable forest biomass for the production of bioenergy. RED II has also introduced wording regarding the decarbonization of the heating-and-cooling sector and set a non-binding target to increase the share of renewable energy by 1.3 percentage points per year.

Within the European bioenergy landscape, operators producing energy from biomass will have to comply with sustainability requirements for solid and gaseous biomass. RED II targets installations above 20 MW fuel capacity with compliance requirements, but EU member states may change this threshold. For administrative and harmonization reasons, regional groups such as Bioenergy Europe (2018) advocate that all member states keep the 20 MW threshold.

The most important Canadian policy development is the release of the Clean Fuel Standard, which is designed to reduce national GHG emissions by 30 million tonnes of CO_2 equivalent by 2030 by reducing the greenhouse-gas intensity of solid, liquid and gaseous fuels. Biofuels and all other non-fossil fuels will not have a carbon-intensity compliance obligation, although the regulatory framework for the Clean Fuel Standard will consider indirect land-use change associated with increased biofuel use (ECCC, 2018). It is expected that fuelwood, wood pellets and other biofuels will benefit from increased market demand as the Clean Fuel Standard takes effect. Draft regulations were published in summer 2019 and the final regulations will come into effect in 2020 (ECCC, 2018). In addition, carbon pricing has been implemented across Canada at C$20 per tonne. As with the Clean Fuel Standard, this price is not applied to bioenergy sources, which should help drive the uptake of wood energy options (Wollnetz, Hein and Moawad, 2019).

Catastrophic wildfires in the US in 2017 and 2018, especially in California and in developed areas in and adjacent to National Forests, caused the deaths of 143 civilians and 8 firefighters; the destruction of thousands of structures; and the burning of more than 1.3 million ha. This has led to a new push by the administration for an increase in both timber removals and fuel treatments aimed at reducing wildfire. In a letter to the US Congress in November 2018, the heads of the US Environmental Protection Agency, the US Department of Agriculture and the US Department of Energy described the ways in which these agencies work to ensure consistent federal policy on forest biomass energy and promote policies that encourage the treatment of biomass as a carbon-neutral energy source (Wheeler, Perdue and Perry, 2018).

Outside the UNECE region, the Republic of Korea and Japan have become important in the global wood pellet market, importing 3.5 million tonnes and 1.1 million tonnes of wood pellets, respectively, in 2018 (Poore, 2019). These quantities are below experts' expectations, however, partly due to domestic public policies.

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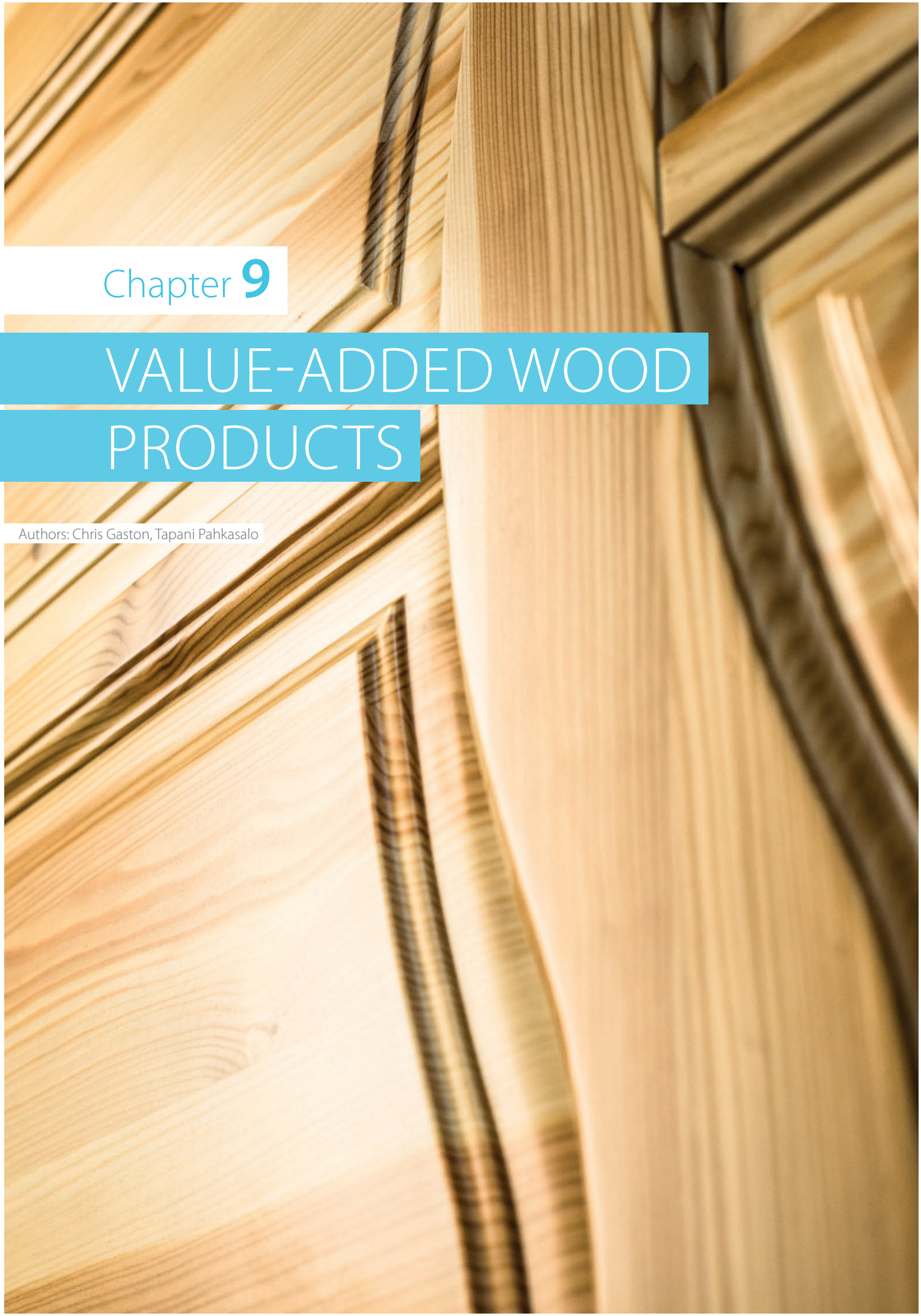


Chapter 9

VALUE-ADDED WOOD PRODUCTS

Authors: Chris Gaston, Tapani Pahkasalo

Highlights

Increasing e-commerce volumes of furniture are causing changes in the strategies of smaller furniture retailers, such as shortening delivery times, focusing on a smaller number of trendy items and often low-priced furniture.

A desire for healthy materials and air-quality improvements is driving many home-improvement projects in the US. Solid wood products are a clear winner in this development.

The largest importers of wooden furniture globally are the US, Germany, the UK, France and Japan (in descending order, by value, in 2018). The largest furniture exporters are China, Germany, Poland, Italy and Viet Nam.

Uncertainty over China-US trade talks is driving furniture manufacturers to diversify away from China, with capacity expanding in Viet Nam and Mexico.

Global furniture production amounted to $470 billion in 2018, and the furniture trade volume was estimated at $150 billion. Industry expectations are for another year of stable growth in 2019.

US wooden furniture imports reached $22 billion in 2018, more than doubling in value compared with the low reached during the global financial crisis in 2008-2009. China is still the largest trading partner in the US market, accounting for almost half (47%) of all wooden furniture imports.

Annual growth in US home improvement and repair expenditure is projected to drop below its long-term trend by 2020, from 7.0% currently to 2.6%.

Austria exported 1.8 million m^3 of glulam and cross-laminated timber (CLT) in 2018, with Italy importing about 650,000 m^3 of this, followed by Germany (415,000 m^3), Switzerland (140,000 m^3) and Japan (the only major importer of Austrian CLT outside Europe) (122,000 m^3).

The global CLT market was valued at $603 million in 2017 and is projected to reach $1,606 million in 2024.

Overall production of North American glulam declined from 750,000 m^3 in 2006 to 285,000 m^3 in 2009 but has rebounded since, reaching 468,000 m^3 in 2018.

Demand for wooden I-beams declined dramatically in North America after 2005, but production has grown significantly in recent years, more than doubling from 115 million linear metres in 2009 to a forecasted 234 million linear metres in 2019.

Laminated veneer lumber (LVL) production and consumption decreased slightly (by 2.4%) in North America in 2018, to 2.22 million m^3, and a further slight decline (to 2.21 million m^3) is predicted in 2019.

9.1 Introduction

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 and market developments are closely linked to drivers such as economic growth, trends in housing and construction, 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; shakes and shingles; and products that fall into the category of EWPs. EWPs include I-beams (also called I-joists); finger-jointed sawnwood; glulam (sawnwood glued into beams); laminated veneer lumber (LVL); and cross-laminated timber (CLT). Profiled wood is wood shaped by machines, such as mouldings, tongue-and-groove, and lap siding.

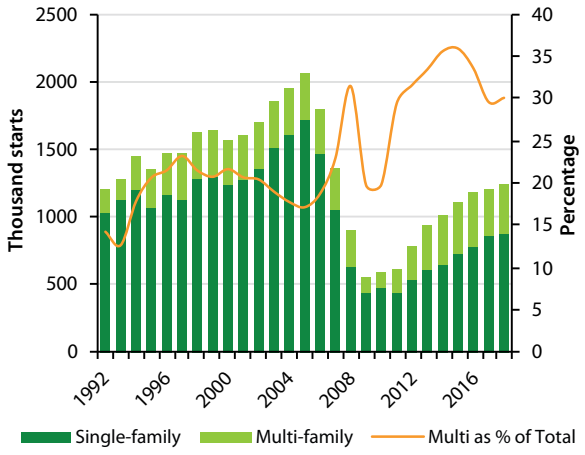
Most of the value-added products covered in this chapter are highly dependent on residential construction, repairs and renovations, and non-residential building construction.

New residential construction in Canada dropped slightly in 2017 and 2018. Unlike in the US, roughly two-thirds of Canadian starts are multifamily and this is not forecast to change. U.S. housing starts for 2018, of which 30% were multifamily – a major change compared with the decade leading up to the global financial crisis (and subsequent US recession), when as few as 13% of housing starts were multifamily (graph 9.1.1). This is significant for the forest sector because multifamily units use less wood product per start and also tend to use more prefabricated construction and engineered wood components.

The value of repairs and remodelling for "wood-product-intensive projects" in the US peaked in 2007 at more than $150 billion and is now at about $110 billion.

GRAPH 9.1.1

Share of total starts in the US held by multifamily starts, 1992-2018



Source: US Census Bureau, 2019.

9.2 Wooden furniture trade in major markets

The value of global furniture production was estimated at $470 billion in 2018, up by a staggering 7% ($20 billion) from 2017. Globally, the furniture trade has grown more quickly than furniture production in the last ten years. The migration of furniture production to lower-cost regions has not ended, despite challenges such as increased risk and difficulties in sourcing materials. An estimated 30% of global furniture production is traded internationally. The largest furniture importers are the US, Germany, the UK, France and Japan (in descending order, by value) (graph 9.2.1). The largest furniture exporters are China, Germany, Poland, Italy and Viet Nam (also in descending order, by value). The value of the world furniture trade has grown by 65% in the past ten years, from $96 billion in 2009 to $150 billion in 2018. This remarkable growth has benefited many emerging economies, led by Poland and Viet Nam (CSIL, 2019).

Strong sustained growth is forecasted for furniture consumption in 2019, especially for the main Asian consumers, with more moderate growth (3%) predicted for 2020. The Asia-Pacific region accounts for about 54% of global furniture consumption and the UNECE region for 41%. Africa, the Middle East, Latin America together are responsible for only 5% of global furniture consumption (CSIL, 2019).

Countries in the UNECE region have rapidly adopted e-commerce in the furniture segment, which has grown quickly in recent years, easily outpacing growth in the general furniture segment (regardless of the economic cycle). Traditional furniture retailers must adapt to changing consumer behaviours, with some retailers operating only online and the majority of traditional furniture retailers also offering online shopping – often with showrooms in which buyers can see furniture before purchasing it online. Germany and the UK are leading the development of online furniture sales in Europe, but the proportion of e-commerce in total retail in the UNECE region is highest in the US. Furniture sales by Amazon were estimated at $4 billion in 2017, including both proprietary and third-party products; if accurate, this would make Amazon the second-largest furniture and bedding retailer in the US. According to IBISWorld, 15 percent of the $70 billion business in US furniture sales is now transacted online, and the percentage is growing quickly (Furniture Today, 2019).

A recent survey by Furniture Today asked retailers to name critical factors with a view to identifying improvements that suppliers might make. Among the factors cited were shorter delivery times, the importance of being exclusive, recognizing popular categories, and a desire for more low-priced furniture (Furniture Today, 2019).

US wooden furniture imports were valued at $22 billion in 2018 (graph 9.2.1). China is the single-largest trading partner in the US market, accounting for almost half (47%) of all wooden furniture imports. Imports from Viet Nam, the second-largest trading partner, accounted for 20% of furniture imports. US imports from Mexico have increased at a rate of 18% per year for the past ten years, making it the fourth-largest importer after Canada (Comtrade, 2019).

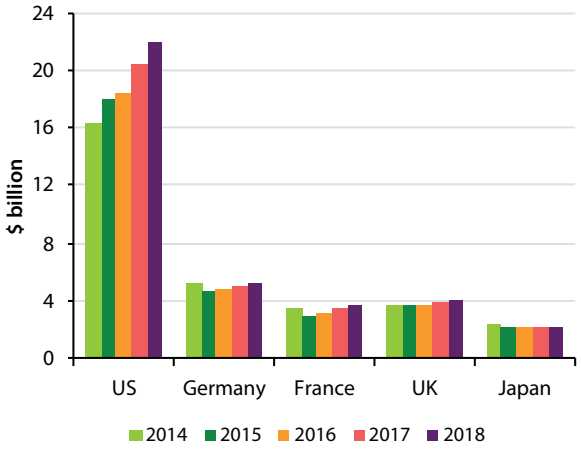
The China-US trade dispute is affecting furniture manufacturing. Several companies have recently opened new or expanded existing factories in Viet Nam to decrease reliance on China-based production in their supply chains. The dispute is fuelling optimism in Mexico, where production is smaller in scale and flexible (both for volume and customized products) and has smaller minimum delivery volumes. Faster delivery and a favourable exchange rate are additional factors that make Mexico an attractive alternative to Asian sourcing. Imports from Mexico totalled $1.3 billion in 2018 (Furniture Today, 2019).

European furniture markets were stagnant in 2018, with the main markets of France, Germany and the UK recording only moderate import growth (Furniture Today, 2019).

Although the share of wooden furniture imports from Asia to the US is high, at 74% of all imports, the market in continental Europe is much more local and the share held by Asian producers is relatively modest (table 9.2.1).

GRAPH 9.2.1

Wooden furniture imports, top five importing countries, 2014-2018



Source: Comtrade, 2019.

TABLE 9.2.1

Value of wooden furniture imports, and market share of supplying regions, top five importing countries, 2017 and 2018 (values in billion dollars, and market share in percentage)

	US		*Germany*		*France*		*UK*		*Japan*	
	2017	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*
Total value of wooden furniture imports	20.4	22.0	5.0	5.1	3.4	3.7	3.9	4.0	2.2	2.2
					Origin (%)					
Asia	78.7	78.9	17.7	17.3	25.9	26.8	54.3	52.2	92.9	92.3
Europe	8.7	8.7	81.6	82.0	72.5	71.6	38.0	39.2	6.6	7.1
North America	7.1	6.7	0.1	0.1	0.3	0.3	3.8	4.4	0.4	0.5
Latin America	5.4	5.6	0.3	0.3	0.7	0.7	2.1	2.2	0.0	0.0
Others	0.1	0.1	0.3	0.3	0.6	0.6	1.8	2.0	0.0	0.1

Sources: Comtrade, 2019.

9.3 Builders' joinery and carpentry, and profiled-wood trade

US import markets for BJC have grown for eight consecutive years (graph 9.3.1). The source of these imports is shifting away from Asian exporters, and Latin American exporters are gaining market share (USITC, 2019).

Table 9.3.1 shows that the three largest importers of BJC in Europe – France, Germany and the UK – obtained their supplies mostly from other European countries in 2017 and 2018. Similarly, Japan sourced most (about two-thirds) of its BJC from Asia.

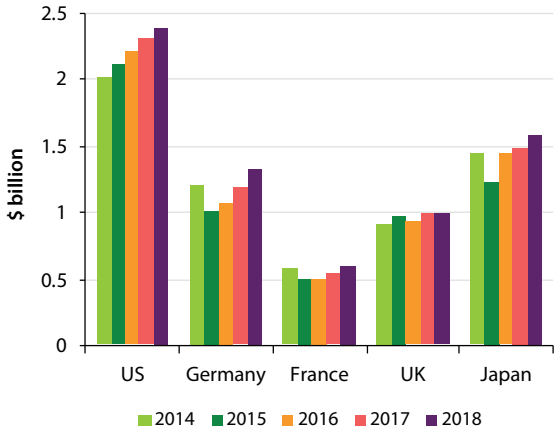
The Leading Indicator of Remodeling Activity (LIRA), compiled by the Remodeling Futures Program at Harvard University's Joint Center for Housing Studies, measures homeowner spending on improvements in the US for the current quarter and subsequent three quarters (Harvard University, 2019a). The LIRA update published in January 2019 forecast that annual growth in the US home improvement and repair market would slow considerably by the end of 2019 (from 7.0% to 2.6%) (LIRA, 2019).

Slowing house-price appreciation and slowdowns in homebuilding, sales of building materials and the issuing of remodelling permits all point to a more challenging environment for home remodelling in the US in 2019. On the other hand, more favourable mortgage rates could boost home sales and refinancing in spring and summer 2019, which could help buoy remodelling activity. Nevertheless, after several years of stronger-than-average increases, the pace of growth in remodelling activity is expected to fall back to the market's historical average annual gain of 5.2 percent (Harvard University, 2019a).

Although energy efficiency and sustainability continue to be important, a desire for healthy materials and air-quality improvements is now driving many home-improvement projects in the US. Non-toxic paints, glues and carpets are in high demand, with low-VOC (volatile organic compound) paints and formaldehyde-free forest products becoming standard in the industry. A recent study by Harvard University (2019b) found a growing appetite among consumers for a

GRAPH 9.3.1

Builders' joinery and carpentry imports, top five importing countries, 2014-2018



Source: Comtrade, 2019.

TABLE 9.3.1

Value of builders' joinery and carpentry imports, and market share of supplying regions, top five importing countries, 2017-2018 (value in billion dollars and market share in percentage)

	US		*Germany*		*France*		*UK*		*Japan*	
	2017	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*
Total value of imports	2.3	2.4	1.2	1.3	0.5	0.6	1.0	1.0	1.5	1.6
					Origin (%)					
Asia	30.7	29.9	12.3	11.6	9.7	11.1	31.8	33.2	69.5	72.0
Europe	6.5	7.6	87.1	88.0	87.2	85.0	64.0	62.7	27.7	25.8
North America	49.8	48.0	0.3	0.2	0.5	0.5	1.0	0.9	1.6	1.2
Latin America	12.6	14.2	0.0	0.0	1.0	1.8	1.7	1.5	0.0	0.0
Others	0.4	0.4	0.3	0.2	1.6	1.6	1.6	1.6	1.2	1.0

Sources: Comtrade, 2019.

TABLE 9.3.2

Profiled-wood imports, top five importing countries, 2017 and 2018
(values in billion dollars, and market share in percentage)

	US		*Germany*		*France*		*UK*		*Japan*	
	2017	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*	*2017*	*2018*
Total value of imports	1.3	1.4	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3
					Origin (%)					
Asia	26.4	31.5	20.0	20.5	7.2	7.7	40.1	42.9	75.0	74.3
Europe	4.1	4.6	74.8	73.6	64.4	60.3	54.9	52.2	10.7	11.8
North America	10.7	8.3	0.6	0.6	0.6	0.6	3.4	3.3	9.7	9.6
Latin America	58.0	55.0	3.7	4.5	26.5	30.6	1.4	1.2	4.4	4.0
Others	0.8	0.7	0.9	0.8	1.2	0.8	0.3	0.3	0.3	0.3

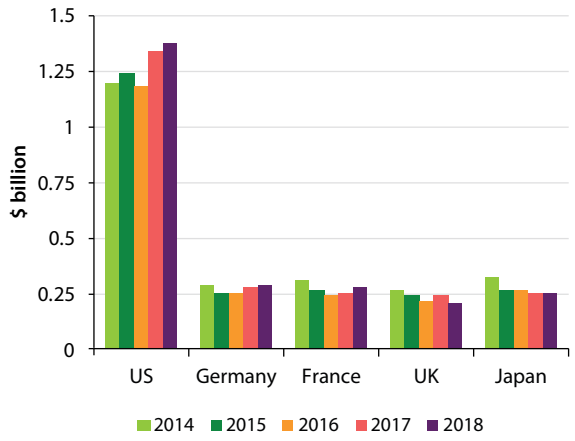
Sources: Comtrade, 2019.

healthier housing environment. In 2018, 30% of US households expressed concerns over "current home negatively affecting" a household member's or other occupant's health, up from 27 percent in 2014. Healthy home remodelling is clearly on the rise (Harvard University, 2019b).

US profiled-wood imports were valued at $1.4 billion in 2018. For the first time in history, intra-subregional (i.e. Canadian) imports amounted to less than 10% of this value.

GRAPH 9.3.2

Profiled-wood imports, top five importing countries, 2014-2018



Source: Comtrade, 2019.

High-quality South American pruned plantation pine has dominated US softwood moulding imports for decades (table 9.3.2). Several Brazilian and Chilean pine plantation owners abandoned pruning about ten years ago, however, because the market did not offer a sufficient premium, and many of the plantations were converted to eucalypt to produce pulpwood and pulp, mainly for China. At the same time, China has aggressively sought market share in the US softwood moulding market, with impressive market growth of 70% in just five years; today China is the second-largest supplier after Brazil. The total US import market has grown by $120 million in this time, but China has increased trade volume by $155 million, leaving Chile and Canada behind.

Profiled-wood markets in Europe, which are serviced mainly by other European producers, declined slightly in 2018 (graph 9.3.2 and table 9.3.2).

9.4 Engineered wood products

EWPs covered in this section are glulam timber/beams, I-beams (also called I-joists), LVL and CLT. All these products are highly dependent on new building construction, repairs and renovations.

In the US, APA – The Engineered Wood Association projects that the construction of non-residential buildings will decline to roughly $250 billion (2009 dollars) by 2022. Although concrete and steel dominate non-residential construction, an estimated one-quarter of buildings is wood-framed, and there remains considerable room for growth, especially with

the emergence of new products and systems (such as CLT) (APA, 2019a).

9.4.1 Glulam

9.4.1.1 Europe

Comprehensive data on the production and consumption of glulam in Europe are unavailable, but some information exists on trade and production at the country level.

Austria is the largest producer of glulam in Europe, at about 1.5 million m^3 per year (2015 figures), and it exports significant amounts of laminated timber products (both glulam and CLT). Italy was the single-largest importer of laminated timber products from Austria in 2018, at about 650,000 m^3 in 2018, followed by Germany (415,000 m^3) and Switzerland (140,000 m^3). Austria exported a total of 1.8 million m^3 of glulam and CLT in 2018, with Japan the only major importer outside Europe, at 122,000 m^3.

9.4.1.2 North America

Overall production of glulam in North America declined from 750,000 m^3 in 2006 to 285,000 m^3 in 2009, but it has grown steadily since then (graph 9.5.1). Production was up by 4.5% in 2018, to 468,000 m^3, but is forecast to drop slightly in 2019, to 466,000 m^3 (table 9.5.1).

9.4.2 I-beams

I-beams are more than 80% dependent on new-home construction, mostly for single-family units. Builder surveys indicate that the I-beam share of raised wood-floor area (which does not include concrete floor area) has been steady at 44-46% since 2014 (graph 9.5.2); the I-beam market share was only 16% in 1992.

Demand for I-beams peaked in 2005 at 297.3 million linear metres, which was probably the maximum capacity at that time. I-beam demand and production declined when the US housing bubble burst, with roughly 115 million linear metres produced in North America in 2009. Production has increased significantly since then, with 234 million linear metres forecast for 2019 (graph 9.5.3 and table 9.5.2).

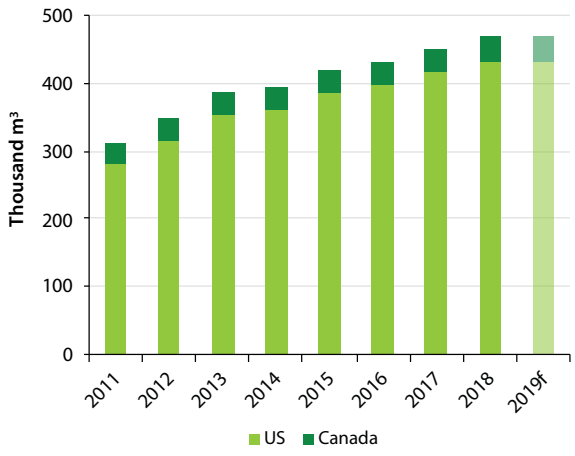
The majority (88%) of I-beams are used in new residential construction, with the balance going to non-residential building construction, repairs and remodelling (APA, 2019b).

9.4.3 Laminated veneer lumber

Most LVL is destined ultimately for new-home construction. In 2018, 73% of LVL production in North America was used in beams and headers, rim boards and like applications and the balance in I-joist flanges (table 9.5.3). Rim boards are used on the perimeters of I-beam floor systems to provide fastening points for the I-beams and to assist in distributing wall loads. North American production peaked with the US housing market in 2005, at 2.6 million m^3. According to forecasts, 2.2 million m^3 of LVL will be produced in 2019 (graph 9.5.4 and table 9.5.3).

GRAPH 9.4.1

Glulam production, North America, 2011-2019



Notes: f=forecast. Conversion factor: 650 board feet per m^3.

Source: APA, 2019b.

TABLE 9.4.1

Glulam production and consumption, North America, 2017-2019 (thousand m^3)

	2016	*2017*	*2018f*	*Change (%) 2016-2017*
US				
Production	416.9	432.3	432.3	3.7
Total consumption	421.5	436.9	438.5	3.6
Residential	246.2	258.5	258.5	5.0
Non-residential	153.8	156.9	158.5	2.0
Industrial, other	21.5	21.5	21.5	0.0
Inventory change	-4.6	-4.6	-6.2	0.0
CANADA				
Production	30.8	35.4	33.8	15.0
NORTH AMERICA				
Total production	447.7	467.7	466.2	4.5

Notes: f = forecast. Conversion factor: 1 m^3 = 650 board feet. Canadian imports are assumed to be minimal.

Source: APA, 2019b

GRAPH 9.4.2

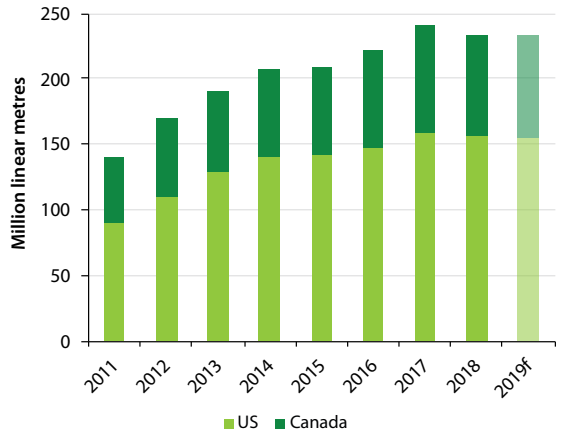
I-beam market share of total raised-wood floor area, single-family homes, US, 2011-2019

Note: f = forecast.

Source: APA, 2019b.

GRAPH 9.4.3

I-beam production, North America, 2011-2019



Note: f = forecast. Conversion factor: 1 linear metre = 3.28 linear feet.

Source: APA, 2019b.

LVL is well accepted for use in beams and headers, and consumption should grow as the housing market improves. Like other EWPs, LVL allows the use of longer spans and fewer pieces to carry the same loads as other conventional wood products.

In addition to the EWPs discussed in this chapter, a number of other structural composite lumber products are manufactured in North America, such as parallel strand lumber (PSL), laminated strand lumber (LSL) and oriented strand lumber (OSL). Production volumes of these products are relatively low compared with other EWPs (APA, 2019b).

TABLE 9.4.2

Wooden I-beam consumption and production, North America, 2017-2019 (million linear metres)

	2017	*2018*	*2019f*	*Change (%) 2017-2018*
US				
Production	157.9	156.7	155.5	-0.8
Total consumption	198.2	196.6	193.9	-0.8
New residential	173.5	172.0	168.6	-0.9
Repair, remodelling	11.9	11.9	12.5	0.0
Non-residential, other	12.8	12.8	12.8	0.0
CANADA				
Production	82.3	76.8	78.0	-6.7
Consumption	35.1	33.5	35.7	-4.3
Inventory change	2.7	-0.3	0.0	-111.1
NORTH AMERICA				
Total production	240.2	233.5	233.5	-2.8

Notes: f = forecasts. Conversion: 1 linear metre = 3.28 linear feet.

Source: APA, 2019b.

TABLE 9.4.3

Laminated veneer lumber consumption and production, North America, 2017-2019 (thousand m^3)

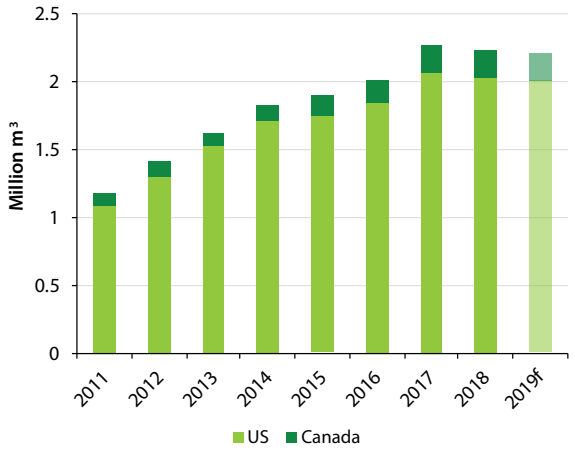
	2017	*2018*	*2019f*	*Change (%) 2017-2018*
CONSUMPTION				
I-beam flanges	603	592	595	-1.9
Beams, headers, others	1,668	1,625	1,614	-2.5
Total consumption	**2,271**	**2,217**	**2,209**	**-2.4**
PRODUCTION				
US	2,059	2,019	2,011	-1.9
Canada	212	198	198	-6.7
Total production	**2,271**	**2,217**	**2,209**	**-2.4**

Notes: f = forecast. Conversion: 1 m^3 = 35.3137 cubic feet.

Source: APA, 2019b.

GRAPH 9.4.4

Laminated veneer lumber production, North America, 2011-2019



Note: f = forecast. Conversion factor: 1 linear metre = 3.28 linear feet.

Source: APA, 2019b.

9.4.4 Cross-laminated timber

The production of CLT (often categorized as a mass timber product) continues to grow, both inside the UNECE region and in countries outside the region with a tradition of wood construction, such as Australia and Japan. Proponents of the wood industry see great potential for this product in enabling the use of wood in the construction of large and tall structures that previously were the sole domain of steel and concrete (Timber-online, 2017).

A study by Zion Market Research (2018) found that the global CLT market was valued at $603 million in 2017 and projected it to reach $1,606 million in 2024.

Architects and builders are embracing CLT because it has many advantages in terms of construction costs, time of construction, and thermal and embodied efficiency. CLT also has a relatively small environmental and carbon footprint, not only in construction but over the life of the buildings in which it is used. Moreover, it is getting harder in the UNECE region to find construction workers and carpenters with the ability to fabricate onsite, and pre-fabricated construction is increasing. CLT lends itself to prefab construction.

The cost of constructing buildings in North America appears to be similar for CLT and concrete, although a cost comparison in the US found CLT to be slightly (0.6-1.4%) cheaper (Oregon Best, 2017). Anecdotal information from European users of CLT for construction provided at the 74th Session of the ECE Committee on Forests and the Forest Industry in 2016 (in Geneva, Switzerland) suggests that the cost of CLT buildings is also comparable to concrete and steel in Europe (Eastin, 2016).

It is worth noting that CLT is not immune to criticism, even in areas that have enthusiastically advocated its use, such as the US state of Oregon. A high-profile failure of CLT panels occurred in March 2017 in the construction of a much-publicized structure at Oregon State University. One panel delaminated and failed and others were found to be at risk of failure. The problem was traced to a faulty gluing process by the manufacturer and will be costly to address (Oregon State University, 2018). Moreover, firefighter unions in Oregon and elsewhere have been critical of tall buildings made of CLT (Manning, 2018). Below, we summarize CLT developments in the UNECE region.

9.4.4.1 Europe

Europe's share of the global CLT market was about 60% in 2017, with an established manufacturing base centred in the DACH[13] countries (Zion Market Research, 2018). There are also CLT production plants elsewhere in Europe, with more in the pipeline (table 9.5.4).

9.4.4.2 The CIS subregion

The Segezha group has initiated construction of the first CLT plant in the Russian Federation. The group is investing almost $48 million in the plant, which will have a capacity of 250,000 m^2 of CLT panels per year. The plant will be in Sokol, Vologda region, and should be completed by the fall of 2020 (Lesprom, 2019).

9.4.4.3 North America

The CLT industry in North America is growing quickly. Previously it was focused on the use of CLT as platforms in the mining and oil industries, but CLT is increasingly being deployed in the construction of residential and non-

13 The DACH includes Germany, Austria and Switzerland.

TABLE 9.4.4

Cross-laminated timber production, Europe, 2016-2020 (1,000 m^3/year)

Company	*Country*	*2016*	*2017*	*2018**	*2020**
Binderholz	Austria; Germany; Sweden	145	170	195	270
Stora Enso	Austria	130	150	170	260
KLH Massivholz	Austria	88	110	120	210
Hasslacher Norica Timber	Austria; Germany	40	38	55	120
Legal & General	UK	…	…	…	120
Pfeifer Holz	Germany	…	…	…	100
Mayr-Melnhof Holz	Austria	60	70	75	80
Piveteaubois	France	…	…	…	80
Splitkon	Norway	…	…	…	60
CLT Plant	Finland	…	…	…	50
Schilliger Holz	Switzerland	13	…	…	50
CLT Finland	Finland	5	…	…	40
Eugen Decker	Germany	25	25	25	30
Züblin Timber	Germany	30	30	30	30
Cross Timber Systems	Latvia	25	…	…	25
XLam Dolomiti	Italy	20	13.5	15.5	23
Martinsons	Sweden	…	…	22	20
Weinberger Holz	Austria	5.5	6.5	6.5	20
W.u.J. Derix	Germany	12.5	12.5	12.5	15
Setra	Sweden	…	…	…	55
Agrop Nova	Czechia	…	7	7	…
Kurt Huber	Germany	…	5	5	…
lignotrend	Germany	…	24	26	…
Merkle Holz	Germany	…	1	1	…
Johann Pabst Holzindustrie	Austria	…	…	…	…
Rubner Holzbau	Italy	…	3.8	7	…
Schilliger Holz	Switzerland	…	13	13	…
Pius Schuler	Switzerland	…	…	…	…
Holzbau Unterrainer	Austria	…	7	10	…

Note: Production figures are a mix of estimates and reported data.

Data not available = …

Source: Timber-online, 2018.

residential buildings, particularly large urban buildings on the west coast (Beck Group, 2018).

As of late 2018, ten CLT manufacturing plants were in operation in North America (five in Canada and five in the US), with a combined annual production of about 400,000 m^3; two plants were under construction (both in Washington state), with a forecasted production of about 185,000 m^3; and three more plants had been announced (Beck Group, 2018).

9.4.4.4 Extraregional

Japan has embraced a road map for the development of its CLT industry. Among the goals of Japan's roadmap are obtaining a 6% share for CLT in buildings up to four stories high; the use of subsidies to offset up to 50% of the investment costs of new CLT plants; an increase in domestic CLT production capacity to 500,000 m^3 by 2024 (Timber-online, 2017); and a reduction in CLT production costs of more than 50% through mechanization and efficiency gains (Eastin, 2016). CLT production in Japan was just over 68,000 m^3 in 2017, with projections of more than 380,000 m^3 by 2023 (Globe Newswire, 2018).

CLT has also found fertile ground in Oceania. New Zealand has been producing CLT commercially since 2013 (Muszynski *et al.*, 2017), and Australia's first CLT plant started production in mid-2018.

9.5 Policy issues affecting markets for value-added wood products

Many building codes in the UNECE region are prescription-based (i.e. they are specific to certain building materials). This means that the use of wood for constructing certain types of building that traditionally have been made with other materials requires testing and the rewriting of codes. This often requires time-consuming case-by-case review.

As part of the trade dispute between China and the US, the US has announced the imposition of additional tariffs of 25% on a list of products. The tariffs will be imposed in three tranches, with the first and second tranche amounting to approximately $50 billion and the third tranche to about $200 billion. China has counter-issued tariffs on products imported from the US valued at about $60 billion aimed at agricultural and wood products. Consequently, US wood exports to China have dropped to approximately $1 billion (Mellnik, Shapiro and Rabinowitz, 2019).

The UK's exit from the EU has the potential to change trade flows for value-added wood products, and mainland EU producers (and UK buyers) are uneasy about the future. Brexit could also mean the imposition of trade tariffs on wood products, the re-establishment of physical borders and the

breakdown of the common customs union, which could affect the cost of transportation for wood products.

The EU amended its "waste directive" (EU, 2018) in May 2018 to provide a legal framework aimed at improving the use, re-use, reclaiming and recycling of materials as part of an effective transition to a circular economy. The impact on wood product markets of this policy is unclear, but some companies are already accommodating the possible re-use and recycling of their products in developing new furniture, and they are considering strategies aimed at maximizing raw materials reclaimed from the post-consumer wood stream.

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Chapter **10**

HOUSING AND CONSTRUCTION

Lead author: Delton Alderman

Highlights

Real house prices rose by 2.2% in the euro area in 2018.

The median price for new single-family units in the US was $326,200 in 2018, an increase of nearly 1% from 2017 ($323,100).

The European housing markets continued their positive trend in 2018, recording a fifth consecutive year of growth. New residential spending increased by 26% between 2015 and 2018, a €72.3 billion improvement.

On average, 80 million m^2 of new housing has been commissioned annually in recent years in the Russian Federation, but analysts suggest that 120 million m^2 is needed per year to meet demand and replace ageing housing stock.

Most construction sectors of the US housing market flatlined in 2018. Beginner or starter housing remains weak, and the quantity of dwellings being built is insufficient to accommodate population growth.

The number of US household formations increased in 2018 but remains less than the historical average.

The Canadian housing market is projected to be stable to 2021.

In Canada, nationwide mortgage guidelines, have helped stem price acceleration.

The US and Euroconstruct region's new-construction markets appear to have normalized at a lower level than their respective historical averages.

With growing urban and suburban populations and the underbuilding of new housing in Europe and North America, factory-built housing may be the segue needed to move towards affordable housing.

10.1 Introduction

Housing prices have generally performed better than economies in most countries in the UNECE region. Economic projections and house-price analysis can 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 housing prices increased by 1.9% globally in 2018, year-on-year, and by 2.2% in the euro area, 2.0% in the US and 1.0% in the Russian Federation. Canadian house prices retreated, however, by 0.06%. According to BIS, real residential prices (adjusted for inflation) are still substantially higher than in the wake of the global financial crisis (BIS, 2019).

10.2 European construction market

10.2.1 Review and outlook

Housing markets continued their growth in 2018, recording a fifth consecutive year of growth (ECB, 2019). New residential building remains a value driver in the Euroconstruct region, accounting for nearly 25% (€342 billion) of the construction market value, and residential remodelling comprised 26% (€422 billion) of the volume. Combined, new residential and residential remodelling comprised 48% of construction value in 2018. New residential spending has increased by 26% (€72.3 billion) since 2015 (Euroconstruct, 2019).

Although housing construction estimates and forecasts are somewhat tempered, investors appear to have increased interest in the residential sector. A recent survey by PwC (2019) found that 60% of respondents (compared with 28% in 2015) are investing in residential real estate (e.g. student and social housing, co-living, multifamily dwellings, retirement/assisted living, and private rented residential) in some form, and 66% desire to increase their holdings.

France and Germany are the two largest housing markets in the euro area. In France, 2017 and 2018 were record years for housing sales but, even so, new housing is insufficient to meet demand, in areas under strain (quickly developing cities such as Paris and regional metropolises). Building permits are declining, construction costs are up, and legal challenges to permits issued are impediments to new construction (Barros, 2019).

Möbert (2019) estimated that a housing shortage of more than 1 million units has arisen in Germany since 2009 and that 350,000 to 370,000 new apartments per year would have to be built between 2018 and 2020 to alleviate this. Thus, the German housing deficit is unlikely to contract in the near term.

Building permit forecasts for 2019 to 2021 in the Euroconstruct[14] region indicate reduced permit applications, however short run forecasts suggest a slight increase. Total housing completions increased in 2018, year-on-year, but new residential completions per inhabitant were divergent across countries. For example, average housing completions per 1,000 inhabitants was 0.7 in Portugal and 6.5 in Switzerland. The Euroconstruct area average was 3.2 completions per 1,000 persons (Euroconstruct, 2019).

Affordable housing is an often expressed refrain in Europe and North America. Not only have increasing house prices deterred many potential buyers from house purchases, builders have experienced lacklustre profit margins due to increasing material and labour costs, regulations, and a lack of land availability. The population in the Euroconstruct area is growing by an average of 1.46 million people per year and is forecast to increase, in aggregate, by 0.9% over the next three years (decreases are projected in only three of the 19 Euroconstruct countries); the number of households is forecast to grow by 1.5% (Euroconstruct, 2019). According to PwC (2019), "Every major city in Europe has the same issue: lack of affordable housing."With growing urban and suburban populations and the underbuilding of new housing in Europe and North America, factory-built housing may be the segue needed to move towards affordable housing.

14 The Euroconstruct region comprises 19 countries. The western subregion consists of Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK. The eastern subregion comprises the Czech Republic, Hungary, Poland and Slovakia.

10.2.2 Total, civil-engineering and non-residential construction spending

The total turnover of the Euroconstruct region's construction industry was estimated at €1,610 billion in 2018, up by 3.1% from 2017. Non-residential construction constituted 33.2% and civil engineering 23.7% of the 2018 total. Annual aggregate construction growth is forecast to remain below 1.9% in the Euroconstruct region until 2021 (table 10.2.1) (Euroconstruct, 2019).

Grandovska (2019) reported that construction spending increased by 6.3% and in the euro area and by 5.8% in the EU28 between March 2018 and March 2019. Euroconstruct (2019) projected total civil-engineering spending to increase by 4.2% in 2019, 3.1% in 2020 and 2.9% in 2021 and total non-residential expenditure to grow by 1.3% in 2019 and by 1.2% in both 2020 and 2021.

10.2.3 Residential construction and remodelling

New housing construction remains tepid in the Euroconstruct region, although spending volume increased by 5.3% in 2018, year-on-year. New residential and remodelling construction spending accounted for 47% of total construction spending (residential remodelling accounting for 26% and new residential for 21%). New residential construction is projected to increase slightly to €347.9 billion in 2019 and €351.2 billion in 2021. Forecasts for new residential and remodelling construction growth are subdued in the Euroconstruct region (table 10.2.1) (Euroconstruct, 2019).

Residential remodelling is forecast to be a driver in construction spending, increasing from €425.2 billion in 2019 to €434.5 billion in 2021 (table 10.2.1). Remodelling continues to present opportunities, in western and northern Europe, due to ageing housing stock. As in the US, many euro-area homeowners are opting to age in place rather than relocate. Historically, government programmes have supported house remodelling (Euroconstruct, 2019). In several countries, remodelling is a priority investment in the framework of climate change mitigation strategies, seeking at improving the number of buildings with good thermal insulation, thus reducing energy consumption.

An estimated 1.786 million new-housing permits were issued in the Euroconstruct region in 2018. The number of permits issued is a leading economic indicator because it is forward-looking, and it is therefore used in several countries to gauge future economic activity and housing supply. In 2018, permits were issued in the Euroconstruct region for 1.118 million flats and 668 thousand 1+2 family units. Table 10.2.2 shows estimates and projections for issued building permits for the top five countries in 2018; graph 10.2.1 displays total permits, starts and completions in the Euroconstruct region in the period 2002-2021.

New housing starts in the Euroconstruct area were estimated at 1.434 million units in 2018, comprising 827 thousand flats and 607 thousand 1+2 family dwellings. Start data can be used for assessing housing demand and for forecasting future construction employment, consumer-based product

TABLE 10.2.1

Construction spending forecast, Euroconstruct region, 2019-2021 (€ billion)

				Change (%)		
	2019e	*2020f*	*2021f*	*2018-2019*	*2019-2020*	*2020-2021*
New residential construction	347.9	350.0	351.2	1.7	0.6	0.3
Residential remodelling	425.2	430.6	434.5	0.8	1.3	1.1
Non-residential – new	275.2	278.2	281.5	1.3	1.1	1.2
Non-residential – remodelling	245.3	248.7	251.7	1.4	1.4	1.2
Civil engineering – new	204.6	212.6	220.2	5.5	3.9	3.6
Civil engineering – remodelling	142.3	144.7	147.6	2.3	2.0	2.0
TOTAL	**1,640**	**1,665**	**1,688**	**1.9**	**1.5**	**1.4**

Notes: in 2018 prices; e = estimate; f = forecast.

Source: Euroconstruct, 2019.

TABLE 10.2.2

Top five Euroconstruct region countries for total housing permits, 2018-2021

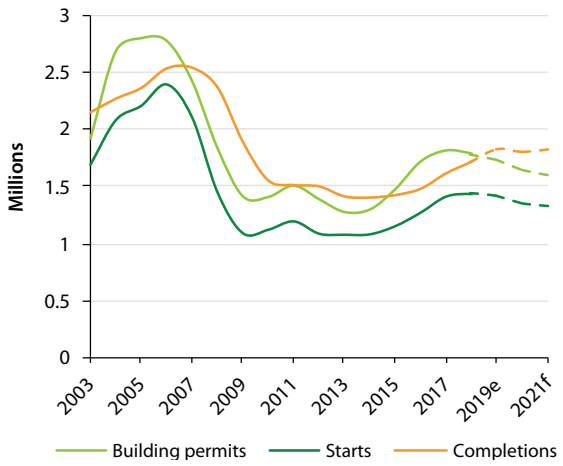
	2018e	*2019f*	*2020f*	*2021f*
	(THOUSAND HOUSING PERMITS)			
France	455.7	427.4	367.6	330.9
Germany	347.3	335.0	320.0	305.0
Poland	251.1	225.0	215.0	220.0
Italy	89.9	91.9	92.5	92.8
Spain	80.0	95.0	98.0	90.0

Notes: e = estimate; f = forecast. UK data are unavailable.

Source: Euroconstruct, 2019.

GRAPH 10.2.1

Building permits, starts and completions, Euroconstruct region, 2003-2021



Notes: * =estimate; **= forecast.

Sources: Euroconstruct, 2004, 2019.

TABLE 10.2.3

Top five Euroconstruct region countries for housing starts, 2018-2021

	2018e	*2019f*	*2020f*	*2021f*
	(THOUSAND HOUSING STARTS)			
France	419.0	389.6	359.1	319.5
Poland	221.9	230.0	210.0	220.0
UK	189.6	193.0	198.0	207.0
Spain	100.7	118.0	120.0	110.0
Sweden	58.4	46.1	41.4	45.9

Notes: e = estimate; f = forecast. Germany data are unavailable.

Source: Euroconstruct, 2019.

demand, and potential recessions. Table 10.2.3 presents forecasts for the top five countries for housing starts in the Euroconstruct region in 2018.

Total completions were estimated at 1.72 million units in 2018, comprising 996 thousand flats and 724 thousand 1+2 family units. Completion data indicate the quantity of houses finished and available for sale or rent; as with starts, they can be used in estimating sales for consumer-based products. Table 10.2.4 shows estimates and projections for housing completions in the top five Euroconstruct countries in 2018-2021 (Euroconstruct, 2019).

TABLE 10.2.4

Top five Euroconstruct region countries for total housing completions, 2017-2020

	2018e	*2019f*	*2020f*	*2021f*
	(THOUSAND HOUSING COMPLETIONS)			
France	396.0	430.0	399.0	376.0
Germany	300.0	310.0	315.0	320.0
UK	189.1	190.0	195.0	203.0
Poland	180.9	200.0	210.0	222.0
Italy	83.5	87.0	89.7	91.7

Notes: e = estimate; f = forecast.

Source: Euroconstruct, 2019.

TABLE 10.2.5

Top five Euroconstruct region countries for new construction and remodelling expenditures, 2018-2021 (€ billion)

	2018e	*2019f*	*2020f*	*2021f*
	NEW CONSTRUCTION			
Germany	68.2	70.6	70.2	69.2
UK	56.0	57.0	58.7	62.0
France	47.2	45.2	43.7	39.3
Spain	36.1	39.5	41.9	42.1
Switzerland	21.0	20.2	19.9	19.9
	REMODELLING			
Germany	131.2	130.6	129.9	129.3
Italy	68.7	69.2	69.8	70.7
France	62.3	63.0	64.8	65.3
UK	39.7	40.0	41.1	41.9
Netherlands	20.7	21.0	21.6	22.1

Notes: in 2018 prices; e = estimate; f = forecast.

Source: Euroconstruct, 2019.

Table 10.2.5 presents estimates and projections for new construction and remodelling valuations for the top five countries in 2018-2021. Germany is top-ranked in expenditure for both new construction and remodelling (Euroconstruct, 2019).

10.2.4 Top five new-housing-permit countries in focus

Below are insights into the top five permit-issuing countries in the Euroconstruct region in 2018.

France. INSEE (2019) data indicate the average size of one-family dwellings at 87.2 m^2. The European Commission's European Construction Sector Observatory (ECSO, 2018a) forecasted French construction spending to increase by 2.5% in 2018.

Germany. Germany's housing market remains robust (Delmendo, 2018), with housing prices increasing by 3.2% in 2018 (FRED, 2019a). Spending in Germany's construction sector was projected to increase by 4% in 2018 (ECSO, 2018b).

Poland. The Polish housing market is robust due to a strong economy, rising employment and wages, and historically low interest rates. The "Apartments for the Young" plan spurred demand but is being phased out in 2019. In 2018, dwelling permits were reported at 251,030 units, a 3.3% increase, year-on-year; starts rose by 7.7%, to 221,907 units, and completions grew by 3.8%, to 185,170 units (Delmendo, 2019a). There was an estimated 14.4 million households in Poland in 2017, an increase of 9.0% over 2010. In 2018, 83.7% of dwellings were owner-occupied. Spending in Poland's housing construction subsector was €12.6 billion in 2017 (47.6% of total construction spending). The housing outlook for Poland is positive, with continued low interest rates, rising incomes and subsidy programmes expected to increase housing demand (ECSO, 2019a).

Italy. Although the Italian economy is weak, the country's housing market is recovering (Delmendo, 2019b); nevertheless, dwelling building permits declined by 52.2% between 2010 and 2016 (Istat, 2019). The value-added share of gross GDP held by real estate activities was 12.6% in 2017, with an estimated value of €18.2 billion. There has been a continued increase in households since 2010, reaching 25.9 million in 2017. A number of factors are hindering new-housing demand, including an ageing population; high unemployment among potential first-time house buyers (i.e. young people); and the apparent risk-aversion of households, many of which are exhibiting cautious saving and investment behaviours. New residential construction is the lone subsector forecast to decrease in Italy to 2021 (ECSO, 2019b).

Spain. Delmendo (2019c) reported that Spanish house prices increased by 6.5%, year-on-year, in 2018. Housing demand is rising, with sales forecast to increase from 500,000 units in 2018 to 625,000-650,000 in 2019. According to INE (2019a), Spain had 25.7 million residences in 2018, of which 19.2 million (75%) were primary residences. In total, housing stock increased by 67,644 units in 2018. As in several other countries, Spain overbuilt new housing before the global financial crisis. INE (2019b) recorded that 17,062 new uninhabited houses were absorbed in 2018, reducing the available new housing stock to 459,876 units. ECSO (2018c) reported that real estate activities contributed 12.3% (€14.1 billion) to the Spanish GDP in 2016.

10.2.5 Non-residential buildings and civil engineering

Non-residential construction accounted for 32% of aggregate construction value in the Euroconstruct region in 2018. Overall economic conditions and government spending (e.g. on buildings for education and health) influence demand. New non-residential construction is predicted to increase by 1.3% in 2019, 1.1% in 2020 and 1.2% in 2021 (table 10.2.1). Germany, the UK, France, Italy and Spain (in descending order, by value) were the five largest non-residential construction markets in 2018 (Euroconstruct, 2019).

The new non-residential building valuations for 2018 were as follows: commercial buildings – €54.0 million (19.9% of the total); office buildings – €47.5 million (17.5%); industrial buildings – €43.4 million (16.0%); miscellaneous construction – €36.6 million (13.5%); educational buildings – €30.2 million (11.1%); storage buildings – €23.3 million (8.6%); health buildings – €20.4 million (7.5%); and agricultural buildings – €16.3 million (6.0%) (Euroconstruct, 2019).

Civil-engineering projects are affected by different factors in different countries, and modest spending increases are forecast through 2021 (table 10.2.6; graph 10.2.2). Germany, France, Italy, the UK and the Netherlands (in descending order, by value) were the five largest civil-engineering markets in 2018 (Euroconstruct, 2019).

TABLE 10.2.6

Civil-engineering construction spending estimate and forecasts, Euroconstruct region, 2018-2021
(€ billion)

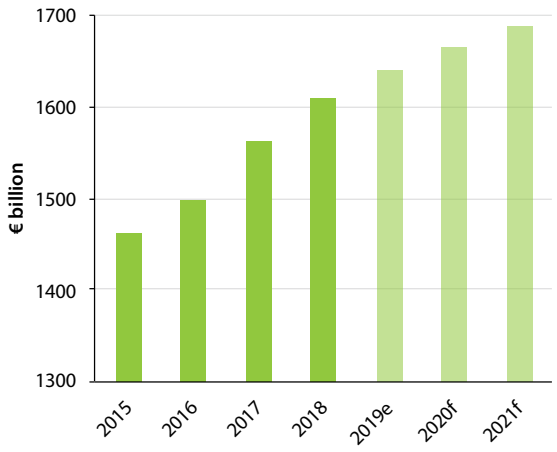
	New civil-engineering construction	*Civil-engineering renovation*	*Total civil engineering*
2018	193.9	138.7	332.6
2019e	204.6	142.3	346.5
2020f	212.6	144.7	357.4
2021f	220.2	147.6	367.8

Notes: in 2018 prices; e = estimate; f = forecast.

Source: Euroconstruct, 2019.

GRAPH 10.2.2

Euroconstruct region construction spending, 2015-2021



Notes: in 2018 prices; e = estimate; f = forecast.

Source: Euroconstruct, 2019.

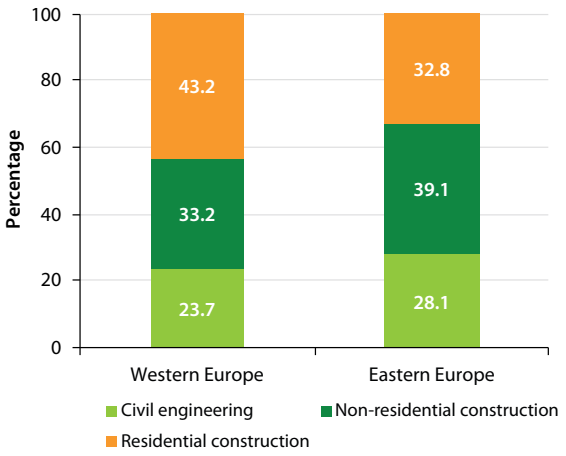
10.2.6 Construction-sector shares and growth: contrasting western and eastern Europe

Total residential construction expenditure in the Euroconstruct's western subregion[14] is projected to increase from €743.9 billion in 2019 to €755.6 billion in 2021. Total residential construction spending in the eastern subregion is forecast to increase from €29.2 billion to €31.1 billion over the same period (Euroconstruct, 2019).

New residential expenditure led the construction sector in the Euroconstruct western subregion (43.2% of total construction spending), followed by new non-residential (33.2%) and new civil engineering (23.7%). Expenditure in the eastern subregion was led by new non-residential (39.1%), followed by new residential (32.8%) and new civil engineering (28.1%) (graph 10.2.3) (Euroconstruct, 2019).

GRAPH 10.2.3

Share of new construction, by Euroconstruct subregion and sector, 2018



Source: Euroconstruct, 2019.

10.3 Russian Federation and Commonwealth of Independent States construction markets

10.3.1 Housing construction in the Russian Federation

Completions of residential buildings in the Russian Federation in 2018 declined by 4.6% over the previous year. The estimate for total buildings (residential plus non-residential) put in place was down by 4.8% over 2017. The total floor area of new housing put in place in the Russian Federation is expected to increase substantially in 2019 over the average since 1996 (+30%). (Trading Economics, 2019a).

Flats and apartments commissioned in the Russian Federation are forecast to see a 1.0% increase in 2018 (Iambla *et al.*, 2018). The rate of homeownership averaged 80.3% from 2000 to 2016 and is forecast to reach 84% in 2020 (Trading Economics, 2019b). Analysis of Russian Federation housing price data indicates that aggregate prices increased by 4.9% between the fourth quarter of 2017 and the fourth quarter of 2018 (FRED, 2019b).

Iambla *et al.* (2018) reported that new-house commissions were driven by multidwelling units and that a lack of real wage growth may not stimulate residential housing completions in the near future. Fedyakov (2018) stated that 120 million m^2 of new housing is needed because of the ageing housing stock; on average, 80 million m^2 has been commissioned annually for the past few years.

The Russian Federation's Ministry of Economic Development's long-term plan, introduced in 2015, is for public agencies to construct wooden houses to stimulate the Russian wood products industry and provide public housing. The latter comprised 20% of all housing in 2016, 25% in 2017 and 30% in 2018 (Kochkurova, 2016). The Russian construction market was valued at €133,673 million in 2017, and it was forecast to grow by 0.5% in 2018, decline by 0.8% in 2019 and increase again by 1.1% in 2020 (Gáspár, 2019).

10.3.2 Construction in the Commonwealth of Independent States

10.3.2.1 Armenia

Armenia reported an estimated 441,591 multiple dwellings in place in 2016. The average size of housing per inhabitant was 31.9 m^2 in 2017, a slight increase over 2016 (31.4 m^2). The total area of dwelling stock was 94.8 m^2 in 2017, an increase of 1.1% from 2016 (93.8 m^2) (1,000 m^2 basis). There were 396,948 houses in 2017, up by 3,338 units from 2016. In 2018, 268,041 m^2 of dwelling space was put in place (Statistical Committee of the Republic of Armenia, 2018).

10.3.2.2 Azerbaijan

An estimated 154,000 dwellings were put in place in Azerbaijan in 2017, an increase of 5.4% over 2016, and 2,017 m^2 floor space was added (1,000 m^2 basis), down by 4.9% compared with 2016. The average living area was 130.8 m^2 in 2017, a decrease of 9.7% (from 144.9 m^2) in 2016. In 2017, 1.6 dwellings per 1,000 persons were put in place, up from 1.5 in 2016 (State Statistical Committee of the Republic of Azerbaijan, 2019).

10.3.2.3 Belarus

Belarus reported 258.6 million m^2 of housing stock in place in 2018, an increase of 0.8% from 2017. This equated to 27.3 m^2 per inhabitant, an increase of about 1.1% (from 27.0 m^2) in 2017. There were 25,420 apartment units in Belarus in 2018, up by 8.6% from 2017 (when there were 23,398 units). (National Statistical Committee of the Republic of Belarus, 2019).

10.3.2.4 Kazakhstan

In Kazakhstan, 12.5 million m^2 of residential building floor space was started in 2018, an increase of 12.1% from 2017 (11.17 million m^2). The area of residential floor space per person was 21.3 m^2 in 2016, up by 1.4% from 2015 (when it was 21.0 m^2) (Ministry of the National Economy of the Republic of Kazakhstan Committee on Statistics, 2019).

10.3.2.5 Kyrgyzstan

An estimated 1.30 million flats and housing units were in place in Kyrgyzstan in 2018, up by 0.8% in 2017 (when there were 1.29 million units). The total floor area put in place decreased by 33.3% in 2018, when 1.0 million m^2 was commissioned (compared with 1.5 million m^2 in 2017). The average size per person was 13.1 m^2 in 2018, down from 13.2 m^2 in 2017 (National Statistical Committee of the Kyrgyz Republic, 2018).

10.3.2.6 Moldova

Moldova reported that an estimated 700,400 m^2 of dwelling space was put in place in 2017, up by 35.8% from 2016 (when 515,500 m^2 was put in place). The number of dwellings built was 92,000 in 2017, an increase of 50.8% from 61,000 in 2016. Average floor space put in place decreased by 10.8% in 2017, to 75.7 m^2, down from 84.9 m^2 in 2016. There were 1.29 million dwelling units in January 2018, with a total area of 87.27 million m^2. An estimated 1,212 dwellings (apartments and individual residences) with a total area of 104.4 m^2 were put in place in January to March 2019 (National Bureau of Statistics of the Republic of Moldova, 2019).

10.3.2.7 Tajikistan

The total floor area in Tajikistan was 96.3 million m^2 in 2017, up by 3.2% from 2016 (when it was 93.3 million m^2). There were 283,500 privatized apartments in 2017, up by about 1.3% from 2016 (TAJSTAT, 2018).

10.3.2.8 Ukraine

Ukraine's construction market was valued at €7.1 billion in 2017, and the forecast was for a rise of 4.4% in 2018, 2.8% in 2019 and 3.1% in 2020 (Gáspár, 2019). An estimated 103,141 residential units were put into service in 2018, with an average size of 84.2 m^2. The total area of residential buildings in 2018 was 8.69 million m^2, a decline of 5.7% from 2017 (when it was 9.22 million m^2). An estimated 26,554 single-

family units were put in place in 2018, with an average floor area of 160.0 m^2; there were also 76,587 new apartment units with a mean area of 57.9 m^2 (SSSU, 2019a). In 2017, 39,970 residential buildings were started, an increase of 1.5% from 2016 (when there were 39,360 starts). The average size of starts also increased, from 10,014 m^2 in 2016 to 11,368 m^2 in 2017 (SSSU, 2019b). According to KHL (2019), housing units are oversupplied, with supply exceeding demand by 18-20 units. This overbuilding is a result of addressing Ukraine's past housing deficit with new housing stock. Looking forward, the residential construction sector is projected to decline. KHL (2018) reported better growth prospects for civil-engineering construction due to budget increases for transportation and energy infrastructure.

10.3.2.9 Uzbekistan

In 2018, 79,200 houses were put in place, an increase of 0.6% over 2017, when 78,700 houses were completed. The total floor space put in place increased by 5.4% in 2018, to 1.21 million m^2 (State Committee of the Republic of Uzbekistan on Statistics, 2018).

10.4 North American housing markets

The US housing market has improved since 2009 and the Canadian market has been steady (graph 10.4.1).

Although, overall, the US housing market has grown, new single-family house construction and sales are still far below their historical averages. In Canada, the primary concerns are housing overvaluation (with prices at historic highs, even after adjusting for inflation), consumer debt and mortgage regulations.

10.4.1 US housing market

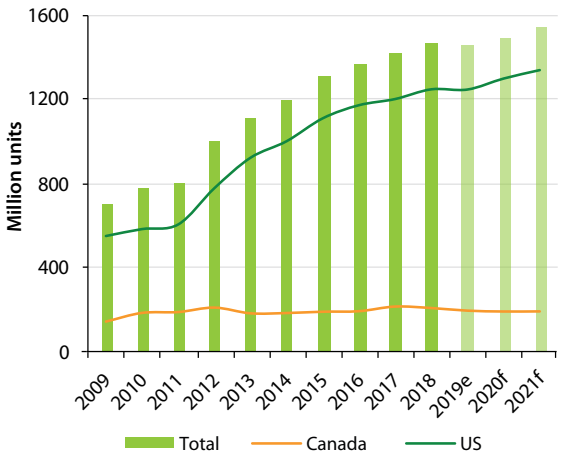
The US housing construction market continued to grow moderately in 2018, but total new housing starts remained below the 1959-to-2007 average of 1.547 million total units and 1.102 million single-family units. Housing starts were estimated at 1.250 million in 2018, a 3.9% increase from 2017 (graph 10.4.2) (US Census Bureau, 2019a).

US sales of newly constructed single-family houses were 617,000 units (seasonally adjusted annualized rate – SAAR) in 2018 (US Census Bureau, 2019b). This was much less than the 1963-to-2007 average (697,000 units) and similar to the average in 1963-1970, a period in which the civilian non-institutional population averaged 176.5 million, compared with 257.8 million in 2018 (FRED, 2019b). The number of single-family units being built is insufficient to meet the need created by population growth, and there is a shortage of "starter houses" (typically 1,400 square feet – 133.8 m^2 – or less). New single-family sales and starts are crucial for the wood products industry, with these units consuming more value-added products than any other wood-utilizing sector.

The median price for new single-family units in the US was $326,200 in 2018, up by nearly 1% from 2017 (when the median price was $323,100). The mean price in 2018 was

GRAPH 10.4.1

Housing starts, North America, 2009-2021

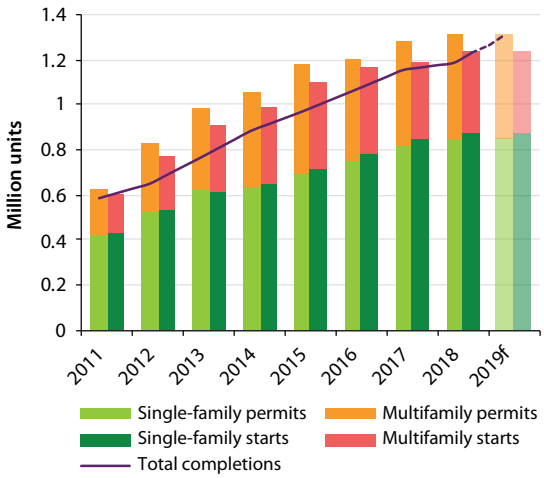


Notes: e = estimate; f = forecast.

Sources: CHMC, 2019; Mortgage Bankers Association, 2019; TD Bank, 2019; US Census Bureau, 2019a.

GRAPH 10.4.2

US housing permits, starts and completions, 2011-2019

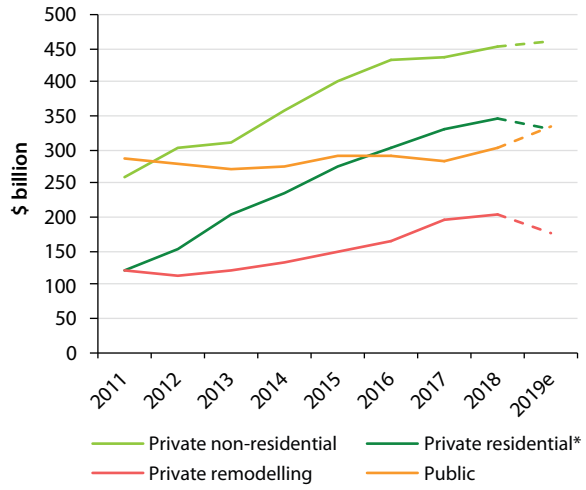


Notes: e = estimate; f = forecast; January-March 2019 data; seasonally annualized adjusted rate.

Sources: US Census Bureau, 2019a; MBA, 2019.

GRAPH 10.4.3

US construction spending, 2011-2019



Notes: *Private residential spending less remodelling expenditure (SAAR); nominal values and in millions; e = estimate (January-March 2019 data).

Source: US Census Bureau, 2019d.

almost unchanged from the previous year at roughly $385,000. The median size of completed new single-family houses decreased slightly in 2018, to 2,354 square feet (218.7 m^2), down from 2,385 square feet (221.6 m^2) in 2017. The mean size was 2,537 square feet (235.7 m^2), down from 2,599 square feet (241.4 m^2) in 2017 (US Census Bureau, 2019 b, c).

Sales of existing (i.e. previously owned) homes declined by 3.1% in 2018, to 5.340 million units (5.510 million units in 2017). The median existing-house sales price in April 2019 was $267,300, up by 3.6% from April 2018 ($257,900) (FRED, 2019c).

US total private residential construction spending (i.e. single-family + multifamily + remodelling) increased by 2.8% in 2018, to $539.8 billion. New single-family construction spending increased by 5.2%, to $284.3 billion; multifamily expenditure decreased by 0.3%, to $60.1 billion; and house renovation spending increased by 0.3%, to $195.4 billion (all SAAR; nominal US dollars) (graph 10.4.3) (US Census Bureau, 2019d). The Joint Center for Housing (2019) estimated that $326.2 billion was spent on remodelling in the US in 2018 and forecast this to rise to $347.3 billion in 2019 and $347.4 billion in 2020. Note that the estimates of the Joint Center for Housing and the US Census are calculated differently and thus values differ.

Private non-residential spending increased by 2.0% in the US in 2018, to $461.6 billion, and public expenditure grew by 10.6%, to $333.4 billion (US Census Bureau, 2019d) (graph 10.4.3).

Historically, US housing construction and sales have been a major component of US GDP. Before the housing crash and the global financial crisis, the contribution of housing to GDP averaged 17-19%; it was 14.9% in 2018, compared with 18.6% in 2005. Residential investment peaked in 2005 at 6.5% of total GDP and averaged 4.9% from 1963 to 2006. It was 3.2% of US GDP in the first quarter of 2019 (US Bureau of Economic Analysis, 2019 a, b, c), an indication that the new-housing construction sector has potential to expand.

10.4.2 US construction outlook

The common themes hindering the development of a robust US housing construction and sales market include a deficient inventory of new and existing houses for sale; a lack of available lots for new construction and, in some locations, of construction workers; regulatory burdens; a lack of builder financing; student-loan debts accrued from higher education; shifting attitudes towards house ownership; underemployment; and stagnant-to-declining median incomes. There remains a tendency for millennials (adults born in 1982 or later) to live with their parents. The number of household formations increased in 2018 but remains less than the historical average.

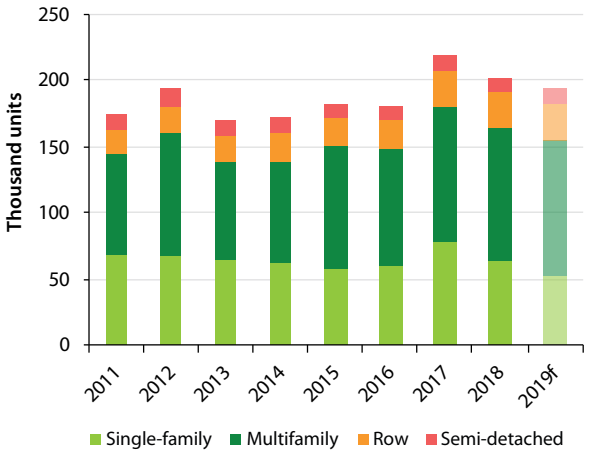
Looking forward, the Mortgage Bankers Association (MBA) (2019) projected that US single-family housing starts will total 0.92 million units in 2019 and increase to 0.99 million units in 2020 and 1.03 million units in 2021. Projections for starts are 1.31 million units in 2019, 1.38 million units in 2020 and 1.41 million units in 2021. MBA (2019) also forecast new single-family sales of 0.65 million units in 2018, 0.67 million units in 2019 and 0.70 million units in 2020. Sales of existing houses are projected at 5.56 million units in 2019, 5.77 million in 2020 and 5.93 million in 2021.

10.4.3 Canadian housing market

New-housing construction is steady in Canada, but there are increasing concerns. Both the International Monetary Fund (REP, 2019) and the Canada Mortgage and Housing Corporation (CHMC, 2019a) are concerned with rising risk

GRAPH 10.4.4

Housing starts, Canada, 2011-2019



Notes: f = forecast.

Sources: BMO, 2019: CMHC, 2019a; Scotia Bank, 2019; TD Bank, 2019.

in the Canadian housing market. The primary concerns are affordability, household debt, overbuilding in some provinces, and price acceleration. The nationwide mortgage guidelines, including the B-20 stress test (simply, "can a borrower afford an increased payment if mortgage rates rise in the future?"), have helped in stemming price acceleration but critics claim it has also hindered Canadian housing sales. Vecina (2019) reported that the mortgage volume decreased by C$13 to C$15 billion dollars between the first quarter of 2017 and the corresponding period in 2018 due to B-20 implementation.

Even so, the number of new Canadian housing starts is projected at 194,000 units in 2019 and 197,000 units in 2020 (averaged from BMO, 2019; RBC, 2019; Scotia Bank, 2018; TD Bank, 2019). TD Bank (2019) forecast 197,000 starts in 2021. Of starts in 2018, 63,490 were single-family detached; 27,146 were row-house; 11,373 were semidetached units; and 100,365 were multifamily (graph 10.4.4) (CMHC, 2019b). The number of housing sales was estimated at 457,600 units in 2018, and projections are for 450,400 units in 2019 and 459,400 units in 2020 (CREA, 2019).

10.5 Modular housing

Factory-built (also called modular or off-site) housing is not a new technique. In some ways, the Sears & Roebuck kit houses (Sears Archives, 2019) that were manufactured and sold from 1908 could be considered a forerunner to today's modular housing concept. The kits were marketed by catalogue and, when a purchase was made, the kit was shipped to the buyer.

Housing affordability and availability are problems in Europe and North America, with insufficient new buildings to meet population growth. To many observers, off-site manufacture might enable the building and sale of less-expensive housing units. Conceptually, modular houses can be built in shorter-time frames, and more houses could potentially be delivered to buyers. Thus, modular construction has promised to offer reduced project completion times and material costs, greater quality control, mitigation of labour shortages, improved safety and year-round manufacturing (Meyers, 2019).

Modular housing encompasses prefabricated houses (prefab), panelized components, and modular fabrication. According to Gonzalez (2018), "prefab" is the term for off-site, factory-built constructed houses. Panelized construction involves the fabrication, in a factory, of the house wall structure and roof trusses, which are then shipped to the site (in Europe, flooring is also panelized). Modular construction involves the manufacture of house components (e.g. "cartridge units, typically six-sided boxes") in a factory. Prefinished, self-contained structural units are constructed in the factory and then shipped to the site, where the various units are assembled into a house. There are modular associations and builders in Canada, Europe and the US.

Builder and consumer acceptance of off-site manufacturing is in its early stages in the US and established in Europe, as illustrated by expenditures and market shares. In 2016, US off-site expenditure was estimated at $3.3 billion, and this is forecast to grow by 39% by 2023, to $157 billion (Slowey *et al.*, 2019); some expect prefabricated home construction in the US to grow to match the level of developed European markets (The Charlotte Post, 2019).

A study by Roland Berger (2018), which encompassed Austria, Denmark, Germany, Norway, Poland, Sweden, Switzerland and the UK, indicated that 15% of 1+2 family housing units in Europe were prefabricated, and future growth was estimated at 3.2% per year through 2022. These countries rely primarily on timber-framed modular homes (around 74% of their total prefabricated construction in 2018). Projections suggest that timber will remain the primary framing material of prefabricated homes in all of these countries moving forward, with the exception of the UK who rely on alternative materials (Roland Berger, 2018).

Although modular construction is promising, there are uncertainties. Questions include: Is the demand for off-site modular construction robust? What are the limitations in design flexibility? Can efficient production methods be realized? Fisher and Ganz (2019) suggested that, unless significant cost savings can be achieved, contemporary off-site housing manufacture may repeat previous, failed attempts in the US. If such questions can be addressed, however, modular approaches could remedy housing underbuilding and concerns about affordability.

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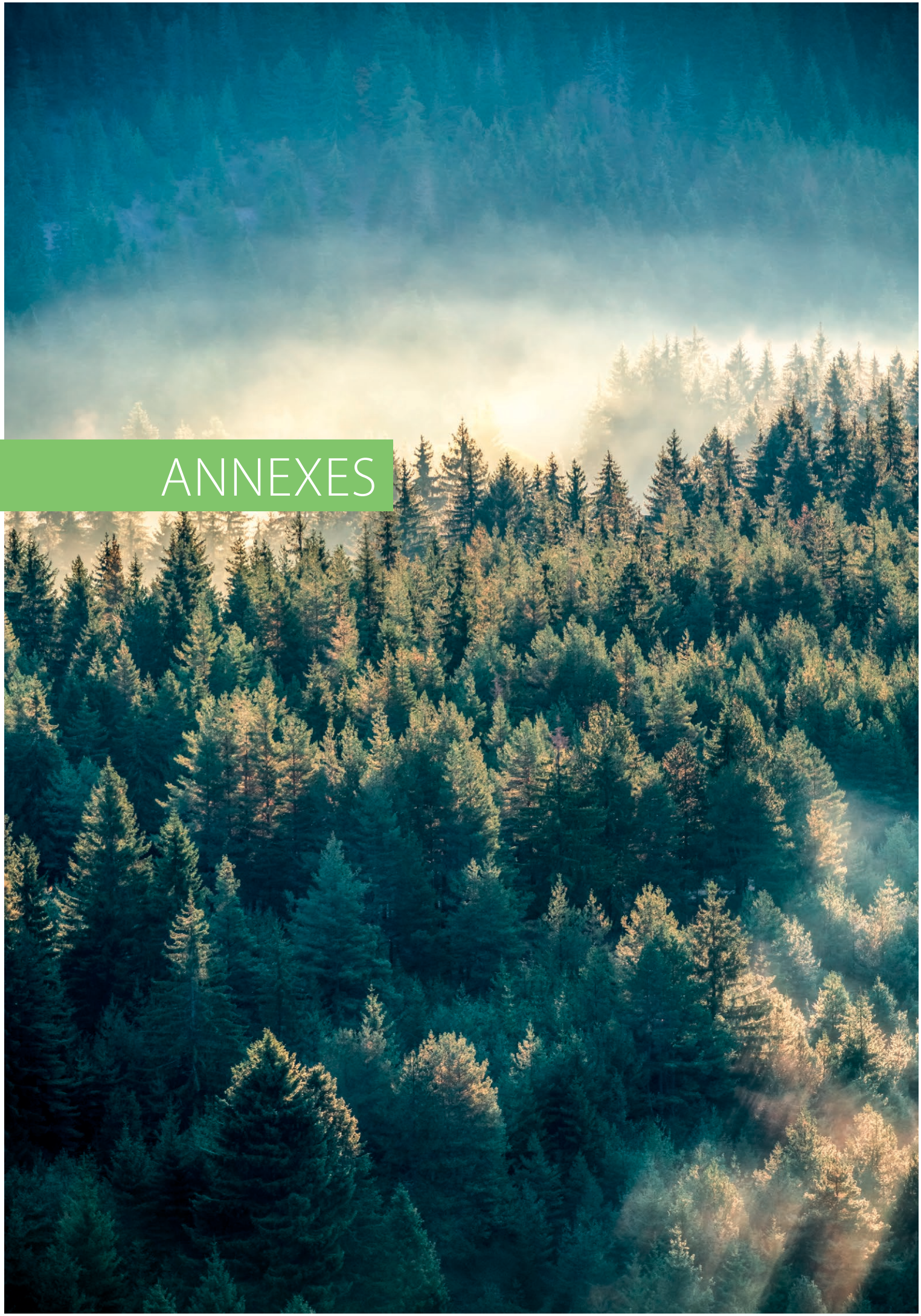
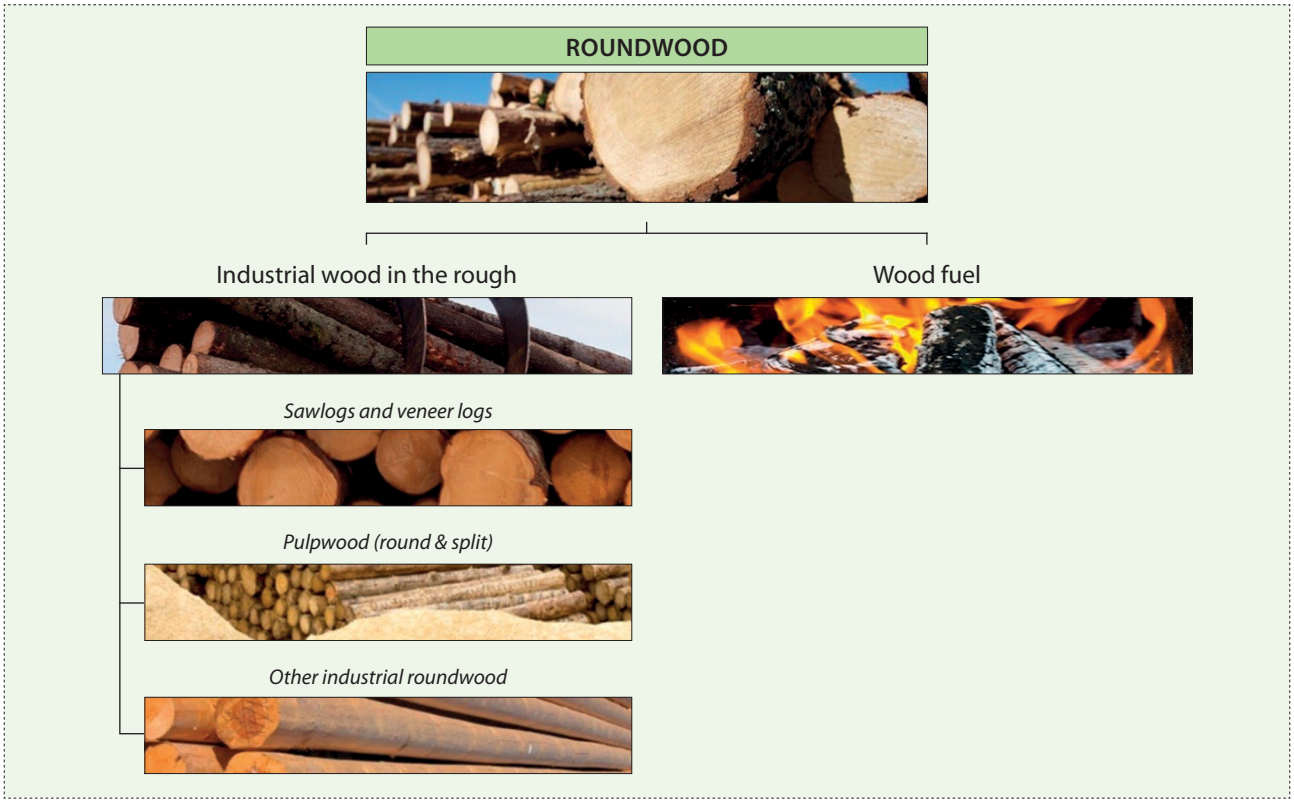
ANNEXES

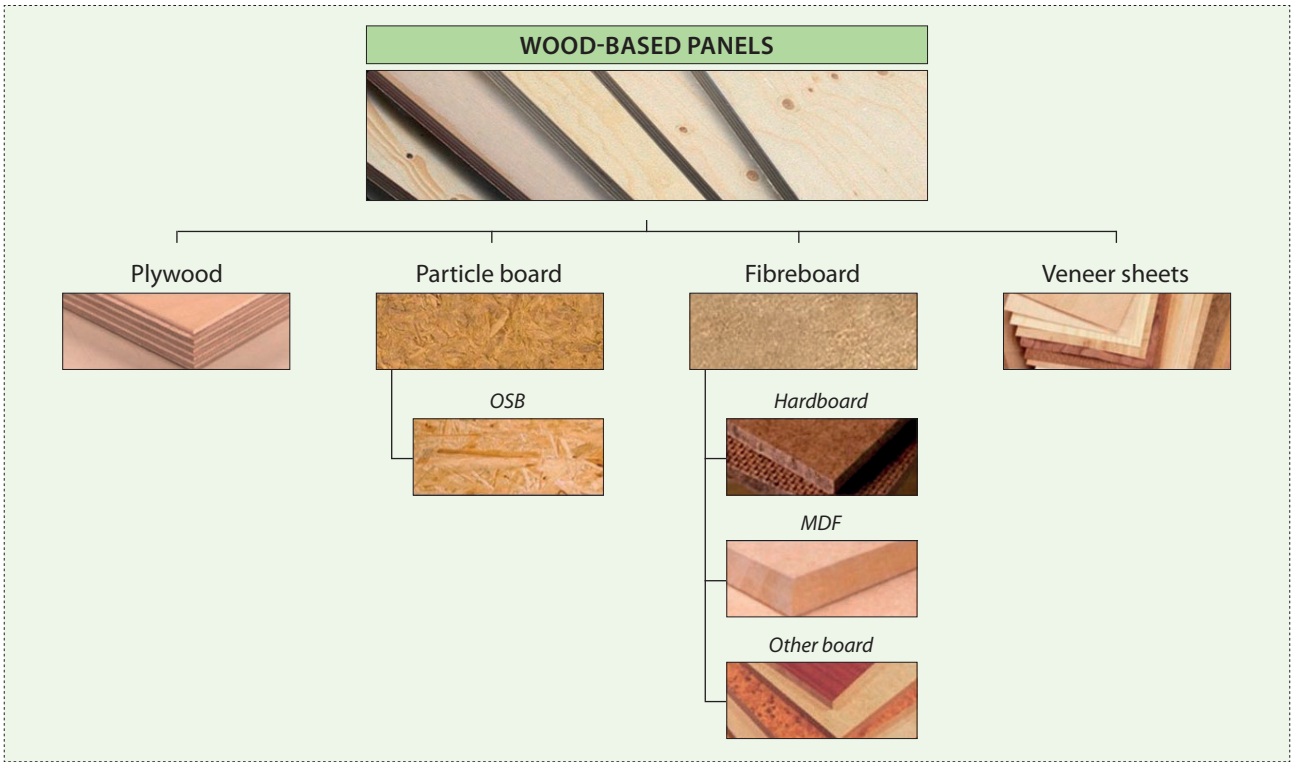


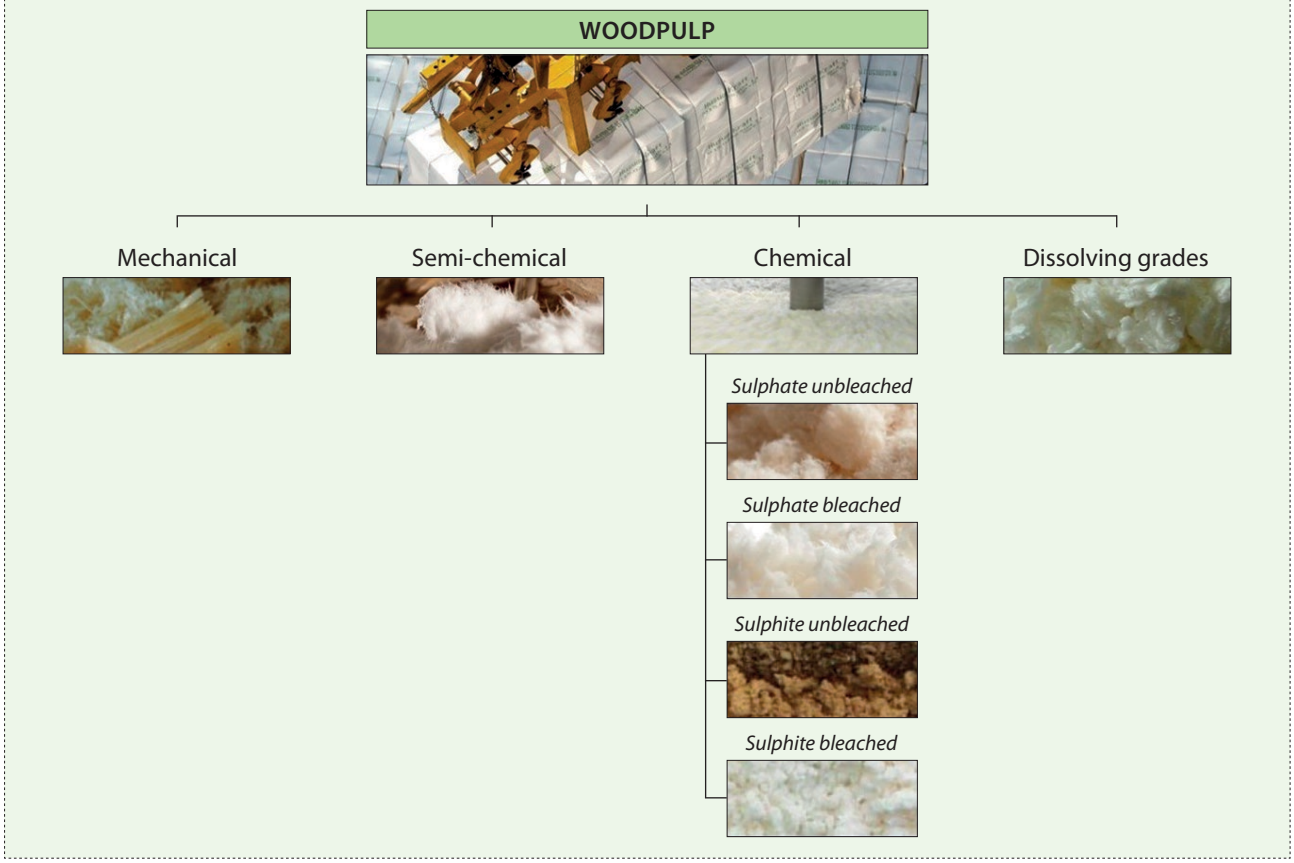
COMPONENTS OF WOOD PRODUCTS GROUPS

(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; veneer and plywood) are further divided into softwood or 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.

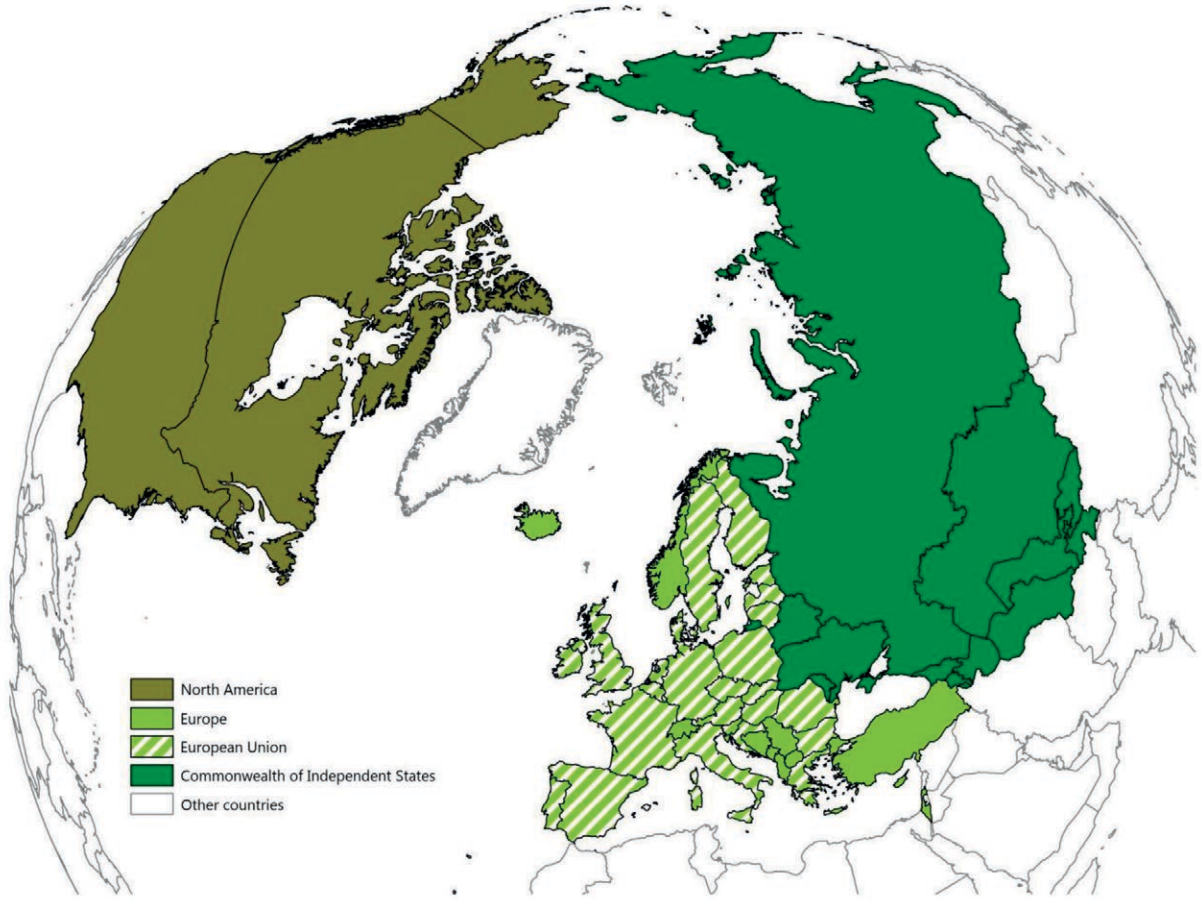






Sources for images in these diagrams are databanks of Metsä Group (2012), Raunion Saha (2012), Stora Enso (2012) and UPM (2012).

COUNTRIES IN THE UNECE REGION AND ITS SUBREGIONS



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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 the Food and Agriculture Organization of the United Nations (FAO) to provide a policy and technical forum for countries to discuss and address forest issues on a regional basis.

The purpose of EFC is to advise on the formulation of forest policy and to review and coordinate its implementation at the regional level; to exchange information; to advise on suitable practices and actions to address technical and economic problems (generally through special Subsidiary Bodies); and to 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 and the Working Party on Mediterranean forestry issues (Silva Mediterranea). It shares with the United Nations Economic Commission for Europe (UNECE) the ECE/FAO Working Party on Forest Statistics, Economics and Management.

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 Secretary 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 United Nations Economic Commission for Europe (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, the Commonwealth of Independent States, the United States of America, 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, and in particular with FAO (the Food and Agriculture Organization of the United Nations) and its European Forestry Commission, and with the International Labour Organization, in order to ensure complementarity and to 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
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Forest Products Annual Market Review 2018-2019

The *Forest Products Annual Market Review 2018-2019* provides a comprehensive analysis of markets in the United Nations Economic Commission for Europe (UNECE) region and reports on the main market influences outside the region. It covers a wide range of products from the forest to the end user - from roundwood and primary processed products to value-added, wood energy, and innovative wood products.

Statistics-based chapters of the *Review* analyse the markets for wood raw materials, sawn softwood, sawn hardwood, 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. Policies concerning forests and forest products are discussed, as well as the main drivers and trends. The *Review* also analyses the effects of the current economic situation on forest products 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 and objective information for other policymakers, researchers and investors.

Further information on forest products 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/fpamr2019.

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